Obesity Facts

Abstracts

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PLENARY LECTURES

Monday, 12 May 2025

PL1 - Integrative View: Metabolic Fuel Partitioning in Obesity

PL1

Fuel Partitioning and the Carbohydrate-Insulin Model of Obesity

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Conventional treatment for obesity, based on the first law of thermodynamics, assumes that all calories are alike, and that to lose weight one must ultimately "eat less and move more." However, this prescription rarely succeeds over the long term. Calorie restriction elicits predictable biological responses – including increased hunger and reduced energy expenditure – that oppose ongoing weight loss. Indeed, the prevailing 'energy balance model' offers no compelling explanation for what specific dietary factors have so profoundly altered the biological systems that control body weight, and the mechanism through which they operate. Why has average weight increased so rapidly among populations worldwide with stable genetic obesity risk?

The 'carbohydrate-insulin model' proposes the opposite causal direction. Overeating doesn't drive weight gain over the long term; instead, the process of storing excess body fat drives overeating. High intakes of processed carbohydrate elicit hormonal responses that shift substrate partitioning toward adipose tissue, leaving fewer calories for metabolically active and fuel sensing tissues. Consequently, hunger increases. and metabolic rate slows in the body's attempt to conserve energy. From this perspective, the conventional calorie-restricted, low-fat diet amounts to symptomatic treatment, destined to fail for most people because it does not target the underlying predisposition toward excess fat deposition. A dietary strategy aiming to lower insulin secretion – focused especially on the intake of processed carbohydrates – will increase the effectiveness of long-term weight management and chronic disease prevention.

PL2 - Digital Food Environments Driving Poor Diet in Adolescents: Strategies and Interventions

PL2

Digital Food Marketing and Adolescent Diets: Impact, Challenges, and Policy Interventions

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Food marketing of unhealthy products is one of the commercial determinants of health, shaping dietary behaviors through a hierarchy of sequential effects. Exposure to food marketing influences attitudes, increases purchases and consumption, and, over time, contributes to adverse health outcomes. The rise of digital media has transformed the marketing strategies of food companies, making digital marketing one of the most relevant components of their marketing mix. Adolescents are particularly vulnerable to the persuasive effects of digital food marketing due to their high engagement with digital media and neurodevelopmental factors that heighten sensitivity to rewards, reduce inhibitory control, and encourage risk-taking behaviors. While research in this area remains emergent, existing evidence already links exposure to digital food marketing with increased consumption of unhealthy foods among adolescents. This presentation will explore the nature and strategies of digital food marketing, the current evidence on its impact on adolescent eating habits, and its broader public health implications. Additionally, it will examine key challenges in regulating digital food marketing and discuss policy approaches aimed at protecting adolescents from the marketing of unhealthy foods and beverages in digital environments.

EASO SESSION

Sunday, 11 May 2025

ES1 - Teaching Workshop: EASO Behaviour, Psychology & Mental Health Working Group: The Current Understanding of Weight Bias, Obesity Stigma, and Strategies to Overcome Them

ES1.01

The State of Weight Stigma: Health Consequences, Intersections, and Interventions

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Weight bias, stigma, and discrimination, collectively characterized by the negative attitudes, stereotypes, and behaviours towards individuals with obesity, are highly prevalent public health and human rights issues. Many obesity scientific and patient associations worldwide prioritize these issues in their work, including the European Association for the Study of Obesity, the European Coalition for People Living with Obesity, Obesity Canada, and many others. Approximately 60% of adults engaged in weight management have experienced weight discrimination throughout their lives in various settings, especially in healthcare systems. Indeed, considerable research shows that healthcare professionals, public health professionals, and policymakers hold these negative attitudes, which creates barriers to patient engagement and access to treatment as well as influence healthcare policies and services for people living with obesity. Experiencing weight stigma is also associated with negative physical (e.g., increased cortisol,

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elevated blood pressure, risk of premature mortality), and psychosocial (e.g., depression, anxiety, social isolation, healthcare avoidance) health outcomes, independent of weight status. People with obesity may also have intersectional experiences of stigma and discrimination in relation to other sociodemographic characteristics (e.g., being part of a racially, ethnically, and socioeconomically marginalized group), living with a chronic illness associated with obesity (e.g., diabetes, MASLD, OSA), and/or for their obesity treatment choices (e.g., behavioural, pharmacotherapy, or bariatric surgery intervention). For instance, people who are Black, Indigenous, or People of Colour (BIPOC) are disproportionally affected by obesity. Furthermore, treatment options for managing obesity are often not accessible, not evidence-based, nor equitably distributed, resulting in considerable healthcare disparities and social and health inequities around the world. Moreover, while pharmacotherapy and bariatric surgery are more readily available, patients may be counseled less on these options due to pre-existing misconceptions that lack nuance and model obesity as merely a behavioural issue that should be resolved solely through diet and exercise. In fact, stigmatizing misconceptions about obesity undermine obesity treatment goals, underscoring the urgent need to reduce weight stigma both in healthcare and societally.

The objective of this first symposium presentation is to provide an overview of the significant impacts of experiencing weight bias and stigma for people living with obesity; as well as the emerging science on the intersectionality of stigma across sociodemographic characteristics, obesity-associated chronic conditions and treatment options. This session will begin with a patient advocate who has lived with obesity, representing the European Coalition for People Living with Obesity (ECPO) (Vicki Mooney, Spain), followed by an evidence-based presentation from two weight stigma researchers (Dr. Angela Alberga, Canada and Dr. Angela C Incollingo Rodriguez, USA).

ES1.02

A summary of recent educational initiatives to prevent weight bias in healthcare by Obesity Canada's Education Action Team

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Introduction: Weight bias, defined as social misconceptions and stereotypes associated with larger bodies or obesity, is frequently reported in healthcare settings. To improve delivery of patient-centred obesity care, it is necessary to educate healthcare professionals on recognizing and preventing weight bias. Obesity Canada's Education Action Team was established to inform obesity-related medical curriculum and education initiatives. An objective of the team was to ensure the patient voice is represented and key topics and strategies addressing weight bias prevention in healthcare are included in educational tools and resources. This research presentation summarizes two recent initiatives from the Education Action Team including the development of medical competencies for obesity management integrating weight bias prevention, and an evaluation of an online patient-informed course (Calibre) that includes weight bias education and prevention strategies.

Methods: A team of seventeen health professionals, educators, and patients with lived experience of obesity participated in an iterative group consensus process following the 2015 CanMEDS competency framework, to develop a set of key obesity medical education competencies and enabling competencies. Calibre is a seven-week virtual interactive course for any healthcare professional on respectful management of obesity. Calibre was developed in collaboration with healthcare professionals and patients who have obesity. At the end of the course, participants provide open-ended anonymous online feedback on their commitment to change practice and specifically what they intend to do. The key and enabling medical competencies and how weight bias has been integrated was summarized. Responses post completion of Calibre were assessed and summarized by applying a conventional content analysis.

Results: Across the 13 key competencies developed, each includes at least one enabling competency that addresses prevention of weight bias in healthcare provision (e.g., Key Competency #1: Apply medical knowledge and professional values to the provision of patient centered obesity care; Enabling Competency 1.2: Demonstrate awareness of one's own personal weight bias and stigma in relation to obesity care); this means that in order to successfully demonstrate each medical competency for obesity management, healthcare professionals must understand, recognize and actively contribute to prevention of weight bias. 216 healthcare professionals completed Calibre and 100% committed to make a practice change. Content analysis results showed that majority felt the change they can make will be to improve their delivery of patient-centred obesity care (e.g., asking permission before discussing weight) and engaging in self-reflection to recognize their own weight biases.

Conclusion: Having patient and expert informed enabling competencies for obesity management that address weight bias may be an integral part of mitigating weight bias in healthcare. Additionally, resources like Calibre, can offer continuing education opportunities on weight bias and facilitate improvements in the delivery of patient-centred obesity care.

ES1.03

Ongoing Work to Eliminate Weight Bias and Stigma as an Overarching Goal of the U.S. Obesity Care Advocacy Network

Kyle, T. K.

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Eliminating weight bias and obesity stigma is a fundamental goal of the U.S. Obesity Care Advocacy Network (OCAN). This is because weight bias and stigma prevent progress in overcoming obesity through better access to care, higher standards for care, innovation, and prevention. Policymakers rely upon presumptions about biased mental models for the chronic disease of obesity, informed by an incomplete understanding of its causes and implicit blame for the people who live with it. The result is limited access to effective obesity care and a reliance upon prevention strategies that have had no evident effect on disease prevalence. We will review how weight bias and stigma have prevented progress in overcoming obesity, share U.S. initiatives designed to reduce weight bias and stigma, and share evidence of progress. Finally, we will offer an outline of important work that remains to be done in order to achieve the goals OCAN.

ES1.04

Results of the International Weight Bias Summit: Establishing Future Research Directions in the Field

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Introduction: Weight bias is a social justice issue that manifests in social and health inequities affecting the lives of millions of individuals globally. Although weight bias research has increased in the last two decades, its pervasiveness remains, and more work is needed to identify effective strategies to reduce weight bias and improve the quality of life of people living with overweight and obesity. The 2024 International Weight Bias Summit was therefore set to identify key research gaps in the field of weight bias, and the barriers to addressing them, with the goal of reaching consensus on directions for future research in the field to prioritize.
Method: Experts in weight bias (N=33 researchers, clinicians, representatives of professional/national organizations, and individuals with lived experiences) from across North and Latin America, Europe, and Australia attended a two-day summit to establish the necessary directions to advance the field of weight bias research. Attendees briefly presented their research to provide an overview of the ongoing international weight bias-related research. Following the presentations, attendees participated in semi-structured discussion sessions (in groups of 4-5 people) using the Nominal Group Technique, which focused on identifying current research gaps and barriers in weight bias research and determining meaningful research directions to prioritize. Notes were collected from all discussion sessions and later thematically analyzed by four coders. This analysis identified the most prominent research directions that emerged from the Summit.
Results: Six key research directions were identified to advance the field of weight bias: 1) Policy (i.e., understanding the effects of changing/implementing policies to prevent weight discrimination); 2) Methodology and Conceptual Clarity (i.e., conducting longitudinal research with more rigorous methods and providing consensus on definitions of terms in the field); 3) Consequences of Weight Bias (i.e., understanding consequences of weight bias on physiology, psychology, and health behaviours overtime); 4) Interventions (i.e., prevention in early childhood and reduction among early career health professionals); 5) Implementation Science (i.e., implementing evidence-based research into practice); and 6) Diversity in Sampling, Cultures, and Settings (i.e., improving knowledge of weight bias across different populations, cultures, and contexts/settings). Key barriers were also identified in the research field of weight bias, including insufficient funding mechanisms, lack of knowledge translation, and limited international research collaborations.
Conclusion: According to weight bias experts, there are critical research directions that should be addressed and prioritized to advance the field of weight bias globally and incorporated into funding strategies worldwide to drive meaningful progress. An initial step towards these goals is establishing an International Weight Bias Research Network to foster growth, collaboration, and improved knowledge translation toward a shared goal of mitigating weight bias globally.

ES2 - EASO Childhood Obesity Working Group: Exploring the Big Questions in Childhood Obesity

ES2.01

Obesity and the adolescent brain

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Adolescence is a transformative period marked by rapid development of brain, behavior and body. Cognitive neuroscience studies using neuroimaging techniques have revealed profound structural and functional changes through adolescence across cortical and subcortical networks. These changes are crucial to the development of behaviors including reward processing and cognitive control. More recently, obesity scientists have harnessed similar methods to illuminate brain circuits relevant to eating behavior and body weight through development. These studies use Magnetic Resonance Imaging [MRI] to examine neural responses to seeing and consuming food, functional connectivity of brain appetite circuits at rest, measures of brain structure including regional brain volumes and markers of pathological processes such as hypothalamic gliosis, and measures of the neurochemical composition of brain tissue. By using these methods, we are learning more about individual differences in the structure and function of brain appetite circuits, and the role of these circuits in the effect of obesity interventions on body weight. Together, these new findings illustrate the complexity and plasticity of brain appetite circuits through development. They also demonstrate the promise of combining neuroimaging insights with those gleaned from other scientific approaches to inform obesity prevention and treatment, and maximize the impact of obesity science on public health.

ES2.02

Is Physical Activity the Overlooked Key in Tackling Pediatric Obesity?

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Pediatric obesity is a pressing global health issue, closely linked to adverse cardiometabolic outcomes and alterations in fat distribution. While dietary interventions remain a primary focus in obesity management, the role of physical activity in modulating cardiometabolic health and ectopic fat deposition is often overlooked. This talk will present new findings on the impact of exercise on key cardiometabolic markers, including insulin sensitivity, lipid profile, and inflammation, alongside its effects on specific fat depots such as visceral fat, subcutaneous fat, intermuscular fat, and pancreatic fat. By examining how structured and habitual physical activity influences these parameters, we will highlight the potential of exercise as a fundamental tool in pediatric obesity prevention and treatment. Additionally, we will discuss challenges in promoting physical activity among children and adolescents and the need for integrated, multidisciplinary approaches to enhance its effectiveness.

ES2.03

Should children take the lead in their treatment? Strategies for effective involvement

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The question of how and when children should be actively engaged in their own obesity treatment is both ethically and practically complex. While healthcare guidelines advocate for child participation in medical decision-making, the extent to which they should independently steer their treatment remains debatable. Rather than assuming full responsibility, children's involvement should be carefully calibrated to their developmental stage, ensuring that they are supported rather than burdened by the management process. This presentation will critically examine strategies for meaningful, age-appropriate engagement in pediatric obesity care, balancing autonomy with structured parental and professional guidance. Early in life, parents are the primary agents of change, yet they often struggle with how—or even whether—to discuss weight-related concerns with their children. Many fear that such discussions could inadvertently foster body dissatisfaction or reinforce weight stigma. As children mature, their role in treatment expands, yet the degree of autonomy they assume varies across different treatment modalities. In family-based interventions, parental support remains central, while settings such as obesity management camps, inpatient programs, and digital health solutions place greater emphasis on adolescent self-regulation, decision-making capacity, and

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the ability to navigate peer influences. The emergence of pharmacological treatments and bariatric surgery further raises critical questions about adolescents' readiness to engage in long-term treatment decisions and the extent to which responsibility should be shared with caregivers and healthcare providers. This talk will explore the fine balance between fostering engagement and safeguarding psychological well-being, while also addressing the broader societal and clinical contexts in which these discussions occur. By interrogating the intersection of child agency, parental responsibility, and the pervasive impact of weight stigma, we can develop more sensitive, developmentally appropriate, and stigma-free approaches to obesity management in children and adolescents.

ES3 - Teaching Workshop: EASO Obesity Management Working Group/Primary Care Diabetes Europe

ES3

Ultrasound Epicardial fat as a routine anthropometric measurement in patients living with Obesity

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Introduction: Epicardial fat has been linked with increased cardiovascular risk in patients living with Obesity. CT and MNR have been the most used imaging techniques. Ultrasound (US) assessment is arising as a low-cost, non-radiating, reproducible methodology in Obesity body composition analysis. Our aim was to describe epicardial fat in larger "real-life" cohorts and assess its correlation with visceral fat distribution and metabolic biochemical markers.
Methods: We performed US (Vivid 8, GEHealthcare®) Epicardial fat as a complementary measure to standardized body composition procedures (Lunar Prodigy DXA, GEHealthcare®) to 301 consecutive patients who came to our Obesity Unit. Parasternal long axis, parasternal short axis and posterior cardiac recess were measured to assess Epicardial fat together with FEVI as heart failure marker. Severity of Epicardial fat thickness was defined as: <5mm normal; 5-7 mm mild; 7-10mm moderate; >10 mm severe. Cutt-off for abnormal visceral fat was >20% of abdominal fat. Apendicular lean mass index was used to assess myopenia. Patients were classified according to Metabolic syndrome comorbidities. Blood tests for glucose/insulin (HOMA), HbA1c, HDL/LDL, triglycerides and CRP were also recorded. Anova, multivariate and pearson's "r" correlation tests were used for the statistical analysis (SPSS v19.0).
Results: n=103. Mean age: 54,5±12,4 y.o (17-79). 74,5% women (w) and 25,5% men (m). Mean BMI: 35,2 ±6,25 Kg/m2. Waist: 103,08 ±8,03 cm (w) and 113,4 ± 10,2 cm (m). 14,7% were diagnosed as Type2 DM; 25,5% dyslipidemia (DL) and 29,4% had hypertension (HT). Total body fat: 48,13±4,51% (w) and 40,16±6,85 % (m); Abdominal Fat: 53,34±5,57% (w) and 47,76±10,52% (m); Visceral Fat content: 37,83±11,41 (w) 58,05±17,19 (m). Only 2 patients showed low apendicular lean mass index. Visceral fat correlates with glucose, HbA1c, insulinemia, HOMA and Triglycerides ($p<0,05$). Mean parasternal long axis was 7,72±1,72 mm; Mean parasternal short axis 8,21±2,08 mm and mean posterior cardiac recess: 8,31±1,79 mm. Only 2 patients had normal epicardial fat thickness; 14,7% had mild; 33,3% moderate and 42,2% severe epicardial fat thickness. FEVI was normal in all subjects (mean 68,58±6,11%) and did not show any correlation with epicardial thickness. Epicardial fat (Both parasternal long and short axis) correlates with visceral fat in DL (r=0,6) and HT (r=0,51) subgroups (p=0,01). Glucose correlates with epicardial fat (all 3 parasternal and posterior cardiac recess measures) in HT (r2=0,32 p=0,003) and DL subgroups (r2 0,32 p=0,007). Total cholesterol also correlates with epicardial thickness using parasternal long axis.
Conclusions: In a large postmenopausal women cohort with marked visceral obesity, 42% showed severe epicardial fat thickness. This huge prevalence had never been pointed out before. Epicardial fat (Both parasternal long and short axis measures) correlates with visceral fat in all Type2DM, DL and HT subgroups. Glucose (marker of insulin-resistance) could explain the link between epicardial and visceral fat depots. Epicardial ultrasound measurement should be routinely done in the study of patients living with Obesity.

ES4 - Teaching Workshop: EASO Nutrition Working Group/EFAD

ES4.01

Medical nutrition therapy, obesity and dementia

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Introduction: Obesity is increasingly being recognized as a significant risk factor for the development of dementia. The population of older adults with obesity is experiencing rapid and substantial growth. Research indicates that individuals with obesity in midlife are at a higher risk of developing dementia later in life. The association between obesity and dementia is thought to involve several mechanisms including insulin resistance, inflammation, and cardiovascular issues, all of which can negatively affect brain health. Medical nutrition therapy plays a crucial role in both obesity treatment and supporting cognitive health.
Methods: This review examines approaches to medical nutrition therapy, obesity management, and dementia risk reduction. The results are proposed to be presented at the Teaching Workshop: EASO Nutrition Working Group/EFAD at the 32nd European Congress on Obesity, ECO2025, in Malaga, Spain.
Results: Dietitians can employ various approaches in medical nutrition therapy to assist patients in reducing obesity-related dementia risk. Promoting an eating pattern rich in fruits, vegetables, whole grains, lean proteins, and healthy fats—such as those found in fish, nuts, and olive oil—dietitians can help people with obesity maintain a healthier weight while nourishing the brain. A well-balanced diet supports metabolic health, reduces inflammation, and may help prevent conditions like diabetes, which is also associated with an increased risk of dementia. Adopting a comprehensive approach that combines a heathier eating pattern and physical activity with other lifestyle factors, including stress management, cognitive stimulation, and social interaction, provides a multifaceted strategy for treatment of obesity and prevention of dementia. Moreover, the efficacy of medical nutrition therapy and lifestyle interventions may be influenced by individual variations in genetics and overall health. Consequently, it is beneficial for people with obesity when dietitians collaborate in multidisciplinary teams to develop personalized treatment plans that address nutrition, physical and psychological well-being. It is important for dietitians to be aware of obesity stigma and weight bias when providing medical nutrition therapy to their patients.
Conclusion: Medical nutrition therapy that promotes balanced nutrition and lifestyle modifications may play an important role in reducing the risk of dementia in people living with obesity. Supporting patients in managing their chronic, complex, and relapsing disease in the long term is also crucial for medical nutrition therapy. Dietitians must be responsive to their patients' individual needs and circumstances in a non-stigmatizing way.

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ES4.02

The First and Next 1000 Days: A Crucial Window of Opportunity for Healthy Growth and Development

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Nurturing care during the first 1000 days (gestation through 2 years of age) followed by the "next 1000 days" (>2-5 years) is the foundation for healthy growth and development with long-lasting consequences for human and planetary health, and national development. During gestation the process of neurogenesis is massively activated. Healthy newborns are delivered with about 250 billion neurons, and they are born with the capacity to establishing the trillions of synapses required to develop the motor and learning skills needed for their social, psycho emotional, and cognitive development. Synaptogenesis occurs when children receive stimulation by exploring and learning from their environments and it never occurs as rapidly as during the first years of life (about 1500 synapses are formed per second during the first 3 years of life). Obesity and chronic diseases risks can be transmitted from one generation to the next and the risks gest "programmed" through epigenetic mechanism since gestation and during early childhood, also a key the window of time for the development of healthy food preferences. This is why developing equitable policies for investing in family-centered well-coordinated intersectoral nurturing care for child development scaled up programs that are effective and sustainable needs to be a global priority. These intersectoral programs must include health care, nutrition (including food and nutrition security policies and programs), responsive parenting (including responsive feeding), protection, and early stimulation and learning opportunities since gestation and for at least the first five years after birth. Preconceptional nutrition, including during the pre-adolescent and adolescent periods, also needs to be a key component of national childhood obesity and chronic diseases prevention policies and programs.

ES4.03

Successful childhood obesity programmes in Europe

Moreno Aznar, L. A.

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Obesity in children and adolescents has been increasing in the last decades, reaching unacceptable prevalence rates. Public health actions seem to start to be effective in some countries. However, more efforts are necessary to achieve the WHO goal of ending with the childhood obesity epidemic. Available evidence concludes the different types on interventions already implemented, have moderate effect in body composition indices, i.e. the body mass index (BMI). Interventions use to be effective in relation with the targeted behaviours, especially fruits intake and sedentary behaviours. Interventions combining different nutrition and physical activity related behaviours are more effective than those targeting isolated behaviours. Ideally, interventions should focus not only in children, but also in the families, the school and the community. The school is an appropriate setting in this population group, as children spend a significant part of their time taking lessons and participating in other school-related activities. Community activities seem to add to what is achieved with the other intervention components.

The main limitation of the studies on childhood obesity prevention is the lack of proper assessment of the process of the intervention and its relationship with the obtained efficacy. Different aspects related with the intervention context should be considered, such as contextual factors that shape theories of how the intervention works, contextual factors that affect implementation, intervention mechanisms and outcomes and causal mechanisms present within the context which act to sustain the status quo, or potentiate effects. The implementation process as how delivery is achieved, training, resources etc. should be considered as well as what is delivered, specifically its fidelity, dose, adaptations and reach. Mechanisms of impact such as participant responses to and interactions with the intervention, mediators and potential unexpected pathways and consequences should be also considered.

Innovative strategies are also promising for future intervention programs. They include social marketing approaches, the use of social networks in order to disseminate health related messages and to take profit of the peers influence, and the use of active games. Future studies should incorporate these promising approaches in order to develop the most effective strategies to tackle the childhood obesity epidemic.

ES4.04

Preventing obesity and sarcopenic obesity in older adults

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The prevalence of obesity in older people is steadily increasing and represents a growing health challenge. Changes in body composition across the lifespan include increases in body fat and decreases in body water. In older persons, the increase in adiposity that defines obesity often overlaps with a decline in skeletal muscle mass and function, a condition known as sarcopenia. This convergence of obesity and sarcopenia, termed sarcopenic obesity, is a significant clinical phenomenon with multiple implications for health outcomes.

Several factors contribute to the development of sarcopenic obesity, including metabolic changes associated with sedentary lifestyles, established dietary patterns, adipose tissue dysregulation, inflammatory processes, hormonal changes, acute and chronic diseases, and the ageing process. Despite their interrelationship, prevailing definitions of obesity and sarcopenia have historically overlooked the concept of sarcopenic obesity. However, in recognition of its clinical importance, a collaborative effort between ESPEN and EASO culminated in the establishment of consensus criteria for defining and diagnosing sarcopenic obesity in 2022. In parallel, the definitions of sarcopenia are evolving, with a recent global consensus on the definition of sarcopenia published by the GLIS initiative. The need for effective lifelong prevention and treatment strategies for sarcopenia and sarcopenic obesity is underscored by its profound impact on health outcomes. Currently, interventions to prevent obesity in older people, particularly those at risk of sarcopenia, require a holistic approach that prioritises muscle function and functional outcomes. This includes the integration of resistance exercise alongside dietary interventions and other therapeutic modalities. However, long-term habit change is not easy to achieve and requires of psychological expertise in the design of public health or individual-based programmes.

Nevertheless, further research is essential to elucidate the pathophysiology of sarcopenic obesity, to validate the utility of the recently proposed definition for prognostication and clinical decision making, and to identify optimal preventive and therapeutic interventions aimed at preserving function and ameliorating the metabolic and cardiovascular sequelae associated with obesity in older persons.

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ES5 - Teaching Workshop: EASO Physical Activity, Fitness and Function Working Group

ES5

Introduction on the definition, physiology and energy metabolism of sedentary behaviour

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Physical inactivity, i.e., not reaching the recommended level of physical activity, and sedentary behaviors, i.e., sitting time, have been associated with increased risk for common metabolic diseases and early mortality. Recent epidemiological data suggest that high volumes of sedentary

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behaviors are detrimental to metabolic health, even in the presence of regular exercise, i.e., moderate to vigorous physical activity (MVPA). This suggests that the health effects of sedentary behaviors are independent of those of exercise.
In this talk, I will define the terms sedentary behavior and physical inactivity and present data from epidemiological and experimental studies to better understand the physiology of physical inactivity and sedentary behaviors, with a special focus on energy metabolism. I will also present data from human clinical research studies that tested interventions to offset the adverse metabolic health effects of sedentary behaviors.

Monday, 12 May 2025

ES6 - EASO Sarcopenic Obesity & Obesity in Older Adults (SO3A) Working Group

ES6

Optimal Protein Intake to Preserve Lean Mass During Treatment with Obesity Management Medications

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The management of obesity has evolved significantly in recent years, with the advent of highly effective pharmacological treatments such as GLP-1 receptor agonists, SGLT2 inhibitors, and other weight-loss medications. While these therapies have shown remarkable success in reducing body weight and improving metabolic health, they also raise important questions about body composition, particularly the preservation of lean muscle mass during weight loss. Loss of lean mass during weight loss can lead to a decline in basal metabolic rate, which could make long-term weight management more challenging. The main concern when monitoring weight loss-induced changes in body composition is ensuring maintained or improved muscle health. Preserving muscle mass during weight loss is essential for maintaining a high quality of life and preventing reductions in strength, mobility, and metabolic health and preventing sarcopenic obesity development.
Protein intake plays a central role in maintaining lean mass and skeletal muscle mass. However, convincing evidence of protein requirements in obesity and during weight loss are scarce. Following bariatric surgery, for which the induced weight loss achieved magnitudes closed to the one obtained with pharmacological treatments, a few studies have shown an increase in dietary protein needs 12 months after the surgery. Achieving more than 1.0 g/kg per day of dietary protein to preserve fat free mass during weight loss is supported by the literature on non-surgical weight loss in adults and is likely a target protein intake level than for most patients with obesity management medications. Determining the optimal protein intake for preserving lean mass during pharmacological treatment requires careful consideration of several factors, including body weight, age, physical activity level, and also the timing and source of dietary proteins. In addition, during weight loss the decrease in energy expenditure due mainly to the loss of fat free mass should also be integrated in the definition of recommended protein intake in this population.
This conference will explore the role of optimal protein intake in maintaining lean mass during treatment with obesity management medications. Specifically, it will examine the effects of various medications on body composition, the significance of protein in preserving lean mass during weight loss, and recommendations for dietary protein intake in individuals undergoing weight loss interventions.

JOINT SESSION

Monday, 12 May 2025

JS1 - Joint Session: The WHO Acceleration Plan to stop Obesity: a global initiative to address the obesity pandemic. From the endorsement at WHA 75 in 2022 to a practical roll out in 34 countries

JS1

The WHO Acceleration Plan to stop Obesity: a global initiative to address the obesity pandemic

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In 2022, 37 million children under the age of five1 and 2.5 billion adults (18 years and older) were overweight. Of these adults, 890 million were living with obesity. To make matters even more pressing, the earlier prediction made that over one billion people live with obesity by 20303 has already been surpassed. The health risks caused by overweight, and obesity are increasingly well-documented and understood. In 2019, higher-than-optimal BMI caused an estimated 5 million deaths from non-communicable diseases (NCDs) such as cardiovascular diseases, diabetes, cancers, neurological disorders, chronic respiratory diseases, and digestive disorders. This combination of fast-rising prevalence and significance as a risk factor for other NCDs means that obesity now represents one of the major public health challenges of our time. If nothing is done, the global costs of overweight and obesity are predicted to reach US$ 3 trillion per year by 2030 and more than US$ 18 trillion by 2060, affecting upper-middle-income and higher-income countries the most.
At the 75th World Health Assembly in 2022, Member States adopted new recommendations for the prevention and management of obesity and endorsed the WHO Acceleration Plan to Stop Obesity. With UNICEF among its key partners, it is designed to stimulate and support multisectoral country action across the globe. Drawing on policies that are already tried and tested and based on implementation and delivery science, the plan offers the prospect of a step change in delivery and impact in the efforts to tackle the growing crisis of obesity.
As part of the acceleration plan, WHO recommends comprehensive policies to transform health systems to prevent, care and treat obesity across the life course; protect people from the harmful impact of food marketing; nutrition labelling policies; fiscal policies; physical activity; as well as school food and nutrition policies.
With the expected mixed results across and within the 34 frontrunner countries, incremental progress in the last three year had been observed, monitored, and brough up to speed. WHO across the three levels, in collaboration with partners and stakeholders and with the frontrunner countries in the lead, is supporting an implementation platform and a community of practice to progressively accelerate and expand the response to the global obesity pandemic.
This event aims to highlight the need to accelerate the global response to the obesity epidemic and increase the commitment across all levels of society to combat this major public health challenge.

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Objectives: To celebrate the three-year mark of the WHO Acceleration Plan to Stop Obesity and the progress in countries through analysis of successes and challenges.
To present novel evidence and approaches on the burden of obesity and ways to address it
To generate commitments to catalyse and amplify the WHO Acceleration Plan to Stop Obesity platform to drive a global response.

JS2 - Joint Session: CIBERobn Symposium: Nutrition vs. lifestyle interventions in obesity

JS2.01

Environmental sustainability, food and lifestyle sustainability, and non-communicable diseases

Bouzas Velasco, C.

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Sustainable development is crucial to ensuring a healthy environment, which is fundamental for human well-being. Unsustainable human activity has led to climate change, which includes global temperature rise, extreme weather events, and the melting of polar ice caps. These changes affect food security and livelihoods. Since 1992, the United Nations Framework Convention on Climate Change has worked to stabilize greenhouse gas concentrations. The Kyoto Protocol and the Paris Agreement are key efforts to reduce these emissions. The UN's 2030 Agenda, with its Sustainable Development Goals, aims to address economic, social, and environmental challenges for global sustainable development.
Food sustainability ensures access to nutritious food without compromising resources for future generations. Sustainable diets are respectful of biodiversity and ecosystems and optimize natural and human resources. Food production has several stages, each with an environmental impact, with the initial stages being the most influential.
Recent changes in eating habits, such as urbanization and globalization, have led to increased consumption of processed foods, which has raised diet-related diseases. A healthy and sustainable diet, including more plant-based foods and fewer animal products, can improve both human health and the planet's health.
The Mediterranean Diet, known for its cardiovascular and metabolic health benefits, is also environmentally sustainable. Studies like PREDIMED-PLUS have shown that greater adherence to this diet reduces CO2 emissions and other environmental impacts. Additionally, a more plant-rich diet within the Mediterranean framework has even more positive effects.
The severity of metabolic syndrome and other health parameters, such as abdominal obesity, are related to higher CO2 emissions. Actions aimed at reducing body weight and improving metabolic health have also been shown to decrease these gas emissions. Furthermore, lower intake of ultra-processed foods and sugary drinks contributes to environmental sustainability.
Conclusions: Reducing the consumption of ultra-processed products, opting for local and seasonal foods, and choosing water as the main beverage are measures that have proven effective in reducing the environmental impact of our diet. The Mediterranean Diet is a dietary model that protects the environment and improves health. Adopting a healthy and sustainable diet offers benefits for both human health and the environment. Integrating this knowledge into our lives is essential to achieving a balance between modern convenience and beneficial traditional practices.

JS2.02

Efficacy of a digital intervention for the promotion of healthy lifestyles in populations living with overweight and obesity

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Introduction: Unhealthy lifestyles are key determinants in the development and maintenance of obesity. Internet-based interventions are presented as effective and accessible tools to implement evidence-based programmes focused on promoting healthy behaviours. The 'Living Better' programme (LBP) is a nine-module, self-administered online intervention that integrates tools to facilitate sustainable lifestyle changes. This program has been implemented in populations with overweight and hypertension, and its efficacy has been evaluated, including the influence of the "own doctor" component. In this feature, participants' own doctors appeared in audiovisual content, encouraging adherence to the program through recorded messages. During the COVID-19 pandemic, a reintervention was conducted to assess the program's effectiveness under challenging circumstances. The goal of this presentation is to provide an overview of the program and share the data we have gathered to date with follow-ups of up to 3 years.
Methods: Three studies have been conducted as randomized controlled trials. Participants diagnosed with hypertension and overweight were assigned to either an intervention group (LBP), or a control group, which received usual treatment. Anthropometric measures (e.g., BMI, waist circumference) and psychological variables (e.g., quality of life, eating styles) were assessed at baseline, post-intervention, and during follow-ups at 6, 12, and 36 months. The primary study evaluated the program's efficacy in improving anthropometric, psychological, and behavioral variables. The second study examined the impact of the "own doctor" component, assessing whether the inclusion of participants' own doctors in audiovisual content enhanced adherence and engagement with the program. The third study focused on the reintervention conducted during the COVID-19 pandemic, evaluating its effects on a subset of participants.
Results: In the primary study, LBP demonstrated significant improvements compared to the control group in BMI, waist circumference, body fat mass, and blood glucose levels after three months, with moderate to large effect sizes. Psychological variables also showed significant improvements. These changes were sustained in the follow-ups. Regarding the inclusion of the "own doctor" component, it positively influenced adherence to the program. While both groups (with and without the component) achieved similar health outcomes, participants reported higher satisfaction and engagement in the "own doctor" condition. The reintervention conducted during the pandemic resulted in additional significant improvements in BMI, blood pressure, eating behaviors, and physical activity levels.
Conclusion: The LBP has demonstrated both short- and long-term efficacy in promoting sustainable lifestyle changes in populations with overweight and obesity, particularly those with hypertension. Similar results are anticipated in ongoing studies involving patients undergoing bariatric surgery and women with infertility associated with obesity and overweight.

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JS2.03

An integrative nutritional approach to address metabolic dysfunction in Steatotic Liver Disease

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Steatotic liver disease (SLD) is the most common chronic liver disease worldwide. While the liver is the primary site of triglyceride accumulation, emerging evidence highlights the central role of adipose tissue (AT) dysfunction in liver disease progression. Beyond its function as an energy reservoir, AT is considered an active endocrine and immunological organ that regulates metabolic homeostasis, and its dysfunction promotes insulin resistance (IR), low-grade chronic inflammation, and hepatic lipotoxicity. AT dysfunction disrupts adipokine homeostasis, leading to leptin resistance and increased leptin levels, and reduced adiponectin levels, a profile associated with reduced insulin sensitivity and inflammation. Additionally, pro-inflammatory cytokines, including TNF-α and IL-6, are elevated in AT dysfunction, further driving metabolic deterioration of the liver. Given the complex AT-liver crosstalk and the importance of the liver in nutrient metabolism and in the regulation of the body's energy homeostasis, dietary interventions play a crucial role in modulating AT and liver metabolism. Optimizing macronutrient composition is crucial for managing SLD and metabolic dysfunction. For example, low-carbohydrate diets have shown to be particularly beneficial as they reduce de novo lipogenesis (DNL) and lipotoxicity, thereby lowering hepatic fat accumulation and improving AT function. Prioritizing fiber-rich carbohydrates, healthy fats and high-quality proteins promotes insulin sensitivity and metabolic flexibility. In contrast, refined sugars, processed meats, and pro-inflammatory fats increase lipotoxicity, inflammation, and metabolic dysfunction. Additionally, meal-timing strategies like intermittent fasting and time-restricted eating have emerged as effective approaches to improve hepatic lipid metabolism, insulin sensitivity, and AT remodeling. Human AT secretes an array of adipokines that are modulated by dietary patterns. These adipokines intricately orchestrate regulatory pathways that impact glucose and lipid metabolism, oxidative stress, and mitochondrial function, thereby influencing the evolution of hepatic steatosis and progression to steatohepatitis. In this sense, reducing refined carbohydrate and fructose intake is an essential intervention, as these nutrients stimulate DNL and AT inflammation. Moreover, prioritizing high quality protein sources such as fish, legumes, and fermented dairy while minimizing processed meats, may reduce metabolic dysfunction by reducing oxidative stress, inflammation, IR and hepatic lipotoxicity. Lastly, increasing fiber intake through vegetables, legumes, and whole grains supports gut health and reduces endotoxemia by modulating the microbiota. The Mediterranean diet is characterized by abundant consumption of monounsaturated fats, polyphenols and a moderate intake of omega-3 fatty acids, therefore it may have a favorable influence on these metabolic and inflammatory mechanisms related to SLD, emphasizing the need to study its effects in the prevention of this pathology and its evolution to steatohepatitis and cirrhosis.

Tuesday, 13 May 2025

JS3 - Joint Session: From Data to Action: Results from the WHO European Childhood Obesity Surveillance Initiative (COSI) Round 6 (2022-2024)

JS3.01

From data to action: results from the WHO European Childhood Obesity Surveillance Initiative (COSI) Round 6 (2022-2024)

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Main Aim: This symposium aims to present and discuss the findings from the WHO European Childhood Obesity Surveillance Initiative (COSI) Round 6 (2022–2024). Conducted across 37 participating countries with standardized methods, this round collected data from approximately 470,000 children aged 6–9. The results highlight the persistent and significant public health threat posed by childhood obesity. The session will emphasize translating "data to action," focusing on Member States' challenges and successes in implementing policies to monitor, prevent, and control overweight and obesity. A special focus will be placed on exploring the links between socioeconomic inequalities, obesity, and related factors. This symposium aims to provide a comprehensive and collaborative platform for exchanging knowledge and catalyzing action to address childhood obesity in the WHO European Region.

JS3.02

Nutrition organization of primary school children in Lithuania

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Introduction: Since 2011, schools in Lithuania have been required to comply with the Order of the Minister of Health "On the Procedure for Organizing Children's Meals". The purpose of the procedure was to ensure healthy nutrition of children, food safety and the best quality, so that children's physiological needs for nutrients were met, and healthy eating skills were developed. At school all children must receive hot food, specified in the menu, cooked on the same day. In this abstract we aim to present the data about nutrition organization at schools, giving the greatest attention to buffet (Swedish table) experience in Kaunas district schools.
Methods: The survey followed the protocol of the WHO European Childhood Obesity Surveillance Initiative (COSI). Cross-sectional study of a national representative sample of first grade children was performed in 96 schools of Lithuania in 2023. Schools and classes were selected randomly from the list of all primary schools in the country. Stratification was applied by district and level of urbanization. Representatives of selected schools filled in the mandatory School Record Form that involved several characteristics of the school environment.

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Results: All the selected schools in ten counties of Lithuania had canteens, also shops or cafeteria where foods or beverages could be purchased strictly following the Order of the Minister of Health. 20.8% of schools had vending machines where children could purchase food or beverages other than water, fruits and vegetables. In 96.9% of schools catering was organized inside school by private companies and in 3.1% - food was delivered in thermoses. 11.5% of schools indicated having a nutrition education course for 7-8-year-old children taught as a separate lesson or integrated into other lessons.
Meals for children are organized by municipalities, so the problem of food waste at schools arises. Kaunas District Municipality - the 6th largest municipality out of 60, has 48 municipal schools and 12 private schools. It has stood out from the others with attention to health-friendly food and organic products, modern production technologies, cozy catering facilities, modern kitchens, food waste control, and focus on the qualification and competence of canteen workers. The Ministries of Health and Education met and have offered Kaunas District Municipality a pilot project and suggested to introduce new tools to change the food culture by using the pupil's self-service ("Swedish table") model.
Conclusions: The conditions created for healthy eating can change the behavior of children. More of them eat at school and don't spend money on fast food in shops near school. Children like the opportunity to choose meals, become more independent, more polite, and learn to use cutlery. The food is healthier, always hot, as it is taken just before eating. Healthy eating skills, eating culture, and the responsibility for uneaten food improved - significantly less food was wasted.

TOPIC SESSION

Sunday, 11 May 2025

TS01 - Gut-Host Interactions in Obesity

TS01.01

Gut Microbiome, Adipose Tissue, and Obesity

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Obesity is a multifactorial disease influenced by genetic, epigenetic, environmental, and possibly microbial factors. The gut microbiome plays a key role in metabolic regulation and systemic inflammation, also influencing adipose tissue functions. The interplay between the gut microbiome and adipose tissue is bidirectional: microbial-derived metabolites such as short-chain fatty acids (SCFAs), bile acids, and others may influence adipocyte differentiation and adipose tissue structure and function as well as other organs and biological systems, Conversely, obesity-induced alterations in adipose tissue, including inflammation and lipolysis, that can possible reshape the gut microbiome. Dysbiosis, marked by reduced microbial diversity and modified microbial composition and function, is commonly observed in obesity and correlates with insulin resistance, metabolic dysfunction, body composition and inflammation. Multi-omics approaches have provided deeper insights into the microbiome-adipose axis, identifying microbial signatures linked to obesity phenotypes and metabolic and cardiovascular health. Interestingly, the emergence of new anti-obesity pharmacotherapies raises the need to assess how the gut microbiome may modulate treatment efficacy, variability in response, and gastrointestinal side effects. Data are available in mice but still remain scarce in humans/ While microbiome-targeted interventions, including probiotics, prebiotics, and postbiotics, hold promise in improving metabolic health, their integration into clinical obesity management remains very limited. Further research is also needed to determine the extent to which microbiome-derived metabolites contribute to adipose tissue remodeling and obesity pathogenesis. A comprehensive approach that combines microbiome, metabolome, and host immune interactions may pave the way for microbiome-informed precision medicine.

TS01.02

Comprehensive multi-omics analysis reveals connections between metabolic obesity, adipose tissue structure, and microbiome composition

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Introduction: Obesity is now recognized as a complex, relapsing metabolic disorder, yet traditional metrics like BMI often fail to capture individual metabolic risk. In this study, we take a multi-omic approach spanning a broad range of BMIs to uncover the metabolic signature of obesity, pinpoint its phenotypic drivers, and reveal potential connections to the gut microbiome.
Methods: We analyzed 1,408 participants from the IGT-Study (794 females and 614 males, aged 50–65, BMI 18.3–46.3 kg/m2, no T2D), and

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466 from the SCAPIS cohort for validation. Each participant underwent dual-source CT scans for body composition, oral glucose tolerance tests, lifestyle assessments (questionnaires, dietary analysis, and physical activity monitoring), and multi-omics profiling (1,190 metabolites, 1,462 proteins, over 15 million bacterial genes, and polygenic risk scores). Using ridge regression on circulating metabolites, we derived a metabolically informed BMI (metBMI). Based on metBMI residuals and WHO BMI classification, participants were categorized as high (HmetBMI) or low (LmetBMI) metabolic BMI.

Results: Our model accounted for 39% of the BMI variation in the IGT cohort and was validated with an out-of-sample R2 of 0.52 in SCAPIS. Participants within HmetBMI exhibited significantly higher insulin resistance, inflammation, and reduced gut microbiome gene richness compared to LmetBMI, irrespective of their actual WHO BMI category. MetBMI residuals were most closely correlated with markers of insulin resistance and hypersecretion and with CT-scan derived visceral adipose tissue area and attenuation. MetBMI and its residuals were more closely associated with gut microbiome gene richness than calculated BMI (Spearman's Rho=-0.3 vs -0.26 vs -0.18, P-value < 0.001). Importantly, the gut microbiome compositions of participants with HmetBMI were more similar to participants with obesity, while LmetBMI microbiome compositions clustered with those of participants with normal weight (HmetBMI vs LmetBMI P-value < 0.001), despite encompassing participants across the BMI range. Importantly, we show that several bacterial taxa are shared across BMI, visceral adipose tissue area, attenuation and metBMI residuals including the sole increase in R. gnavus, linked to impaired glucose tolerance and cardiovascular risk. Taxa specific to metBMI residuals were mainly oral aerotolerant bacteria, that were associated with systemic inflammation. Polygenic risk scores correlated less strongly with metBMI than with conventional BMI, suggesting environmental and microbial factors play a larger role. In line, over 20% of the variance in 66 BMI-predictive metabolites was explained by the microbiome, and 116 significant microbial–metabolite–phenotype linkages were identified in mediation analysis (e.g., Oscillospiraceae associated with beneficial lipid profiles and lower inflammation).

Conclusion: We highlight how multi-omics approaches reveal surrogate markers and disease pathways including the microbiome that bridge the gap between BMI and metabolic obesity, offering clinical insights into precision medicine application.

TS01.03

The role of gut microbiota in the complex interaction between rheumatoid arthritis and insulin resistance

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Introduction: Patients with rheumatoid arthritis (RA) have a higher prevalence of insulin resistance (IR) compared to the general population. Evidence suggests an association between altered gut microbiota and the development of both RA and IR. However, the determinants of a higher prevalence of IR in RA are still unknown.

Objectives: To analyze the relationship of gut microbiota with insulin resistance in patients with RA.

Materials-Methods: Cross-sectional study of 85 patients with RA and 71 sex- and age-matched controls. IR was estimated using the homeostasis model assessment of insulin resistance (HOMA-IR) with values ≥2.29. Insulin sensitivity was estimated using the quantitative insulin sensitivity check index (QUICKI), with a threshold value of 0.337 (μU*mmol/mL*L). Body composition was assessed by dual-energy X-ray absorptiometry. Gut microbiota was analyzed by 16S ribosomal RNA gene sequencing and bioinformatics analysis using Quantitative Insights Into Microbial Ecology 2 (QIIME2). In addition, epidemiological and clinical-analytical variables and the average Disease Activity Score28-erythrocyte sedimentation rate (DAS28-ESR) were analyzed from disease onset to the cross-sectional visit.

Results: Although both RA patients and controls showed similar characteristics regarding carbohydrate metabolism (e.g. insulin resistance and sensitivity, glycemia and insulinemia), of the 85 RA patients, 24 (28.2%) had a HOMA-IR ≥ 2.29. Patients with IR and RA had elevated values for body mass index, weight and body composition and presented a higher BMI, with a higher percentage of fat and an increased waist/hip ratio. Furthermore, RA patients presented elevated levels of proinflammatory cytokines (IL-6, IL-1β, TNF-α) compared to controls. On the other hand, analysis of the gut microbiota revealed small changes in controls with and without IR, whereas among RA patients we observed a greater microbial evenness in those with IR. Furthermore, the genera Dialister, Acidaminococcus and Bacteroides were more abundant in patients with RA and IR compared to those without IR. Factors associated with IR in these patients were body mass index (OR [95% CI], 1.65 [1.15-2.37]; p=0.006), average DAS28-ESR (OR [95% CI], 2.78 [1.12-6.93]; p=0.028), plasma levels of leptin (OR [95% CI], 1.10 [1.02-1.19]; p=0.006) and IL-1β (OR [95% CI], 1.73 [1.07-2.79]; p=0.023), fat mass index (OR [95% CI], 0.80 [0.66-0.97]; p=0.026) and the genus Bacteroides (OR [95% CI], 6.10 [1.09-1.19]; p=0.028). [1.03-36.12]; p=0.046).

Conclusions: RA patients with IR have a different gut microbiota profile than healthy subjects or patients without IR. In addition, the Bacteroides genus was associated with IR.

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TS02 - Challenges for Public Health in comprehensive approaches to address obesity: Where we are and where we need to be

TS02.01

Challenges for Public Health in comprehensive approaches to address obesity: Where we are and where do we need to be?

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Unhealthy weight gain and adiposity are recognised as multifactorial phenomena with causes at the individual, inter-personal, organisational and policy levels. None-the-less, increases in the prevalence of people with unhealthy levels of adiposity in the last 50 years or so, are likely due to rapid changes at the organisational and policy level – particularly in the availability and marketing of cheap, energy dense and nutrient poor food. To prevent unhealthy weight gain and reverse unhealthy adiposity, we require comprehensive, co-ordinated strategies across the spectrum from treatment to prevention, and within the prevention domain, across the levels from individual to policy. Despite widespread recognition of the value of such a diversity of approaches, at least two things continue to draw our attention away from the development and implementation of comprehensive, integrated strategies.

Firstly, the widening availability of GLP-1 receptor agonists may mark a turning point in the treatment of adiposity, but these drugs are symptomatic relief not true treatment of the multiple causes of the 'problem' they seek to solve. Although they offer significant benefits to the individuals who have access to and would like to take them, GLP-1 receptor agonists do nothing to change the organisational and policy conditions that make less healthy food more available, affordable and aggressively marketed than healthier alternatives. Whilst celebrating these technological

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developments, we must not let them overshadow wider prevention strategies, not least because these wider prevention strategies are what will create the conditions to help maintain pharmacologically achieved weight loss once prescribed courses come to an end.
Secondly, our relentless focus on individuals as the source of the 'problem' leads to a sidelining of approaches that might change those organisational and policy conditions. Despite researchers' best efforts to use person-first language, non-stigmatising images and involve people with obesity in research, public discourses around weight continue to focus on issues of individual responsibility, ignorance and moral failure. This makes interventions targeted at helping individuals to change their behaviour, and somehow find healthy ways to navigate unhealthy environments, more politically and publicly acceptable than strategies to change those environments.
Refocusing our attention away from problems of individuals and their bodies, towards ones of broken food systems that make it impossible for many to eat well and maintain a healthy weight may help us to see new ways to develop, advocate for and implement the comprehensive integrated strategies we all agree we need.

TS02.02

The Catastrophic Failures of Public Health in Confronting the Obesity Pandemic

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University Of Navarra; Harvard University

By 2025, global adult obesity prevalence is estimated to have reached 18% in men and surpass 21% in women. Most countries have a less than 10% chance of meeting the 2025 target for halting the rise in obesity. This situation represents a catastrophic failure of public health, highlighting the inadequacy of downstream approaches to address this global crisis. Despite decades of mechanistic research and therapeutic interventions, obesity rates continue to rise at an alarming pace, with dire consequences for individual and societal health. Prevention has definitively failed.
Despite extensive knowledge about the causes of obesity, policymakers lack clear, evidence-based guidance on how to address the problem effectively. This failure is exacerbated by opposition from vested interests in the food and beverage industry, which vigorously resist any measures that might impact their profits and conflicts of interest in some academic sectors.
Moreover, short-sighted policies have failed to tackle the true underlying ("upstream") determinants of the obesity pandemic. The cultural roots related to consumerism, materialism, hedonistic indulgence, undue commercial pressures, and permissiveness have not been adequately addressed. Massive research investments in subcellular biological fields (genomics, proteomics, metagenomics and other -omics) have not delivered substantial results to be translated into effective structural and educational actions. Therefore, funding agencies, health organizations, experts, and governments have largely failed to implement comprehensive strategies to combat obesity.
This failure to meet obesity targets jeopardizes other non-communicable disease reduction goals and has wider social and economic impacts, with ominous reversal of health gains.
A realignment of research investments toward transdisciplinary science is needed. This approach can assess behavioral and educational interventions together with structural integrative models of serious investigations on the socioeconomic, political and culture-based determinants of this pandemic. A further transformation of the culture –and not only basic science or therapeutic fixes– is needed to better identify actionable solutions to combat the unprecedented pandemic of obesity.

TS02.03

Moving Beyond Weight as a Behaviour: Integrating Obesity as a Chronic Disease in Public Health

Ramos Salas, X.
K&X Ramos AB, Sweden

Despite growing recognition of obesity as a chronic disease, public health strategies often remain anchored in outdated paradigms that frame obesity and weight as behaviours. This presentation critiques systemic failures to integrate modern scientific understandings of obesity into public health practice and policy, highlighting persistent overreliance on weight-focused behavioural interventions. Drawing on global case studies, it explores barriers to adopting chronic disease models, including fragmented health systems, weight stigma, and misaligned policies. Public health obesity prevention campaigns can address weight stigma by adopting evidence-based strategies that shift focus from weight to health, prioritize inclusivity, and challenge harmful stereotypes. This presentation will conclude with actionable strategies to integrate obesity as a chronic disease in public health, urging policymakers to prioritize equity, de-stigmatize care, and replace siloed approaches.

TS03 - Preventing Obesity by Supporting Families

TS03

The Role of Digital World in the Etiology of Infant Obesity

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Obesity is a chronic illness with a multifactorial etiology. According to PubMed, the first study exploring the impact of television on children's physical health was published in 1979. Concern about this issue emerged when children began watching television regularly. The advent of portable screens and personalized content has further increased screen time, exacerbating the displacement of healthy lifestyle habits, such as adequate sleep, balanced diets, physical activity, and face-to-face social interactions. Moderate evidence suggests an association between television viewing time and higher energy intake, as well as a less healthy diet, partly due to the promotion of high-calorie food consumption. Children who limit their screen time to less than two hours per day show a lower obesity rate (4.3%) compared to those who exceed this threshold (8.6%). Additionally, screen time spent on activities such as watching television, playing video games, viewing videos, texting, and using social networks has been prospectively and cross-sectionally linked to poorer diet quality in early adolescence. Interventions aimed at reducing screen time have demonstrated significant increases in active leisure, mitigating the displacement effect of screens on healthier forms of leisure. For instance, a combination of reduced screen time and increased physical activity, such as taking more steps daily, has been associated with lower diastolic blood pressure and higher HDL cholesterol levels.
Promoting conscious digital disconnection to counteract the displacement effect of screens on healthy lifestyle habits is a key factor in preventing and reducing obesity rates among children and adolescents.
TS04 - Management of Sleep Apnoea in People With Obesity

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TS04

Management of Sleep Apnoea in People With Obesity

Fietze, I.

Charité-Univeristätsmedzin Berlin

Obstructive Sleep Apnea (OSA) is a widespread condition affecting approximately one billion adults worldwide [Benjafield et al. 2019]. Obesity is a major risk factor, and the anatomical structure of the upper airway significantly influences the severity of OSA.

Treatment is indicated when OSA is severe, causes daytime sleepiness, or is associated with increased comorbidities. In particular, overweight individuals face a heightened cardiovascular risk. Consequently, patients with obesity belong to a high-risk subgroup requiring urgent therapeutic intervention. However, there is a notable shortage of treatment availability, often leading to long waiting times for CPAP therapy or alternative treatments. When positive airway pressure therapy is initiated, patients with obesity typically require higher ventilation pressures and advanced ventilation modes. Weight loss, independent of other benefits, can alleviate nocturnal breathing disorders, reduce ventilation pressure requirements, and, in some cases, eliminate the need for ventilation therapy altogether.

For many years, bariatric surgery was considered an possible treatment for obesity-related OSA but played only a minor role in overall disease management. Recently, novel pharmacological approaches have emerged as effective alternatives with fewer side effects and broader applicability. Tirzepatide, a dual GIP receptor agonist and GLP-1 receptor agonist, has demonstrated significant efficacy in treating obesity in OSA patients, leading to a marked reduction in nocturnal breathing disturbances [Malhotra et al. 2024], comparable to conventional OSA therapies. In the United States, Tirzepatide was recently approved as the first drug therapy specifically for sleep apnea.

GLP-1 receptor agonists are now part of the therapeutic landscape for obstructive sleep apnea and contribute to:

1. Reducing the burden on sleep centers by decreasing the number of patients requiring traditional OSA therapy.
2. Offering an alternative for patients with obesity who may struggle with CPAP or alternatives therapies.
3. Enhancing the effectiveness and adherence to primary OSA treatment strategies.

Benjafield et al. Estimation of the global prevalence and burden of obstructive sleep apnoea: a literature-based analysis. Lancet Respir Med. 2019 Aug;7(8):687-698

Malhotra et al. Tirzepatide for the Treatment of Obstructive Sleep Apnea and Obesity. N Engl J Med. 2024 Oct 3;391(13):1193-1205

Monday, 12 May 2025

TS05 - Central Control of Metabolism

TS05.01

Hypothalamic FGF1 can regulate systemic energy homeostasis

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Introduction: The hypothalamus plays a pivotal role in regulating systemic glucose and energy homeostasis, making it a key target for exploring treatments for diabetes and obesity. Previous studies have highlighted the postprandial increase in fibroblast growth factor 1 (FGF1) levels in cerebrospinal fluid (CSF) and the glucose-normalizing effects of intracerebroventricular recombinant FGF1 administration. However, the role of endogenous hypothalamic FGF1 in metabolic regulation remains largely unknown. This study aims to elucidate the in vivo function of hypothalamic FGF1 through prenatal and postnatal manipulations.

Methods: Endogenous FGF1 expression was analyzed in mouse hypothalamic regions, particularly the ventromedial hypothalamic nucleus (VMH), following refeeding or peripheral glucose administration. To examine FGF1's functional role, we utilized two mouse models: a prenatal VMH-specific FGF1 knock-out (KO) model driven by steroidogenic factor-1 (SF-1) Cre and a postnatal VMH-specific knock-down (KD) model using AAV-mediated delivery. Phenotypic analysis of energy metabolism and leptin sensitivity was conducted in these models.

RESULT: Refeeding or glucose administration significantly increased endogenous FGF1 expression in specific hypothalamic regions, particularly the VMH, via the fgf1b transcript. Both prenatal FGF1 KO and postnatal KD mice exhibited increased fat mass due to decreased VMH leptin sensitivity and reduced energy expenditure. FGF1 depletion led to lower expression of proopiomelanocortin (POMC) and brain-derived neurotrophic factor (BDNF), critical regulators of energy metabolism.

Conclusion: This study provides direct evidence that endogenous hypothalamic FGF1 plays a critical role in metabolic regulation and glucose homeostasis. By combining prenatal and postnatal manipulations, we uncovered the mechanisms through which VMH-derived FGF1 influences energy expenditure and leptin sensitivity. These insights advance our understanding of the hypothalamic pathways involved in systemic energy balance and present potential therapeutic targets for metabolic disorders.

TS05.02

GPR101 modulates body weight and food intake through specific population of neurons

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[4]GIGA-CRC in vivo Imaging, University of Liège; Liège, Belgium

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[7]Graduate School of Pharmaceutical Sciences, Tohoku University; Sendai, Miyagi, Japan

[8]Research Program on Biomedical Informatics, Hospital del Mar Medical Research Institute, Department of Experimental and Health Sciences, Pompeu Fabra University; Barcelona, Spain

Introduction: Obesity is a major cause of morbidity and mortality and there is substantial interest in developing safe, effective anti-obesity medications. More than 30% of prescribed drugs target G-protein coupled receptors (GPCRs), which represent preferred drug targets. We investigated the role of GPR101, a constitutively active orphan GPCR that is highly enriched in the hypothalamus, one particular region of the brain regulating glucose metabolism, body weight, food intake and energy expenditure through distinct neuronal populations that sense nutrient status of the organism and integrate signals from peripheral hormones such as insulin and leptin. Therefore, we aim to uncover the role of GPR101 in health and diseases by hunting down its signaling pathways and its expression in special brain neurons.

Methods: A multidisciplinary approach was used including full and cell-specific knockout mouse lines, transgenic reporter models, metabolic phenotyping, nutritional interventions, single cell profiling of hypothalamic neurons and transcriptome analysis.

Results: We found that the disruption of Gpr101 in mice causes an increase in body weight, adiposity and food intake. Gpr101 is predominantly expressed in specific subsets of neurons localized in the arcuate nucleus of the hypothalamus. Deletion of Gpr101 from these hypothalamic neurons recapitulates the obesity phenotype. We also uncovered the

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constitutive mechanism of GPR101 that potentially represents an important layer of regulation of its signaling and function in obesity. Indeed, we demonstrated that GPR101 is intrinsically activated by its extracellular loop 2 and drives sustained amplification of signaling to regulate mammalian energy homeostasis.

Conclusion: Hence, targeting GPR101 may lead to the development of a novel and effective therapy for obesity and a better side effect profile than GLP-1 receptor agonists. It will also provide potential new molecular targets that could be used to precisely manipulate specific population of neurons for the treatment of obesity and metabolic disorders.

TS06 - Is a New Definition for Childhood Obesity Required?

TS06.01

Definitions of childhood obesity

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Childhood obesity is a multifaceted condition with various contributing factors, where biological elements interact with environmental influences. As a result, children with obesity form a highly heterogeneous group. Despite this complexity, childhood obesity is typically defined using the simple weight-for-height metric, kg/m^2, also known as the Body Mass Index (BMI). Given that BMI generally increases with age and varies between boys and girls, sex-specific BMI charts are employed. These charts often include cutoff points to define overweight, obesity, and severe obesity. Such thresholds are commonly used to guide individual treatment decisions and, on a population level, to monitor the prevalence and trends of overweight, obesity, and severe obesity in children and adolescents. The cutoffs can correspond to specific percentiles or SD lines on the BMI charts (national BMI references and the World Health Organization's international charts, based on US data), or related to adult BMI thresholds for overweight and obesity (the International Obesity Task Force definitions, based on data from six different counties).

Several issues arise with the use of these definitions: 1) None of these definitions predict current or future morbidity, and 2) Different obesity cutoffs yield varying prevalence estimates, making cross-study comparisons challenging.

While using these definitions to monitor trends in obesity prevalence may present fewer issues, identifying a child with obesity in a clinical context should ideally be linked to health risk. Although BMI cutoffs could likely be improved and better associated with present or future health risks, they will continue to both underestimate and overestimate adiposity at the individual level. Therefore, in clinical practice, such cutoffs should always be considered as part of a broader clinical assessment. Efforts are currently underway to move "beyond BMI" in defining obesity in children and adolescents. Any definitions should be carefully constructed to minimize the risk of misclassification and suboptimal clinical management.

TS06.02

Redefining Childhood and Adolescent Obesity or Adiposopathy Across Different Ethnicities

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Obesity is a disease of excess fat accumulation (adiposopathy), however, childhood obesity is mainly diagnosed with body mass index (BMI) which measures both muscle mass and fat resulting in an imprecise and inaccurate assessment. Waist circumference-to-height ratio (WHtR) was recently established as a significantly precise and accurate tool in detecting dual-energy Xray absorptiometry total body fat (total adiposity) and trunk fat (central adiposity). Limitations of BMI in children are its age, sex, and ethnic variations, inability to distinguish between fat and muscle mass, in addition to overestimating or underestimating obesity leading to unnecessary interventions.

Recently, adults' frameworks and clinical consensus statements have strongly recommended that obesity should not be diagnosed with BMI alone but confirmed with WHtR. Among adults, BMI-assessed obesity has wrongly misled the scientific community into believing that "obesity paradox" exists. However, two large-scale randomized controlled trials (RCTs) among multi-ethnic adults reported that WHtR as an adiposity marker refuted "obesity paradox" whilst predicting cardiovascular disease risks. Similarly, since WHtR is highly sensitive and specific for adiposity but not lean mass, the ethnic variations previously emphasized by BMI in adults significantly diminished in the RCTs secondary analyses.

Among children and adolescents from the most recent US National Health and Nutrition Survey (NHANES) conducted between 2021–2023, BMI-estimated overweight and obesity prevalence was 17.2% and 23.8%, respectively. Per ethnic groups overweight and obesity prevalence for Mexican Americans were 23.1% and 27.2%, respectively, other Hispanics 20% and 26.3%, non-Hispanic White 16.7% and 19.7%, and non-Hispanic Blacks 14.7% and 35%, respectively.

We developed new WHtR cutpoints for estimating fat mass in pediatrics, with 0.40-<0.50 as normal, 0.50–<0.53 as high fat (adiposopathy grade 1), and ≥0.53 as excess fat (adiposopathy grade 2). Among ages 12–19 years from the NHANES, WHtR-estimated high and excess fat prevalence was 13.0% and 30.4%, respectively. Per ethnic groups WHtR high and excess fat prevalence in Mexican-American were 16.5% and 38.4%, respectively, other Hispanics were 15.7% and 34.6%, non-Hispanic Whites were 11.3% and 27.5%, and non-Hispanic Blacks were 11.4% and 32.1%, respectively.

In a UK birth cohort, 1431 of 7600 children aged 9 years were classified as BMI-overweight, of whom 25% had WHtR high fat, 11% had WHtR excess fat, and 71% had WHtR normal fat. However, of the 517 British children classified as having WHtR high fat, 69.8% were BMI-overweight and 24% had BMI-obesity, while only 6% had normal BMI. WHtR high fat predicted higher odds of prediabetes [Odds ratio 2.36 (95% CI 1.10–5.10), p=0.028] in NHANES adults, and WHtR excess fat predicted higher odds of type 2 diabetes [6.08 (2.84–13.01), p<0.001].

In conclusion, BMI-obesity underestimated excess fat in Mexican-American, Hispanics, and Whites and overestimated excess fat in Blacks. WHtR can be universally adopted across multi-ethnic groups to prevent, diagnose, and manage excess adiposity in pediatrics.

TS07 - Crosstalk between Muscle and Adipose Tissue in Sarcopenic Obesity

TS07.01

Interleukin-6 as an energy allocator in muscle tissue

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For more than two decades, it has been known that skeletal muscle produces and releases IL-6 dur-ing exercise. Early studies showed that exercise duration, intensity, and glycogen depletion deter-mine IL-6 release, leading to the hypothesis that IL-6 functions as an energy sensor within muscle enhancing glucose availability through both local and endocrine mechanisms. Initially, research re-lied on recombinant human IL-6 infusions to study its effects, but more recent advances have used IL-6 receptor blockade to selectively inhibit IL-6 activity during exercise. This approach has allowed us to investigate IL-6's role in both acute exercise responses and long-term training adaptations. During acute exercise, IL-6's physiological effects are intensity-dependent. During moderate-intensity exercise, where fat is the preferred fuel, IL-6 promotes fatty acid

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mobilization. In contrast, during high-intensity exercise, where glucose becomes the primary energy source, IL-6 stimulates hepatic glucose output. Form a skeletal muscle perspective, IL-6 serves as both an energy sensor and energy allocator, ensuring that the working muscle has sufficient fuel for the required workload. Beyond its direct effects on adipose tissue and the liver, IL-6 also plays a key role in hormonal and immune regulation. During high-intensity exercise, IL-6 stimulates epinephrine secretion, which in turn enhances substrate mobilization and immune cell recruitment. This positions IL-6 as a central coordinator of physiological, immune, and metabolic responses to acute stress. IL-6 is also involved in long-term exercise adaptations. In a study where individuals with abdominal obesity trained for 12 weeks while undergoing IL-6 receptor blockade, participants did not lose visceral adipose tissue, highlighting IL-6's key role in energy allocation and fat distribution. Additionally, people living with obesity often exhibit chronically elevated IL-6 levels, raising the question of whether pro-longed IL-6 exposure leads to IL-6 resistance. While no standard method exists to assess IL-6 re-sistance, our findings suggest that certain IL-6 targets may become less responsive in individuals with obesity. Further research is needed to clarify how chronic IL-6 exposure affects metabolic and immune responses, particularly in the context of obesity and exercise interventions.

TS07.02

Prevalence of low muscle mass and malnutrition in hospital patients with overweight and obesity: a matter of methods

In 't Hulst, J. J. F. A.[1]*; van der Meij, B. S.*[1]*; van Dronkelaar, C.*[2]*; Vasse, E.*[3]*; Lakenman, P. L. M.*[4]*; De Geus, M.*[4]*; Borkent, J. W.*[1]*; de van der Schueren, M. A. E.*[1]

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Introduction: Malnutrition is associated with poor health outcomes in hospitalized patients, including those with overweight and obesity. Internationally, the Global Leadership Initiative in Malnutrition (GLIM) criteria are applied for diagnosing malnutrition [1]. The GLIM guidance group has proposed different methods to assess low muscle mass: easy bed-side measures include Bioelectrical Impedance (BIA) and calf circumference (CC) [2]. However, we question the validity of these approaches in populations with overweight or obesity. Literature indicates that BIA may give inaccurate results to the increased hydration status or invalid algorithms to define low muscle mass [3]. CC may give inaccurate results due to increased subcutaneous fat and potential fatty infiltration of muscle [4]. This study investigates the prevalence of malnutrition according to the GLIM criteria, using both BIA and CC for the assessment of low muscle mass.
Methods: In this multicenter cross-sectional study, adult (≥18 y) hospital patients with overweight or obesity (BMI ≥25 kg/m^2) from various in- and outpatient departments were included. Malnutrition was diagnosed using the GLIM-criteria (table 1). Phenotypic criteria included unintentional weight loss and low muscle mass assessed by both single-frequency BIA and Kyle-equation [5] (Fat-Free mass index (FFMI, kg/m2)), (GLIM-BIA) and corrected CC (GLIM-CC) [5]. Etiologic criteria included reduced food intake or assimilation as assessed by a dietitian and increased inflammation (CRP ≥3 mg/l) [6], both were assessed from medical records. Data is presented as descriptive statistics (mean ± SD and n (%)). Malnutrition was diagnosed when at least 1 phenotypic in combination with 1 etiologic criterion was met. If patients had missed data to interpret the phenotypic or etiologic criterium they were omitted from analysis.
Results: 228 patients were included (61.9 ± 15.0 years, 42.2% female, BMI: 31.2 ± 5.3 kg/m2). Table 1 depicts the results of the individual phenotypic and etiological GLIM-criteria. For GLIM-BIA, 132 patients were eligible for data analysis; the prevalence of malnutrition according to GLIM-BIA was 37 (28.0%). For GLIM-CC 137 patients were eligible for data analysis; the prevalence of malnutrition according to GLIM-CC was 69 (50.4%).
Conclusion: The prevalence of malnutrition according to the GLIM-criteria in hospital patients with overweight or obesity depends on the method used for assessing low muscle mass. The choice of method strongly influences the outcome. This raises questions about the applicability of BIA in patients with a BMI ≥25 kg/m2 and CC as a proxy for muscle mass in these patients. A gold standard to assess low muscle mass and associated cut-off points in patients with overweight or obesity is missing but needs to be determined before conclusions can be drawn on the validity of these measures in patients with overweight or obesity.

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Tab. 1. Frequencies for meeting phenotypic and etiologic GLIM-criteria in 228 hospital patients with overweight or obesity.

Phenotypic criteria	N	
Unintended weight loss in the past year*	228	59 (25.9%)
Low muscle mass		
• BIA†	194	7 (3.6%)
• CC‡	215	64 (29.8%)
Etiological criteria		
Reduced food intake or assimilation¶	60	38 (63.3%)
Increased inflammation§	125	125 (92.0%)

* > 5% within past 6 months or > 10% beyond 6 months. † Male (M):<17 kg/m2, Female (F): <15 kg/m2. ‡ M: <33 cm, F: <32 cm. Measured CC was decreased by 3 cm in patients with a BMI of 25–30 kg/m2 and by 7 cm in patients with a BMI of ≥ 30 kg/m2. ¶ of <50% of energy requirements for >1 week, or any reduction for two week, or any chronic gastro-intestinal condition that adversely impacts food assimilation or absorption. § CRP ≥3 mg/l: for inpatient ≤3 days old, for outpatients ≤10 days old.

TS07.03

Assessment of Nutritional Status in Patients with Sarcopenic Obesity on Hospital Admission

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Introduction: Malnutrition diagnosis in hospitalized patients with obesity can be challenging since traditional screening tools, such as body mass index (BMI), are not always good markers of nutritional status. This can lead to an underestimation of malnutrition, especially in patients with sarcopenic obesity. Advanced methods, such as bioelectrical impedance analysis (BIA) and dynamometry, allow to evaluate parameters such as body cell mass and muscle strength, providing a more complete overview of the nutritional and functional status of these patients.
Objectives: Analyze the prevalence of malnutrition in patients with obesity (BMI ≥30) on hospital admission and to evaluate the usefulness of advanced tools such as bioelectrical impedance analysis (BIA) and dynamometry in clinical practice.

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Methods: A retrospective descriptive study was carried out in 307 patients admitted to Hospital QuirónSalud Málaga (2022-2023). A complete nutritional assessment was performed (MUST, Subjective Global Assessment [SGA] and GLIM criteria), complementary to this assessment bioelectrical impedance was measured with a phase-sensitive touch screen impedance device (Nutrilab™, Akern, Florence, Italy), working with alternating sinusoidal electric current of 245 microampere at an operating frequency of 50 kHz (±1%). Also, handgrip strength was measured with a dynamometer (Jamar®). Data was analyzed based on the presence of malnutrition and sarcopenic obesity (SO).
Results: Of the 307 patients (54.1% male, mean age 63.2 ± 15.4 years, mean BMI 34 ± 3.7 kg/m^2), 36% had malnutrition according to GLIM (26% moderate, 10% severe) and 27.5% met OS criteria.

- Patients with malnutrition had a greater weight loss (4.1 ± 5.9% vs. −0.5 ± 1.1%, $p < 0.01$) and lower PhA (5.2º vs. 5.9º, $p < 0.05$).
- In the SO group, body cell mass (BCM) and muscle strength (HGS) were significantly lower, especially in women (BCM: 24.0 ± 5.8 vs. 32.6 ± 2.5 kg; HGS: 15.8 ± 4.9 vs. 29.5 ± 5.3 kg; $p < 0.01$).
- Positive correlations were identified between BIA measurements and handgrip strength, reinforcing the usefulness of these methods in screening.

Conclusions: Malnutrition and sarcopenic obesity are frequent and underdiagnosed conditions in hospitalized patients with obesity. 36% of the sample presented malnutrition and 27.5% met SO criteria. Techniques such as bioelectrical impedance analysis (BIA) and dynamometry are valuable complementary tools that allow the identification of nutritional and functional alterations not detected by conventional methods, improving the clinical approach to this population.

Tab. 1. Differences in nutritional markers between patients with malnutrition and patients without malnutrition according to GLIM criteria.

ACCORDING TO GLIM CRITERIA	PATIENTS WITHOUT MALNUTRITION	PATIENTS WITH MALNUTRITION
AGE	58.8±15.5	61±18
BMI	33.8±3.9	34.1±5.3
WEIGHT	93.2±14.9	88.1±9.79
% WEIGHT LOSS	-0.5±1.1	4.1±5.9 (p<0.01)
PhA y SPhA	5.9±1.4 +0±1.1	5.2±1.1 -0.3±0.8
BCM (Body Cell Mass)	M 35±8.2 F 28±6.9	M 32.1±6.6 F 24.7±5.6 (p<0.05)
NUTRITION (mg 24h/htm)	999±238	840±203 (p<0.05)
HIDRATATION (TBW/FFM)	75.1±5.2	75.5±4.8
DYNAMOMETRY	M 35.6±8.9 F 21.4±7.9	M 34±8.5 F 17.5±7.6 (p<0.05)

Tab. 2. Differences between patients with Sarcopenic Obesity (SO) and patients without Sarcopenic Obesity.

ACCORDING TO SO CRITERIA (EASO/ESPEN)	PATIENTS WITHOUT SO	PATIENTS WITH SO
AGE	59.6±15.4	61.4±19
BMI	33.6±4.5	34.1±4.3
WEIGHT	93.2±14.9	88.1±9.79
% WEIGHT LOSS	-0.5±1.1	4.1±5.9
PhA y SPhA	5.9±1.3 -0.1±1.1	5±1.2 -0.3±0.9 (p<0.05)
BCM (Body Cell Mass)	M 34.3±7.8 F 32.6±2.5	M 31.8±5.4 F 24±5.8 (p<0.01)
NUTRITION (mg 24h/htm)	1018±212	710±157 (p<0.01)
HIDRATATION (FFM/TBW)	75.6±4.7	74.4±5.8
DYNAMOMETRY	M 35.2±8.7 F 29.5±5.3	H 33.7±7.4 M 15.8±4.9 (p<0.01)

Tuesday, 13 May 2025

TS08 - Weight Regain

TS08.01

Weight Regain after Surgery

Miras, A.

School of Medicine, Ulster University, UK

In this lecture I will be presenting the latest best evidene regarding the use of behavioural pharmacological and surgical treatments for recurrent weight gain after bariatric surgery, in addition to discussing the unanswered research questions in the field.

TS08.02

Deconstructing Weight Cycling: Unveiling Metabolic and Circadian impacts of weight loss and regain in young and mid-aged mice

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Introduction: The health impact of weight cycling (WC) – cycle(s) of weight loss and regain – compared to persistent obesity (PO) remains unclear, with reported adverse, null, or beneficial cardio-metabolic outcomes. This variability reflects inconsistencies in WC definition, study/methodological design, and the observational nature of most clinical studies. Additionally, while obesogenic memory is recognized to persist in the post-obese lean state, whether historical WC manifests in post-weight-loss obesity (PWLO) is less understood. Here we hypothesized that PWLO is imprinted physiologically and in adipose tissue and hypothalamus in a mouse WC model.
Methods: Young and mid-age male mice (7 weeks or 1y old, respectively) were subjected to a 15-week ad-libitum dietary intervention, wherein persistently lean (PL) and PO mice were fed normal-chow or high-fat diets throughout, respectively. PWLO underwent one cycle of weight loss and regain, and late-onset obese (LO) were fed high-fat diet only during the second weight gain phase (weeks 11-15).
Results: Young PWLO mice demonstrated a steeper weight trajectory during the second weight gain phase (week 12) compared to LO or their own weight gain during week 1, suggestive of obesogenic memory. PWLO mice exhibited more impaired glucose tolerance compared to either PO or LO. Interestingly, circadian oscillation of locomotion and energy expenditure were attenuated in PWLO. In mid-aged mice the same dietary challenge resulted in milder dysglycemia, less pronounced circadian oscillation blunting in PWLO, a lower inflammatory response of adipose tissue, and a more pronounced neuroinflammation in the hypothalamus compared to young mice
Conclusion: Our results reveal that weight cycling/PWLO is not a uniform process but rather a multifaceted phenomenon with metabolic and circadian layers of complexity, that are also age dependent. Young mice are more susceptible to glycemic and circadian oscillation disruption and adipose tissue inflammation than mid-age mice, which in turn exhibit greater neuroinflammation.

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TS09 - What Should Pharmacotherapy be Built Around?

TS09.01

Nutrition Therapy During GLP-1 RA Treatment: Moving Beyond Calorie Restriction to Reduce Stigma and Support Patient-Centered Care

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GLP-1 receptor agonists (GLP-1 RAs) have been evaluated in clinical trials for their effectiveness when combined with lifestyle interventions, including physical activity and diet, such as a 500 kcal/day energy deficit. However, these trials do not provide information on how this deficit is monitored or supported throughout the treatment. Despite this, there are widespread recommendations to incorporate such interventions alongside GLP-1 RA treatment, with some countries requiring patients to attend nutritional counseling and follow a '500-calorie deficit diet' to qualify for insurance reimbursement. However, there is no evidence to support the emphasis on a 500-kcal deficit during GLP-1 RA treatment and the optimal nutrition therapy alongside pharmacotherapy remains unclear. In this presentation, I will focus on three key aspects that nutritional therapy should address for patients using GLP-1 RAs. First, ensuring adequate nutrient intake during weight loss is essential for preserving muscle mass, supporting bowel function, and meeting overall nutritional needs for health and well-being. This can be achieved by focusing on diet quality through adequate intakes of protein, essential micronutrients, fiber, and hydrating fluids, while limiting the intake of ultra-processed foods. Second, medication-induced changes, such as reduced appetite and potential side effects, require personalized dietary strategies and medication-related education. Nutritional therapy should focus on supporting patients to listen and respond to new, altered hunger cues, which may require unlearning previous eating behaviors related to portion sizes, meal frequency, and recognizing satiety signals. Third, nutritional therapy should be patient-centered and stigma-free, prioritizing outcomes that matter most to individuals beyond weight loss. This may involve focusing on self-efficacy, self-stigma, body image, health-related quality of life and eating behaviors. The reduced physiological hunger experienced during GLP-1 treatment may present a window of opportunity for patients with emotional eating to better recognize and address emotional eating triggers. There is evidence that mindfulness can help improve eating behaviors and reduce self-stigma. Thus, we have developed a program that integrates methods from systemic therapy, cognitive behavioral therapy, body-integrative therapy, and Mindfulness-Based Stress Reduction (MBSR), grounded in Grawe's therapeutic principles, which will be presented. Its effectiveness will be tested in the future through a randomized controlled trial (RCT). In conclusion, since GLP-1 RAs naturally reduce appetite and create a calorie deficit for most individuals, emphasizing calorie restriction and body weight in nutritional therapy is not only unnecessary but also misaligned with patients' needs and can further contribute to stigma. Therefore, nutrition therapy should shift away from calorie restriction and instead prioritize broader aspects of dietary and behavioral management, promoting sustainable, individualized, patient-centered care to health.

TS09.02

Metabolic alliance: pharmacotherapy and exercise management of obesity

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Obesity management remains a significant challenge due to the high tendency for weight regain after interventions. Recent advancements in anti-obesity pharmacotherapy, particularly glucagon-like peptide 1 (GLP1) receptor agonists and dual GLP1/glucose-dependent insulinotropic peptide (GIP) receptor co-agonists, have demonstrated remarkable efficacy in reducing body weight by modulating appetite and energy intake. However, discontinuation of these treatments often results in weight regain, highlighting the need for long-term strategies. Emerging evidence suggests that exercise is a key metabolic ally that enhances the effects of pharmacotherapy, improving visceral adiposity reduction, long-term weight loss maintenance, and metabolic health.

Beyond weight loss, GLP1 receptor agonists also provide cardiovascular benefits, including reduced risks of myocardial infarction, stroke, and cardiovascular mortality. Additionally, they modulate inflammatory markers, improve myocardial function, and enhance glucose uptake through microvascular mechanisms. Exercise complements these effects by increasing insulin sensitivity, muscle protein synthesis, and cardiorespiratory fitness. Combining pharmacotherapy with exercise can further optimize glucose homeostasis, skeletal muscle function, and appetite regulation. Notably, exercise also enhances GLP1 sensitivity, contributing to more effective metabolic adaptations.

The synergy between pharmacotherapy and exercise presents a novel paradigm in obesity treatment. This combined approach not only improves metabolic health but also counteracts metabolic adaptation, which often hinders long-term weight loss. Future research should focus on optimizing exercise regimens that maximize the efficacy of anti-obesity medications while mitigating potential adverse effects on bone health. This integrated metabolic strategy underscores the importance of a multidisciplinary approach to obesity management, reinforcing exercise as a cornerstone in long-term therapeutic success.

TS10 - Barriers to Treatment

TS10.01

What is the evidence about children, adolescents and caregiver views on what influences participation in obesity management services?

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Introduction: With much published research studying the acceptability of services for children and adolescents living with obesity, the challenge is how to navigate an overwhelming body of evidence. We describe one approach – the review of reviews – specifically used to understand what actually matters to stakeholders (children themselves, caregivers, and professionals) in relation to participation in weight management services. World Health Organization (WHO) guidelines for the management of child and adolescent obesity, now nearing completion, require global evidence on participation in treatments. Reviews of multiple

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qualitative evidence syntheses harness the perspectives of stakeholders while extending coverage of contexts, populations and interventions within a decision-critical timescale. Authors present two international evidence syntheses that have fed into the WHO guideline process.
Methods: This paper presents two linked reviews of reviews of qualitative stakeholder perspectives. A 'Barriers' review, using mega aggregation, assembles and analyses broad barriers to the use of services. A follow-on 'Service engagement' review then interprets stakeholder values and preferences for engagement with such services, using a mega ethnographic approach. For both reviews the authors selected qualitative reviews from 12 bibliographic databases (from 2010-2020, updated to 2024)). By first aggregating and then configuring (interpreting) identified concepts, the review team was able to provide clear recommendations for policy and yet explore the wider context for service delivery. Quality assessment and qualitative sensitivity analyses were undertaken.
Results: Searches retrieved 485 citations, identifying 50 reviews (Barriers) and 17 reviews (Service Engagement) respectively. Included reviews generally elicited mild or moderate concerns in relation to methodological limitations. The Barriers review maps a global synthesis of barriers influencing the use of weight services across 12 broad domains, the most prominent of which were dietary habit influences (including the role of families) and environment-based influences (e.g., accessibility of food at school). Overall, the Service Engagement review provided complementary models for understanding engagement and continued participation in weight management services. In both models, participation is influenced by organisational and family-based roles and actions (e.g., support, perceptions, communication and levels of knowledge). Initial engagement includes a stage of awareness and acceptance that body weight may be an issue.
Conclusions: Global qualitative evidence suggests policy makers and practitioners should seek whole-system approaches to weight management services (e.g., psychosocial, social, environmental, cultural and economic influences). Findings help in understanding factors that influence two complex interactions, first during initial engagement and then throughout continued participation in services. Child, adolescent and parental perspectives provide a vital insight into how these factors interact and how they may be altered to improve service utilisation.

TS10.02

Multidisciplinary approaches

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Obesity is the most common chronic disease in pediatric population. In 2020, it was diagnosed in about 175 million children and adolescents worldwide, but by 2035 this number is likely to increase to about 383 million. Over the last thirty years, the therapeutic goals and methods of treating obesity have gradually evolved from the exclusive pursuit of weight loss towards comprehensive therapy leading to a reduction in the risk of metabolic complications, improvement of motor functions, achieving mental well-being and improving social functioning. It is currently believed that the basis for the successful treatment of childhood obesity is the permanent lifestyle modification, including changing the eating pattern and daily physical activity. The effectiveness of these methods is greatest if the whole family is involved in the process and the intervention lasts a long time. An important support to lifestyle modification in adolescents may be pharmacotherapy and, in selected cases, surgical treatment. In each case, therapeutic methods should be selected individually, according to the causes of obesity, the severity of complications, the age of the patient and the possibility of implementing recommendations. Diagnostic and treatment processes should be conducted in centers where it is possible to provide the patient with long-term, multi-specialist care. In the era of new forms of communication and universal access to information, the role of the Internet, social media and artificial intelligence tools cannot be ignored. All this is both a challenge and an opportunity. Since the social and psychological context is very important in the treatment of childhood obesity, in the near future it will be necessary to go beyond the patterns, look for new solutions and use the opportunities related to the development of not only medicine but also technology.

TS11 - Sarcopenic Obesity Complicated by Disability

TS11.01

Crosstalk between muscle and adipose tissue in sarcopenic obesity – age perspective

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There are well-described changes in body composition along the lifespan, with a decrease in muscle mass and bone mass, and an increase in adipose tissue. Adipose tissue tends to increase in both visceral and subcutaneous regions, but also stores in skeletal muscle and myocardial tissue. These changes have been described as "osteosarcopenic obesity" - a term that is still under debate – because these three tissues are derived from a common stem cell.
In the right environment (in people who exercise and in the absence of inflammation), endocrine regulation tends to maintain or reduce fat mass and increase bone and skeletal muscle mass. However, dysregulation, promoted by ageing, inflammation and a sedentary lifestyle, changes the environment so that fat mass increases and skeletal muscle and bone to decrease in mass and quality. Not surprisingly, adiposity, sarcopenia and osteoporosis increase with age, although, as with all age-related changes, their presentation is highly heterogeneous. The same is true of the interactions between these conditions, which increase the risk of adverse health and functional outcomes.
Changes in the crosstalk between aged adipocytes and muscle cells are not fully understood, but appear to be one of the mechanisms leading to the progression of sarcopenic obesity. In the adipose tissue of persons living with obesity, adipocyte hyperplasia, hypertrophy and activation promote a pro-inflammatory environment and dysregulation of adipokines. These, together with the ectopic accumulation of lipids in skeletal muscle cells, induce mitochondrial dysfunction and increase insulin resistance, thereby enhancing several inflammatory pathways. This self-reinforcing process, in a chronic long-term inflammatory environment (inflammaging), triggers and supports the development of sarcopenic obesity. A better understanding of this crosstalk is needed to develop therapeutic and preventive strategies for each individual disease and for sarcopenic obesity.

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TS11.02

Association between metabolic health and three indexes of metabolic flexibility in young normal weight adults

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Background: Metabolic flexibility (MetF) is the capacity to adapt macronutrients oxidation to fuel availability. MetF is measured using methods that challenge glucose or lipid oxidation and has been proposed to play a role for metabolic health. **Aim:** To determine the association between metabolic health outcomes and three indexes of MetF in humans.
Methods: Eighty-eight healthy individuals (48 women, 40 men) aged 23-31 years with a body mass index of 21.0-25.1 kg/m2 were included. Three indexes of MetF were calculated. First, in an euglycemic-hyperinsulinemic clamp, which is the difference between insulin-stimulated and fasting respiratory exchange ratio (RER) adjusted for fasting RER and glucose disposal rate. This index (MetF-clamp) challenges the capacity to increase glucose oxidation, with higher values indicating higher MetF. Second, in a 23-hour stay in a whole-body room calorimeter, which is the difference between sleep and awake RER adjusted for awake RER. This index (MetF-chamber) challenges the capacity to increase lipid oxidation in the fed-to-fasting transition, with lower values indicating higher MetF. Third, after an overnight fasting, the fasting RER adjusted for the circulating non-esterified fatty acid concentration. This index (MetF-fast) challenges the capacity to oxidize lipids in the fasting state, with lower values indicating higher MetF. The metabolic health outcomes included circulating (glucose, triglycerides, HDL-c), anthropometric (body mass index, waist circumference, waist-to-hip ratio), and body composition markers (fat mass percentage, trunk-to-appendicular fat index, appendicular lean mass index). The associations between metabolic health outcomes and MetF indexes were tested with general linear models adjusted for sex and age.
Results: MetF-chamber was directly associated with the MetF-fast ($r = 0.53$; $P = 0.001$), consistent with both methods challenging lipid oxidation. None of those MetF indexes were associated with MetF-clamp. MetF-clamp was associated with the trunk-to-appendicular fat index ($\beta = -1.55$, $P = 0.001$) and had a borderline significant association with waist circumference ($\beta = -29.1$, $P = 0.098$). MetF-chamber was not associated with any metabolic health outcome. Finally, MetF-fast had borderline significant associations with the trunk-to-appendicular fat index ($\beta = 1.19$; $P = 0.079$) and appendicular lean mass index ($\beta = -0.36$; $P = 0.063$). **Conclusion:** A higher MetF to glucose (MetF-clamp) is associated with lower abdominal fat content in individuals with normal weight. A similar trend was observed with the MetF to lipid (MetF-fast), even though MetF-clamp and MetF-fast were unrelated. These findings suggest that the capacity to increase either glucose or lipid oxidation is improved in participants with a healthier body fat distribution, i.e. lower abdominal fat. Whether any of these MetF indexes associated prospectively with changes in metabolic health will be tested in future studies.

TS11.03

Association of reallocation of movement behaviours with ectopic fat: a cross-sectional analysis of the UK Biobank cohort

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Introduction: The rising obesity prevalance poses major public health challenges due to its association with the metabolic syndrome, cardiovascular disease, type 2 diabetes and many other health outcomes. Ectopic fat, defined as fat accumulation in non-adipose tissues such as the liver and pancreas, is crucial for metabolic health. This study used UK Biobank data to examine associations between device-measured physical activity and sedentary time with ectopic fat, applying isotemporal substitution analysis.
Methods: Proton density fat fractions (PDFF) were determined in the liver and pancreas, and muscle fat index (MFI) was assessed in the anterior thigh muscles using MRI. Accelerometer-derived physical activity (PA) data were analysed to model the effects of reallocating sedentary time, light intensity PA (LPA), and moderate-to-vigorous intensity PA (MVPA) on fat distribution using isotemporal substitution. Multivariate linear regression models were adjusted for confounders: Model 1 included sex, age and height; Model 2 added socioeconomic factors; Model 3 further included lifestyle factors, as well as cancer and non-cancer illnesses. In Model 4, visceral fat was added as a confounder. In sensitivity analysis, interaction terms (e.g., sex*MVPA) were introduced to Model 4 to explore sex-specific effects.
Results: The final analysis included 6,119 individuals, of whom 48% were female (n = 2, 918) with mean ± SD values of age: 64.0 ± 7.4 years, BMI: 25.3 ± 3.9 kg/m² and height: 171.1 ± 9.3 cm. Models 1, 2, and 3 showed significant associations between movement behaviour substitutions and ectopic fat, with only minor variations in coefficients across models (Supplementary Table 1). Replacing 10 minutes of sedentary time with LPA was associated with lower ectopic fat, with percentage differences in Model 3 of -0.79% for liver PDFF, -0.61% for pancreas PDFF and -0.19% for MFI. Substituting sedentary time with MVPA showed even greater differences (-3.11%, -2.54% and -1.12%, for liver, pancreas and muscle, respectively). Replacing LPA with MVPA also showed significantly lower ectopic fat (-2.34%, -1.94% and -0.93% for liver PDFF, pancreas PDFF and MFI). In Model 4, significance remained only when substituting sedentary time with MVPA for liver PDFF (-0.37%), as well as replacing sedentary time or LPA with MVPA for MFI (-0.45% and -0.42%, respectively). The interaction terms were significant across all models, prompting separate analyses by sex. In females, reallocating sedentary time or LPA to MVPA was related to lower pancreas PDFF (-0.98% and -0.85%) and MFI (-0.92% and -0.85%) after adjusting for visceral fat. No significant findings were observed in males.
Conclusions: Isotemporal analyses showed that reallocating sedentary time or lower-intensity physical activities to higher-intensity ones is associated with lower ectopic fat in the liver, pancreas and skeletal muscle. MVPA emerged as a key factor, showing associations which are

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independent of visceral fat. Stronger associations were observed in females than males for pancreas PDFF and MFI. Longitudinal studies are needed to confirm causality and expand isotemporal modelling applications.

Supplementary Tab. 1. Isotemporal substitution of movement behaviours and ectopic fat in the liver, pancreas and anterior thigh muscle.

	10-min decrease in	10-min increase in	Liver PDFF (%)	Pancreas PDFF (%)	MFI (%)
Model 1	Sedentary	LPA	-0.74 (-0.93, -0.56) *	-0.53 (-0.71, -0.34) *	-0.15 (-0.21, -0.09) *
		MVPA	-3.58 (-4.03, -3.14) *	-2.86 (-3.30, -2.41) *	-1.24 (-1.39, -1.09) *
	LPA	MVPA	-2.86 (-3.34, -2.38) *	-2.34 (-2.82, -1.86) *	-1.09 (-1.25, -0.93) *
		Sedentary	0.75 (0.56, 0.93) *	0.53 (0.35, 0.72) *	0.15 (0.09, 0.21) *
	MVPA	Sedentary	3.72 (3.24, 4.19) *	2.94 (2.47, 3.41) *	1.25 (1.10, 1.40) *
		LPA	2.95 (2.44, 3.46) *	2.40 (1.89, 2.90) *	1.10 (0.94, 1.26) *
Model 2	Sedentary	LPA	-0.83 (-1.02, -0.65) *	-0.61 (-0.80, -0.43) *	-0.19 (-0.25, -0.13) *
		MVPA	-3.47 (-3.91, -3.03) *	-2.78 (-3.22, -2.34) *	-1.20 (-1.34, -1.05) *
	LPA	MVPA	-2.66 (-3.14, -2.18) *	-2.18 (-2.66, -1.70) *	-1.01 (-1.17, -0.85) *
		Sedentary	0.84 (0.65, 1.03) *	0.62 (0.43, 0.80) *	0.19 (0.13, 0.25) *
	MVPA	Sedentary	3.60 (3.12, 4.07) *	2.86 (2.39, 3.33) *	1.21 (1.06, 1.36) *
		LPA	2.73 (2.22, 3.24) *	2.23 (1.73, 2.73) *	1.02 (0.86, 1.18) *
Model 3	Sedentary	LPA	-0.79 (-0.97, -0.61) *	-0.61 (-0.79, -0.43) *	-0.19 (-0.25, -0.13) *
		MVPA	-3.11 (-3.54, -2.67) *	-2.54 (-2.98, -2.09) *	-1.12 (-1.26, -0.97) *
	LPA	MVPA	-2.34 (-2.81, -1.86) *	-1.94 (-2.42, -1.46) *	-0.93 (-1.08, -0.77) *
		Sedentary	0.79 (0.61, 0.98) *	0.61 (0.43, 0.80) *	0.19 (0.13, 0.25) *
	MVPA	Sedentary	3.21 (2.74, 3.67) *	2.60 (2.14, 3.07) *	1.13 (0.98, 1.28) *
		LPA	2.39 (1.90, 2.89) *	1.98 (1.48, 2.48) *	0.94 (0.78, 1.09) *
Model 4	Sedentary	LPA	-0.13 (-0.27, 0.02)	-0.03 (-0.18, 0.13)	-0.03 (-0.08, 0.02)
		MVPA	-0.37 (-0.73, -0.01) *	-0.16 (-0.55, 0.24)	-0.45 (-0.58, -0.31) *
	LPA	MVPA	-0.24 (-0.63, 0.14)	-0.13 (-0.55, 0.29)	-0.42 (-0.56, -0.28) *
		Sedentary	0.13 (-0.02, 0.27)	0.03 (-0.13, 0.18)	0.03 (-0.02, 0.08)
	MVPA	Sedentary	0.37 (0.01, 0.74) *	0.16 (-0.24, 0.56)	0.45 (0.32, 0.58) *
		LPA	0.24 (-0.14, 0.63)	0.13 (-0.29, 0.55)	0.42 (0.28, 0.56) *

Data are displayed as the back-transformed β coefficients (exp(β) -1) and CI; * Significant associations between substitution of movement behaviours and ectopic fat (P < 0.05); Model 1: adjusted for sex, age and height; Model 2: further adjusting Model 1 with socioeconomic factors; Model 3: further adjusting Model 2 with lifestyle factors, cancer and non-cancer illnesses; Model 4: further adjusting Model 3 with visceral fat; PDFF, proton density of fat fraction; MFI, muscle fat infiltration; LPA, light physical activity; MVPA, moderate-vigorous physical activity.

TS11.04

Incorporating Subcutaneous Abdominal Adipose Tissue Fibrosis Assessment into Clinical Practice: A Potential Biomarker and Predictor of Morbidity in Obesity

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Introduction: Obesity is a complex chronic disease characterized by adipose tissue expansion and dysfunction, including fibrosis. However, its assessment traditionally relies on anthropometric measures and indirect indicators, leaving the pathological changes within adipose tissue largely unexplored in clinical practice. This study aims to evaluate the feasibility of incorporating subcutaneous adipose tissue (SAT) biopsies into routine clinical practice while assessing whether the direct evaluation of fibrosis provides insights into demographic and cardiometabolic characteristics that differentiate patients with abdominal adipose tissue fibrosis from those without. This approach supports the hypothesis that adipose tissue is the primary site of dysfunction in obesity.
Methods: Abdominal SAT samples were collected from 46 patients with obesity during their first visit to the EASO Obesity Unit at the Arnau de Vilanova University Hospital in Lleida, Spain, in 2024. Fibrosis in adipose tissue was assessed by the pathology department using the FATscore, a semiquantitative index described by Lassen et al. in 2017, which integrates perilobular and pericellular fibrosis. Clinical parameters were obtained from participants' medical records. A cross-sectional analysis was performed to evaluate the variables associated with the existence of fibrosis in adipose tissue. The associations were quantified using the Chi-square test, the Wilcoxon test or the Spearman correlation coefficient, depending on the nature of the variables analyzed.
Results: Fibrosis was identified in the abdominal SAT of 9 patients (19.6%; 95% CI, 10.6% - 33.2%). The presence of fibrosis in adipose tissue was significantly associated with higher FIB-4 scores (p-value = 0.010), suggesting a greater likelihood of liver fibrosis, as well as lower platelet counts (p-value = 0.021) and LDL-cholesterol levels (p -value = 0.036). Additionally, there was a trend toward an association with a diagnosis of type 2 diabetes mellitus (p-value = 0.068). Patients with diabetes tended to exhibit higher FIB-4 scores (p-value = 0.023). The presence of adipose tissue fibrosis appeared to be independent of other cardiometabolic markers, such as body mass index and a diagnosis of arterial hypertension.
Conclusions: Incorporating the evaluation of SAT fibrosis into routine clinical practice could offer a valuable biomarker for stratifying disease severity and guiding tailored interventions. However, further studies are needed to better understand the clinical implications of fibrosis in SAT tissue in individuals with obesity. Platelet levels may serve as indicators not only of liver fibrosis but also of generalized fibrosis. Our findings suggest that the presence of fibrosis in subcutaneous abdominal adipose tissue could be an independent predictor of morbidity and mortality, beyond traditional indicators. Furthermore, the unexpected potential role of lipid-lowering treatments in promoting fibrosis warrants further investigation.

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TS12 - Adipose Tissue & Aging

TS12.01

Impaired brown fat activity on obesity and aging: identification of active repressors of brown adipose tissue

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Defective activity of brown adipose tissue (BAT) is associated with obesity and aging. While much is known about the biological signals that trigger BAT thermogenesis, relatively little is understood about the repressors that may actively impair BAT function in both physiological and pathological contexts. A combination of transcriptomics, bioinformatics, and experimental data from rodent models has facilitated the identification of molecular factors that repress BAT activity. Some of these factors (e.g., kininogen-2, sLR11 protein) function as rheostats, limiting brown adipose activity to prevent excessive activation, while others (e.g., acyl-CoA-binding protein, ACBP, also known as diazepam binding inhibitor, DBI) are downregulated by sympathetic activity and actively suppress BAT function when noradrenergic activation is low. ACBP acts both as an intracellular regulator and, particularly, as a secreted factor with autocrine effects on brown adipocytes. Experimental downregulation of ACBP in mice protects against obesogenesis and metabolic dysfunction. The impact of ACBP as a repressor of BAT activity extends beyond thermogenesis, also leading to significant alterations in the BAT secretome. These changes in the secretome enable reduced BAT activity to send systemic signals that can affect overall metabolism and cardiovascular health. Active repressors of BAT activity are upregulated in obesity and aging, likely contributing to health disturbances in these conditions. As such, they represent potential targets for interventions aimed at improving health outcomes in these contexts.

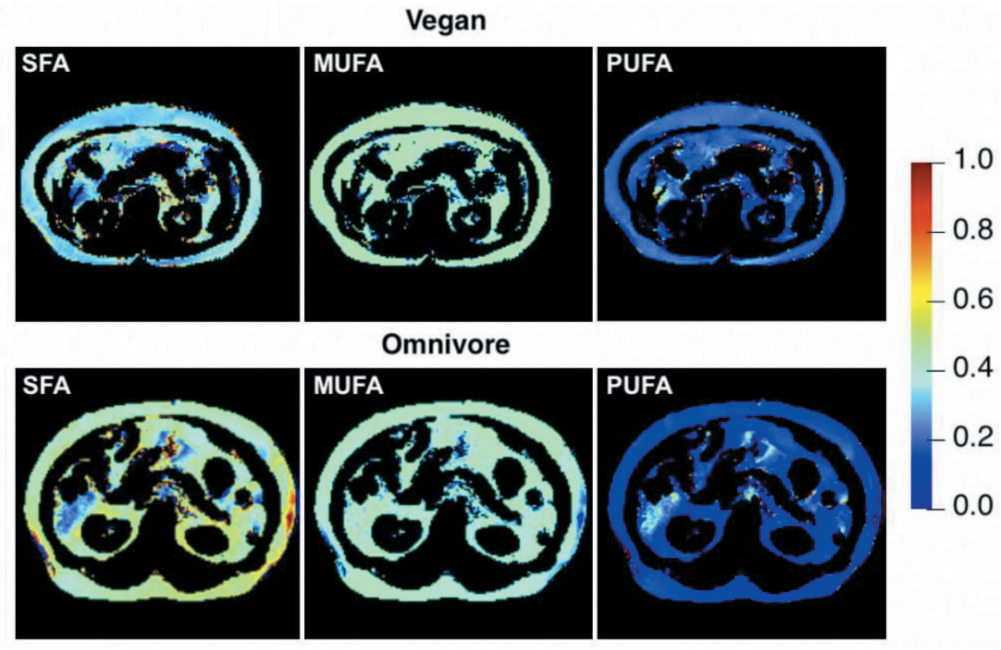
TS12.02

Adipose Tissue Fatty Acid Composition, Diet and Disease

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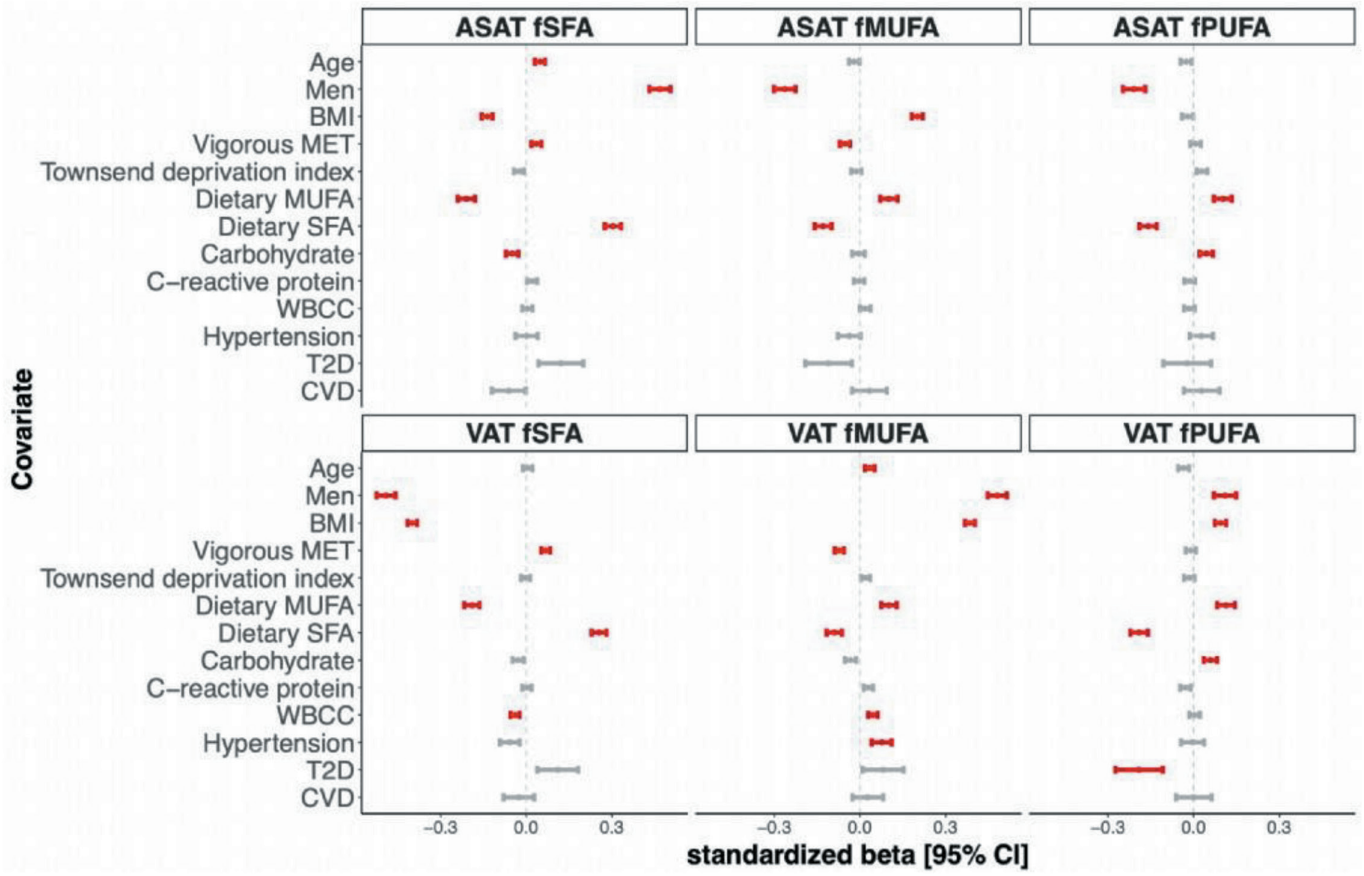
Introduction: Adipose tissue composition, reflecting long-term dietary fatty acid (FA) intake, is linked to metabolic diseases like type 2 diabetes (T2D)[1], hypertension[2], and cardiovascular disease (CVD)[3]. Recent methods have made a more accessible tool for estimating adipose tissue FA composition, using parameters such as the number of double bonds to derive fractions of saturated (fSFA), monounsaturated (fMUFA), and polyunsaturated (fPUFA) fatty acids[4–5]. This study aimed to assess the fatty acid (FA) composition of abdominal subcutaneous (ASAT) and visceral (VAT) adipose tissue in the UK Biobank imaging cohort (N=33,823) using magnetic resonance imaging (MRI).
Methods: Voxel-wise double bond estimation from multiecho MRI from the UK Biobank study was used to derive fSFA, fMUFA, and fPUFA in ASAT and VAT. using methods outlined by Bydder et al.[4], estimating NDB, NMIDB, and FA fractions at a voxel level. A subgroup of participants undertaking vegan and omnivore diet was included to explore dietary effects on FA composition (Figure 1). Covariates such as age, sex, BMI, physical activity, smoking, alcohol intake, and disease status including T2D, CVD and hypertension were adjusted for in regression models.
Results: FA composition was measured for over 33,000 participants. VAT exhibited higher fSFA and fPUFA but lower fMUFA than ASAT in both men and women ($p<0.00016$). Women had higher fMUFA and fPUFA and lower fSFA in ASAT compared to men, while VAT showed the opposite trend. Participants following a vegan diet had lower fSFA and higher fMUFA in both ASAT and VAT compared to those following an omnivore diet ($p<0.00016$). Additionally, regression analysis revealed that dietary intake of MUFA, PUFA, and SFA significantly influenced adipose tissue



Examples of estimated fSFA, fMUFA and fPUFA maps on the ASAT and VAT of a vegan and an omnivore participant. The fSFA and fPUFA are visibly different between the two participants.

Fig. 1.

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Summary of linear regression coefficients of the FA composition in ASAT and VAT representing the associations with the most relevant baseline characteristics on the full cohort. Standardised beta coefficients are displayed with 95% confidence interval.

Fig. 2.

FA composition, with PUFA intake correlating with higher fPUFA in both VAT and SAT (Figure 2).

Conclusion: MRI-based techniques for measuring adipose tissue FA composition are promising tools for studying diet-metabolic health relationships. Our study demonstrates distinct differences in FA composition between adipose tissue compartments and highlights sex and dietary influences. The findings demonstrate clear associations between FA composition, diet, and disease-related traits in a diverse population, providing new insights into the metabolic implications of adipose tissue quality.

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TS12.03

Neonatal overfeeding induces long-term obesity, metabolic disturbances and white adipose tissue dysregulation in a sex-dependent manner

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Introduction: Childhood obesity is a global concern, significantly increasing the risk of metabolic diseases in adulthood. The variation in metabolic risk between sexes is acknowledged, yet the underlying mechanisms remain elusive.
Aims: To explore the metabolic and white adipose tissue (WAT) changes associated with childhood obesity, with a focus on potential sexual dimorphism.
Methods: We used an established mouse model of neonatal-induced obesity by adjusting the litter size at birth to 8 pups per dam for controls (C) and 4 pups per dam for the overfed group ("small litter"; SL). We assessed the phenotype and metabolic state from birth to adulthood, including WAT molecular characterization, and in vivo analysis of lipid turnover from subcutaneous (sWAT) and visceral white adipose tissue (vWAT) through isotope tracing (deuterated water; ^2H_2O).
Results: Litter size reduction led to an increased body weight for SL mice of both sexes that was different from C from post-natal day 7 onwards. Early growth was accompanied by rapid fat mass expansion, where SL mice exhibited increased sWAT and vWAT adiposity at 2-weeks, which persisted into adulthood despite being fed onto a standard chow diet from weaning onwards. Gene expression analysis (qPCR) revealed an upregulation of genes involved in lipogenesis *(Acc1, Fasn, Dgat1, Dgat2, Hsl)* and carbohydrate metabolism (Chrebpa, Glut4) pathways in young SL male mice. Young SL females exhibited a distinct profile *(Acc1, Fasn, Dgat1, Scd1)* with significative but more moderate changes from their respective controls. Adult SL male mice developed glucose intolerance and insulin resistance, whereas females did not. *In vivo* lipid fluxes in WAT of 15-day-old mice uncovered striking sexual dimorphism; lipid uptake was increased in young SL males (1.2 fold change per day SL vs C), whereas females showed an increase in lipid uptake (1.3 fold change per day SL vs C), *de novo* lipogenesis and fatty acid desaturation (1.5 fold change per day SL vs C). By adulthood, WAT molecular changes (namely gene expression) and lipid fluxes were mostly normalized as compared to the controls, yet distinct sex-based profiles in WAT persisted.
Conclusion: Neonatal overfeeding results in long-term changes in body weight, adiposity, and metabolic state, with pronounce sex-specific differences. While males showed a propensity towards glucose intolerance and significant metabolic dysregulation, females did not exhibit these changes. Our findings suggest that early-life nutritional imbalances, sex, and adipose tissue lipid dynamics interact in complex ways. Our study offers valuable insights into sexual metabolic distinctions and provides potential therapeutic targets for obesity and its associated metabolic risks.

Wednesday, 14 May 2025

TS13 - Liver

TS13.01

Intra-cellular cross-talk in MASLD

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Hepatic energy homeostasis is determined by the intricate interplay between different cellular compartments, overall determining the adaptation of liver metabolism to changing environmental conditions. Indeed, the coordinated adaptation of metabolic pathways in the liver to changing environmental cues is critical for systemic and hepatic metabolic health. However, integrative molecular checkpoints in inter-cellular communication and/or coordination still remain largely unknown.
Here, we discuss our recent findings on both intra- and inter-cellular communication pathways in liver and their role in systemic energy homeostasis and metabolic dysfunction, particularly MASLD. Our data overall underline the notion that the coordinated regulation of distinct transcriptional hubs may represent a novel component of integrative inter-cellular communication and metabolic flexibility that may be targeted for therapeutic use.

TS13.02

Angiotensin II type 2 receptor agonists activate brown adipocyte thermogenesis

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Introduction: The angiotensin II type 2 receptor (AT2R) has been proposed as a novel target to promote thermogenesis in lean mice by activating BAT and inducing the browning of white adipose tissue without the cardiovascular side effects of adrenergic stimulation. AT2R is part of the protective branch of the renin-angiotensin system, and its localized activation produces anti-inflammatory and antioxidant effects, although its expression is typically low and only increases in pathological conditions. Nevertheless, the effects of AT2R activation on obese brown adipose tissue as well as the underlying mechanisms remain unclear.
Methods: To analyze the role of AT2R activation in BAT thermogenesis, we administered C21 (1mg/kg/day), a specific AT2R agonist, to HFD-fed obese mice for 6 weeks. In addition, to get insight into the molecular mechanisms, we treated mouse brown preadipocytes (mBA) in vitro with C21.
Results: In vivo, C21 administration in obese mice increased interscapular BAT mass and activity and reduced inflammation. We found elevated levels of the complex III of the respiratory chain, UCP1 and reduced macrophage infiltration. The levels of complexes I and II in another BAT depot, the thoracic perivascular adipose tissue (tPVAT) were also found increased. In vitro, C21 promoted brown adipocyte differentiation through the specific activation of AT2R (as tested with the corresponding AT1R inhibitor, losartan, and AT2R inhibitor, PD123319) through the AKT/eNOS/GSK3β/UCP1 axis.
Conclusion: Taken together, these data suggest that the activation of the AT2R is a promising target to promote the activity of BAT in metabolic disorders.

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TS13.03

FNDC4 decreases mitochondrial damage and PANoptosis through AMPK activation in metabolic dysfunction-associated steatotic liver disease

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Introduction: Fibronectin type III domain containing protein 4 (FNDC4) is an adipokine and hepatokine that modulates metabolism and inflammation in adipose tissue. FNDC4 levels are elevated in various inflammatory diseases, such as ulcerative colitis and irritable bowel syndrome. The molecular mediators responsible for the progression of metabolic dysfunction-associated steatotic liver disease (MASLD) to metabolic dysfunction-associated steatohepatitis (MASH) are not yet fully understood. This study aims to investigate whether FNDC4 is involved in the inflammatory cell death induced by TNF-α in patients with MASLD.
Methods: Plasma FNDC4 levels (n=168) as well as hepatic FNDC4 levels and inflammatory cell death (n=65) were determined in people with severe obesity and MASLD diagnosed by liver biopsy. The effect of FNDC4 on TNF-α-induced pyroptosis, apoptosis, and necroptosis (PANoptosis) and mitochondrial dysfunction *in vitro*, was studied using human HepG2 hepatocytes.
Results: Compared to patients with unaltered liver, those with type 2 diabetes and MASLD showed lower hepatic FNDC4 gene and protein expression (both $P<0.05$), associated with liver inflammation. An overexpression of TNF-α, its receptor TNF-R1, and factors involved in inflammatory cell death was observed in the liver of these patients (all $P<0.05$). *FNDC4* gene silencing in HepG2 hepatocytes increased apoptotic cell death, whereas FNDC4 treatment attenuated PANoptosis in TNF-α-stimulated hepatocytes. FNDC4 also improved mitochondrial dysfunction in TNF-α-stimulated hepatocytes by increasing mitochondrial DNA (mtDNA) content and the expression of subunits of the OXPHOS complexes I, II, III, and V. AMP-activated protein kinase α (AMPKα) was essential for FNDC4-mediated inhibition of cell death and increased mtDNA content.
Conclusion: FNDC4 represents a survival factor for hepatocytes, promoting mitochondrial homeostasis and reducing inflammatory cell death through AMPKα. This study identifies FNDC4 as a promising therapeutic target to prevent hepatocyte damage in MASLD.

TS14 - Policy and Public Health: Commercial Determinants

TS14.01

Nutrition labelling for improving population diets

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Introduction: Nutrition labelling on food packages can support healthful purchases and encourage favourable reformulation. As part of the World Health Organization's (WHO) development of its Guidelines on nutrition labelling policies to promote healthy diets, a review was commissioned with the aim to synthesise evidence on the effects nutrition labelling on diet-related outcomes. This accompanies earlier evidence syntheses and labelling policy guidance from the WHO and WHO Regional Office for Europe specifically for front-of-pack labelling (FOPL).
Methods: We conducted a systematic review and meta-analyses of the evidence on the effectiveness of food labelling to inform policy recommendations. Label types included FOPL, nutrient declarations, nutrient and health claims and ingredients lists. Eleven academic databases were searched from inception to July 2022, complemented by a WHO call for evidence on nutrition labelling policies. Retrieved articles were appraised using the Cochrane Risk-of-Bias 2 tool and a modified Newcastle-Ottawa Scale. GRADE was used to assess the certainty of evidence for labelling comparisons. Meta-analyses and vote counting of direction of effect were performed.
Results: Overall, 221 articles were included on FOPL and 170 articles on other labelling types. Evidence from randomised controlled trials (RCTs) suggested that FOPL likely improved consumer understanding of the nutritional quality or content of foods, and the healthfulness of food choices and purchases (all moderate certainty of evidence). Interpretive FOPL had a greater effect on these outcomes compared to non-interpretive systems (moderate certainty). There was inconsistency in the best performing interpretive FOPL system. Nutrient declarations also likely improved consumer understanding of the nutritional quality or content of foods (moderate certainty). Nutrient and health claims likely increased perceptions of food healthfulness, and increased choice and purchases of labelled foods (all moderate certainty), irrespective of nutritional quality.
Conclusion: The available evidence suggests that FOPL is an important policy tool for promoting healthy diets, improving consumers' understanding of food healthfulness and their food choices and purchases. Most frequently, labelling systems that included a summary indicator performed favourably compared to other systems, and those that incorporated traffic light colour-coding or a nutritional warning were also associated with improved outcomes. There were variations in labelling systems' performance across countries, highlighting the need to consider the country context in the adaptation or design of FOPL systems, including local consumer testing. Nutrient declarations also likely support understanding of the healthfulness of foods and improve food choices. The incorporation of interpretive aides in nutrient declarations may further improve label understanding. Nutrition and health claims, and endorsement logos appear to bestow a 'health halo' on labelled foods. As such, disqualifying conditions, based on the overall nutritional quality of foods, should be established for eligibility to carry a claim or logo.

TS14.02

Fiscal Policies to promote healthier diets

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Fiscal policies, such as tariffs, taxes, levies and subsidies, are important interventions that can help reshape food environments and promote healthier diets for which there is growing evidence of effectiveness. Sweetened soft drink taxes are the most common form of fiscal policy deployed worldwide, with around 100 instances at civic, regional or national level. Sugar sweetened non-alcoholic beverages are uniquely harmful, increasing risk of obesity and type 2 diabetes. There are a number of types of sweetened soft drink tax that either aim to increase product prices for consumers or stimulate manufacturers to reformulate drinks to reduce sugar content. Wider food taxes are less common, but notable examples focus on key unhealthy food categories, such as foods high in fat, salt and sugar.
Subsidies for healthier food retailing or purchases are also widespread, but many examples are targeted at food insecure groups (e.g. the UK's Healthy Start Voucher scheme). Agricultural subsidies incentivize the production of key categories of animal and plant origin unprocessed foodstuffs (e.g. sugar, milk). Trade tariffs operate at a higher level in the food system, regulating the flow of products between nations.
Fiscal instruments operating more upstream in the food system (e.g. trade tariffs and agricultural subsidies) have the potential to be most effective in reshaping the food system away from the dominance of high added value, highly processed foods, towards healthier and more sustainable

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unprocessed and minimally processed foods. Taxes and subsidies are easier to implement but are potentially less effective and easier for the food industry to adapt to while maintaining profits and growth.
In this presentation, I will explore the evidence for the different categories of fiscal policies and discuss their strengths and limitations as instruments to change diets and to reshape the food system. I will explore the relationship between fiscal policy and other areas of food system regulation and propose an agenda for future research and policy to achieve much needed reductions in obesity prevalence and its metabolic consequences.

TS14.03
Marketing regulation of unhealthy food advertising

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Children are highly exposed to ultra-processed, high-energy, nutrient-poor foods and beverages (unhealthy food) advertising, which uses persuasive marketing techniques, influencing their preferences for choices, request to parents, and consumption of unhealthy foods. Children from socio-economically disadvantaged backgrounds are disproportionately exposed to such advertising. Unhealthy food consumption increases the risk of obesity from the earliest stages of life, which gives rise to osteomuscular problems, arterial hypertension, dyslipidaemia, diabetes mellitus, asthma, sleep disorders, low self-esteem, depression, and a higher risk of suffering from obesity and related complications at adult age. Unhealthy food advertising not only impacts the children's right to enjoy the highest possible level of health, but also a number of other rights to which they are entitled, including the rights to food, full potential development, education, information, rest, leisure, recreation and cultural activities, privacy, and non-discrimination. Therefore, states have a positive duty to regulate food advertising to protect children from exposure to the marketing of ultra-processed foods and beverages. Evidence from many countries around the globe shows that voluntary self-regulation or co-regulation measures are not effective in protecting children from unhealthy food advertising. Even statutory measures may not be effective when they are limited to advertising aimed to children. For regulation to be effective, it would require a total ban on unhealthy food advertising to which children are exposed through all media: television, internet, and outdoor and indoor spaces, including advertising in cultural, recreational or sporting events.

TS15 - The Transition to Adult Health Care

TS15
The Transition to Adult Health Care

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Class II-III obesity in adolescence (BMI >35kg/m2) negatively impacts health and wellbeing and is associated to increased risk of several diseases during adulthood and a shorter life expectancy. Lifestyle modifications usually do not achieve sufficient effect to mitigate the risk of medical complications in this group.
In recent years, metabolic and bariatric surgery (MBS), already a well-established treatment for adults with severe obesity, has emerged as an option in adolescents. Controlled studies in this age group have demonstrated substantial and sustained weight loss, improvements in associated health parameters, and a safety profile surpassing that observed in adult patients. Data on long-term outcomes after MBS in adolescents are scarce but existing data indicate similar outcomes as in adults.
Specific considerations for MBS during adolescents include the timing in a young person's life along with patient selection for surgery. Mental health issues are frequently coexisting in adolescents with severe obesity. However, follow up data do not support amelioration of mental health despite large weight loss. Hence, screening of mental health should be an integrated part of follow up after MBS. The follow up should also ensure sufficient supplementation of vitamins and minerals.
MBS is a safe and valuable and under-utilized therapeutic option for adolescents with severe obesity, especially considering the poor health and social wellbeing prognosis in this group. Continued research and multi-professional specialist provision are important. There is a specific need of strategy for the transition into adulthood and to establish long-term follow-up.

TS16 - Syndemic of Obesity and Mental Health

TS16.01
Psychological characteristics influencing weight loss in severe obesity

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Introduction: This study investigated the role of cognitive eating-related psychopathology, irrational food beliefs, and internalized weight stigma as predictors of weight loss in individuals with severe obesity undergoing a brief intensive cognitive behavioral therapy for obesity (CBT-OB) program.
Methods: A total of 400 patients (mean BMI: 41.9 kg/m^2; mean age: 55.9 years) completed a 21-day intensive CBT-OB intervention, followed by a 12-month follow-up assessment. Key measures included the Eating Disorder Examination Questionnaire, the Weight Bias Internalization Scale, and the Irrational Food Beliefs Scale, which were administered at both admission and discharge. Body weight was assessed at the 12-month follow-up.
Results: At the 12-month follow-up, 42.3% of participants achieved clinically significant weight loss (≥5%), and binge-eating episodes showed a marked reduction. Cognitive factors, such as lower baseline eating concerns, higher baseline weight concerns, and greater improvement in irrational beliefs (particularly self-deception related to eating and weight control), were identified as significant predictors of weight loss. In contrast, internalized weight stigma did not emerge as a significant predictor within this cohort.
Discussion: The findings highlight the critical role of specific cognitive factors in predicting long-term weight loss outcomes in individuals with severe obesity. Targeting irrational food beliefs and fostering flexible dietary restraint could enhance the effectiveness of obesity treatments. These results underscore the need for personalized cognitive-behavioral interventions that address maladaptive thought patterns to optimize weight loss and maintenance. Future research should aim to refine these approaches to maximize their clinical utility.

TS16.02
Exploring mental health disorder risks in obesity treatment: insights from the Bariapsy database

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Introduction: Obesity is often associated with mental health disorders, including food addiction, anxiety, and depression. While bariatric surgery and medical obesity management can help alleviate these conditions, some aspects of these disorders may contribute to poor treatment

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response or even worsen after obesity management. The BariaPsy database aims to explore the risks of mental health disorders, identify specific psychological profiles, and analyze the associated sociodemographic and clinical characteristics in patients seeking treatment for obesity.
Method: The BariaPsy database includes a sociodemographic questionnaire and six assessment modules, each consisting of an explanatory video and one or two questionnaires. These modules assess binge eating (Binge Eating Disorder Screening and Binge Eating Scale), anxiety (Generalized Anxiety Disorder-7), depression (Patient Health Questionnaire-9), attention-deficit/hyperactivity disorder (Adult ADHD Self-Report Scale), food addiction (modified Yale Food Addiction Scale Version 2), and impulsivity (Impulsive Behavior Scale Short Form). Data analysis was conducted using a deep learning method known as k-means clustering to determine whether distinct groups of participants with similar profiles can be identified.
Results: Data from 353 participants (Age: M = 45.0 ± 11.3; BMI: M = 43.6 ± 7.6) were analyzed, revealing two distinct profiles: a high-risk group for mental health disorders, representing 42% of participants, and a low-risk group, representing 58%. These groups differed in age (46.1 ± 11.1 vs. 43.7 ± 10.91, U = 16893, p =.024, r = 0.21) but not in BMI (43.61 ± 7.3 vs. 43.67 ± 8.0, U = 8144, p =.939). Additionally, women exhibited a higher frequency of anxiety and impulsivity. No other sociodemographic differences were observed.
Conclusion: These preliminary results highlight the importance of screening for mental health disorders in patients seeking treatment for obesity. They emphasize the need for personalized follow-up and tailored resources for these patients.

Conflict of Interest: Sylvain Iceta Conferences: invitations as a speaker for Novo Nordisk, Takeda Canada, Bausch Health Canada; clinical trials as the main investigator for Takeda Canada. The other authors have no competing interest.

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TS17 - New Perspectives for Managing CVD in Obesity

TS17.01

Effects of Time Restricted Eating on Body Composition in Adults with Obesity

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Time-restricted eating (TRE) has emerged as an alternative dietary intervention for addressing obesity. TRE limits daily energy intake to a predetermined eating window (≤10 h), followed by a fasting period for the remainder of the day (≥14 h). Current literature suggests that TRE leads to modest reductions in body weight along with slight improvements in cardiometabolic health in overweight or obesity. However, some critical aspects of TRE´s effects on body composition remain underexplored, particularly its impact on specific ectopic fat depots such as visceral adipose tissue (VAT). Another key question is whether the timing of the eating window influences its efficacy.
Moreover, the effects of TRE on body composition may differ from those of other weight loss protocols, potentially leading to greater losses in lean mass. However, the impact of TRE on skeletal muscle tissue (SMT) remains largely unknown. This potential adverse effect of TRE may be especially relevant for postmenopausal women with obesity, a population at increased risk of sarcopenic obesity.
Two-RCT of 12-week in duration were conducted, recruiting i) 197 men and women (30-60y) with obesity (ClinicalTrials.gov registration: NCT05310721), ii) 75 postmenopausal women (50-65y) with obesity (ClinicalTrials.gov registration: NCT05912309). VAT and SMT were assessed using magnetic resonance imaging.
AIMS: 1) To investigate the effects of three distinct TRE schedules—earlyTRE, lateTRE and self-selectedTRE—combined with usual care (UC, nutritional education program based on the Mediterranean diet) versus UC alone on VAT and SMT changes in men and women with obesity; 2) To compare the effects of three weight loss interventions (8h-TRE alone, 8h-TRE plus resistance training (TRE+RT) and hypocaloric diet (HD) plus RT) on SMT in postmenopausal women with obesity.
Results: No significant differences were found in VAT changes between earlyTRE (P=0.87), lateTRE (P=0.31) and self-selectedTRE (P ≥0.99) compared with UC, nor among the TRE groups (all P≥0.99). In contrast, mid-thigh SMT loss was greater in earlyTRE (MD: -5.0 cm2; 95%CI, -8.3, -1.7), lateTRE (MD: -3.8 cm2; 95%CI, -6.9, -0.6) and self-selectedTRE (MD: -4.2 cm2; 95%CI, -7.5, -0.9) groups compared with UC regardless of body weight loss, with no differences among the TRE groups (all P>0.7). In postmenopausal women, SMT loss was greater in the TRE compared to the TRE+RT (MD: -6.2±1.1 cm2; P<0.001) and HC+RT (MD: -6.6±1.1 cm2; P<0.001), while no differences were found between TRE+RT and HD+RT groups (MD: -0.4±1.1 cm2; P=1.0).
Conclusions: TRE has no beneficial effect on VAT in individuals with overweight. In contrast, it results in greater skeletal muscle tissue loss compared to a Mediterranean dietary pattern-based treatment in adults with overweight or obesity, as well as to a hypocaloric diet accompanied with resistance training intervention. Interestingly, the harmful effect of TRE on SMT can be mitigated with resistance training, particularly in subpopulations at high risk of sarcopenic obesity, such as postmenopausal women.

TS17.02

Physical Activity

Ermolao, A.

Sport and Exercise Medicine Division, Department of Medicine, University of Padova

Obesity significantly elevates the risk of cardiovascular diseases (CVD), making its management a critical public health priority. This condition elevates the risk of CVD by fostering a pro-inflammatory state, dyslipidemia, and insulin resistance. Combined physical activity and dietary interventions serve as first-line treatments for obesity, aiming for sustained fat loss while preserving muscle mass. Physical activity, can improve body composition by reducing fat mass and enhancing muscle mass, though short-term interventions often yield modest weight loss. In contrast, long-term adoption of exercise training, a planned, structured, and repetitive subset of physical activity, can generate more significant benefits, particularly when combined with dietary modifications. Regular exercise contributes to both weight loss and weight maintenance while improving cardio-metabolic health. Exercise is able to enhance endothelial function, optimize blood lipid profiles, improve insulin sensitivity, reduce blood pressure, and delay the onset of type 2 diabetes. Specifically, moderate-intensity continuous aerobic exercise (50%–70% of maximal heart rate) has been associated with reduced visceral adiposity and a modest weight loss of 2–3 kg through increased energy expenditure. Resistance training, on the other hand, is crucial for preserving lean mass and enhancing muscle strength during weight loss. Recent evidence suggests that vigorous aerobic exercise, including high-intensity interval training (HIIT), in addition to being less time-consuming, may be more effective in reducing visceral adipose tissue and in improving vascular function than moderate aerobic or resistance training. This promising exercise modality, however, should only be prescribed after a thorough cardiovascular risk assessment. Current guidelines, such as those from the European Society of Cardiology, recommend at least 150–300 minutes per week of moderate or 75–150 minutes per week of vigorous physical activity, complemented by

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two to three sessions of strength training, to reduce overall mortality and CVD risk. The European Association for the Study of Obesity advocates for 200–300 minutes per week of moderate-intensity aerobic exercise to maintain weight loss. Recognizing the barriers faced by individuals with obesity, healthcare professionals are encouraged to promote non-sedentary behaviors, such as taking short walking breaks or using stairs, and to employ wearable activity trackers as motivational tools.

In summary, exercise is a cornerstone in managing cardiovascular risk among individuals with obesity. When prescribed correctly and in combination with dietary interventions and self-monitoring strategies, moderate-intensity aerobic training, HIIT and resistance training, ideally used in combination, offer a safe and effective approach to achieving lasting fat loss, an improved cardio-metabolic profile and a better quality of life.

ACCEPTED SYMPOSUM

Sunday, 11 May 2025

AS1 - Obesity across the life course in women: Implications for reproductive health

AS1.01

Childhood body size and reproductive health in women

Pedersen, D. C.

Center for Clinical Research and Prevention, Copenhagen University Hospital – Bispebjerg and Frederiksberg, Copenhagen, Denmark

Introduction: It is well-established that women with overweight and obesity in early adulthood have higher risks of subfertility as well as pregnancy and delivery complications. However, emerging evidence suggests that body size earlier in childhood also impacts women's reproductive health.
Methods: The evidence is primarily based on studies conducted on data from the population-based Copenhagen School Health Records Register. This register includes 200,978 girls born 1930-1996, with information on measured weight and height at ages 7-13 years from which body mass index (BMI) values were calculated. Linkages were performed with Danish national health registers to obtain information on diagnoses of polycystic ovary syndrome (PCOS), endometriosis and infertility as well as gestational hypertension, pre-eclampsia, gestational diabetes, and preterm delivery. Statistical methods included Cox proportional hazard regression models and log-linear binomial regression analyses to estimate hazard ratios and risk ratios, respectively.
Results: We found that childhood BMI was associated with all investigated outcomes, although in a different manner. Whereas childhood BMI was linearly and inversely associated with endometriosis, it had non-linear associations with PCOS with only BMI values above average having positive associations with PCOS. Moreover, we found that girls with overweight and obesity at ages 7 and 13 years had higher risks of infertility in adulthood, when compared to girls with normal weight at these ages. For the associations between childhood BMI and risks of gestational hypertension, pre-eclampsia, gestational diabetes, and preterm delivery, we found similar patterns of BMI values below average not having associations with the outcomes, but for BMI values above average we found that the higher the BMI the higher the risks of these outcomes.
Conclusion: Taken together these results suggests that BMI in childhood relates to women's reproductive health. Thus, our findings highlight the importance of initiating prevention and treatment of overweight and obesity at an early age.

Conflict of Interest: Nothing to declare.

Funding: Independent Research Fund Denmark, grant id: 10.46540/2096-00181B.

AS1.02

Impact of adiposity on breastfeeding intention, initiation, and duration

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Introduction: Nearly one third of women of reproductive age in Europe are living with overweight or obesity. Although there is an awareness of impacts of adiposity on pregnancy and pregnancy-related complications, there is an underappreciation of the challenges women with overweight and obesity may experience with breastfeeding.
Methods: A brief overview of the anatomical, neurological, and hormonal systems that support the process of lactation will be provided. Further, societal and structural factors that impact breastfeeding rates will be discussed. The role of adiposity in breastfeeding initiation and duration will be explored. And finally, current strategies and recommendations on how to support breastfeeding in women living with overweight and obesity will be presented.
Results: Evidence from laboratory and animal studies supports that adiposity alters aspects of the key body systems that support lactation. Epidemiological evidence links higher pre-pregnancy body mass index (BMI) with lower intentions of breastfeeding, reduced odds of initiating breastfeeding and with shortened durations of breastfeeding. Further, there are also psychological, societal, and structural factors that influence breastfeeding intention, initiation, and duration in all women. Unfortunately, evidence from qualitative studies shows that women living with overweight and obesity often experience weight stigma in perinatal interactions with healthcare professionals, and which may further contribute to challenges with breastfeeding initiation and duration. Although limited, evidence supports that tailored lactation support can improve breastfeeding outcomes in women living with overweight and obesity.
Conclusion: Biological, epidemiological, and qualitative evidence support that women living with overweight and obesity may be less likely to intend to breastfeed, and experience greater challenges in initiating and continuing breastfeeding than women with lower BMI values. As breastfeeding is beneficial to infant and maternal health, a greater understanding of how to support breastfeeding among women living with overweight and obesity is urgently needed.

Conflict of Interest: Unrelated to this work, J Baker has received consulting fees from Novo Nordisk A/S.

Funding: Not applicable

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AS1.03

Obesity and menopause - navigating the cardiometabolic transition and finding ways to manage the associated symptoms, including weight gain

Huvinen, E.

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Introduction: All women living past 50 years of age will experience menopause, i.e. their ovarian function will cease, and estrogen levels will drop. The most acknowledged symptoms associated with menopause are hot flushes and sleep problems, but also urinary symptoms, cognitive problems and menstrual irregularities are common. Many women also complain about weight gain. Independent of maintaining their prior lifestyle, weight keeps creeping up and adiposity tissue accumulates in new areas, typically in the mid-section. What is the reason for this weight gain? Are these women lying about their lifestyle or is the decline in estrogen causing weight gain through a biological mechanism?
Methods: This presentation will review the current scientific evidence on obesity and menopause. We cover the associated hormonal and metabolic changes and learn about the best ways to prevent and treat obesity at this stage of life. We will also discuss the exacerbation of menopausal symptoms and special considerations when treating women living with obesity.
Results: According to several longitudinal studies, along the decline in estrogen levels, body composition changes. Lean mass decreases while simultaneously adiposity increases. Among the several metabolic changes, insulin resistance and lipid levels increase leading to an increased risk of type 2 diabetes, metabolic syndrome and cardiovascular disease (1). Whether there is a true considerable decrease in the metabolic rate is still under debate. When considering, however, the several symptoms related to menopause such as poor sleep, stress and musculoskeletal aches, together with the decline in muscle mass, sensitivity to insulin and other satiety signals, the weight gain in menopause becomes highly understandable. But inevitable it is not.(2) Treatment of obesity in menopause focuses on counteracting the background physiological features: the goal is to minimize the changes in body composition and treat menopausal symptoms influencing quality of life. Obesity may exacerbate some menopausal symptoms. Diet should aim at increasing the intake of protein and fiber and physical activity goals emphasize the importance of strength training. Hormone therapy (HT) is efficient in treating the menopausal symptoms and might also help in maintaining healthier body composition (3). HT is, however, not suitable for all women, and therefore we need to have also other options in our toolkit. Obesity medications offer naturally an additional option for managing obesity.
Conclusions: Most importantly, it is essential to acknowledge that women with obesity face double stigma at this stage of life – in addition to obesity, they also face the stigma of menopause. These women require and deserve holistic and multiprofessional care emphasizing individual treatment and non-stigmatizing approach.

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AS1.04

Obesity Across the Life Course in Women

Sveinsdottir, E. G.

Heilsugerdin, Privat Obesity Clinic

Introduction: This seminar focuses on the implications of obesity on women's reproductive health across the life course. Sex hormones play a significant role in influencing body fat distribution and adipocyte differentiation.
Methods and Results: This overview is based on a combination of peer-reviewed scientific literature and insights from clinical practice. The first part of the seminar provides a brief review of the normal hormonal changes that occur throughout a woman's reproductive life and examines how these changes affect adipose tissue. Estrogen levels fluctuate significantly across different life stages, and estrogen receptors vary across organs and cells, including adipocytes.
We will also discuss the disease lipedema as an example, illustrating how estrogen fluctuations during various periods of a woman's life influence adipose tissue, the risk of obesity, and the progression of related pathologies.
Conclusion: The root causes of obesity are multifaceted and vary among individuals. When addressing obesity prevention, diagnosis, and treatment, it is crucial to account for differences in sex hormones and adopt tailored approaches for different stages of a woman's life. This makes obesity treatment in women not only fascinating but also uniquely challenging.

AS1.05

Obesity Management Across the Life Course in Women

Ciudin Mihai, A.

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Introduction: This seminar focuses on the obesity management across the life course in women. Obesity is a chronic relapsing, neurobehavioral disease resulting in excess adipose tissue deposition and dysfunction. Obesity is more prevalent in women than men (18.5% vs 14%, respectively). Furthermore, there are some complications of obesity which are unique to women including effects on ovulation and fertility, pregnancy risk, postpartum weight gain that need specific approach for the management of obesity during the life course.
Methods and Results: This overview is based on a combination of peer-reviewed scientific literature and insights from clinical practice. During the previous seminars of the symposium the physiological changes that occur in a woman body during her life spam from childhood to elderly will be explained. Sex hormones play a significant role in influencing body fat distribution and different strategies for the obesity management. The seminar will be structured according to the physiological periods in the life course of a woman: from childhood, adolescence, reproductive age, including pregnancy and menopause and different strategies for obesity management, according to these periods.
Conclusion: When addressing obesity prevention, diagnosis, and treatment, it is crucial to account for differences in sex hormones and adopt tailored approaches for different stages of a woman's life. This makes obesity treatment in women not only fascinating and uniquely challenging but also very necessary to be addressed properly.

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AS2 - Neurocognitive and Clinical Factors in Obesity and related Eating Disorders Through Lifespan

AS2.01

Shared Clinical and Cognitive Factors in Obesity and Related Eating Disorders

Fernandez-Aranda, F.[1]*; Camacho Barcia, L.*[1]*; Giel, K.*[2]*; Jimenez-Murcia, S.*[1]*; Micali, N.*[3]*; Munguía, L.*[1]*; Zipfel, S.*[2]*; Tena-Sempere, M.*[4]

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[3]Eating Disorders Research Unit, Psychiatric Centre Ballerup, Mental Health Services in the Capital Region of Denmark, Copenhagen, Denmark
[4]Instituto Maimónides de Investigación Biomédica de Córdoba (IMIBIC) and Department of Cell Biology, Physiology and Immunology, University of Córdoba, Spain

Introduction: Eating disorders (EDs) and obesity are complex health conditions that share several risk and maintenance factors, which are exacerbated by co-morbidity. The co-occurrence of both conditions may influence their severity and response to treatment. The increasing prevalence of ED in persons with obesity, and vice versa, requires integrated approaches to study this comorbidity and to identify and analyze both common and distinct features. We aim to examine the common features and complexities of weight and EDs and explore their interrelationships in people who experience both.
Methods: In this presentation we will report on several cross-sectional and longitudinal studies conducted within the ongoing eprObes-EU project. We will report on clinical and cognitive factors in more than 1,000 collected patients with eating disorders and those living with obesity, or both conditions.
Results: Initial results indicate common clinical and cognitive profiles between the groups, particularly at symptom level, personality traits, cognitive profiles (executive functioning domain) and psychopathology. Lifetime obesity in ED, and vice versa, is associated with greater general psychopathology and more dysfunctional personality traits, but also with poorer treatment response among the groups.
Conclusion: These findings shed new light on the importance of early screening and the identification of transdiagnostic features that play a key role in the severity and treatment outcome of patients with ED and people living with obesity.

Conflict of Interest: FFA and SJM received consultancy honoraria from Novo Nordisk. The rest of the authors declare no conflict of interest.

Funding: Research relating to this abstract was partially funded by Generalitat de Catalunya (2021-SGR-00824), CIBERobn (an initiative of ISCIII) and eprObe EU Project (GA101080219, Early Prevention of Obesity).

AS2.02

Genetic and intergenerational risk in Eating Disorders and Obesity

Micali, N.

Canter for Eating and feeding disorder research, Mental Health services of the Capital Region of Denmark

Eating behaviours, body size, and eating disorders behaviours are genetically determined and there is evidence of shared genetic etiology for eating disorder behaviours and body size, as well as eating behaviours and body size. This presentation will include findings from various studies with a range of study designs investigating he role of genetic risk on a range of outcomes. I will share studies on intergenerational risk for eating disorders focusing on national registers including large Scandinavian populations. I will also present studies based on longitudinal population-based studies, investigating the effect of a polygenic risk score for Body Mass Index on childhood eating behaviours, eating disorders and related behaviours. I will highlight in particular the role of BMI in these associations. Lastly I will share future studies, study designs and phenotypes, aimed at disentangling shared genetic effects on eating disorders, eating behaviours and weight.

AS2.03

Shared brain factors in eating disorders and obesity

Favaro, A.; Collantoni, E.; Meneguzzo, P.; Tenconi, E.

Department of Neuroscience, University of Padova, Italy

Research in the fields of neuroimaging, connectomics, and neuropsychology is growing within the context of eating disorders and obesity. Recent advances in neuroscience research, particularly those aspects with direct or indirect clinical implications, will be reviewed in this presentation.
Patients with anorexia nervosa displays distinct neuropsychological characteristics that can potentially impact treatment outcomes and may be addressed through effective therapies. Similarly, although there has been a wealth of new knowledge in the neuroimaging of eating disorders, translating these research findings into clinical practice remains challenging. Some brain and cognitive characteristics are shared across the spectrum of eating and weight disorders, while others reflect the effects of malnutrition and weight fluctuations. The clinical and treatment implications of these characteristics have been underexplored in scientific research, despite some of them showing predictive value for treatment outcomes.
This presentation will particularly focus on two recent studies from our group that explored brain structural characteristics and the approach-avoidance bias across the entire spectrum of eating and weight disorders.

AS2.04

Supporting families to achieve a healthy weight development for their child with overweight/obesity using the STARKIDS intervention: first results of this cluster-randomized controlled trial

Zipfel, S.[1]*; Ziser, K.*[1]*; Erschens, R.*[2]*; Martus, P.*[3]*; Ehehalt, S.*[4]*; Giel, K.*[1]*; Junne, F.*[5]*; Starkids Study Group*[1]

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[3]Institute of Clinical Epidemiology and Applied Biometry, Medical Faculty, University of Tuebingen, Tuebingen, Germany
[4]Public Health Department of Stuttgart, Stuttgart, Germany
[5]Department of Psychosomatic Medicine and Psychotherapy, Otto von Guericke University Magdeburg, Magdeburg, Germany

Introduction: Childhood and adolescent overweight and obesity are among the most serious health challenges today. Structured weight reduction programs can be helpful to reduce severe health consequences but evidence is partly scarce. The STARKIDS program aims to improve on some of these limitations and is designed to be a structured, stepwise, digitally supported intervention program for the whole family. It is divided into two intervention steps spanning over 1.5 years and aims at promoting a healthy weight development of children/adolescents with overweight/obesity and an increase in quality of life.
Methods: The STARKIDS intervention is evaluated in a cluster-randomized study design by comparing it with a control group receiving a one-time structured counselling in the pediatric practice. The study aimed to include more than 600 families with children/adolescents with overweight/obesity from 100 pediatric practices in the State of Baden-Württemberg/Germany. The main outcomes are reduction in body mass index percentiles and improvements in children's/adolescent's quality of life, secondary outcomes refer to the contents of the intervention such as diet, physical activity, stress, and media habits. All outcomes are measured

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on three measurement time points: (T0) at baseline/inclusion in the study, (T1) baseline + 12 months which is the end of step 1 of the STARKIDS intervention, and (T2) baseline + 18 months which is the end of step 2 of the STARKIDS intervention.
Results: The study design and initial results for the main outcome of the intervention are presented.
Conclusion: The stepwise, e-health-supported STARKIDS program is a low-threshold intervention program for families with children/adolescents with overweight/obesity. With the proof of concept, STARKIDS provides the potential to be implemented as a standard care tool for the prevention and intervention of childhood/adolescence obesity in the German health system.

Monday, 12 May 2025

AS3 - Circadian rhythms and obesity: A bidirectional relationship and innovative treatment approaches

AS3.01

Chronodisruption enhances inflammatory cytokine release from visceral adipose tissue in individuals with obesity

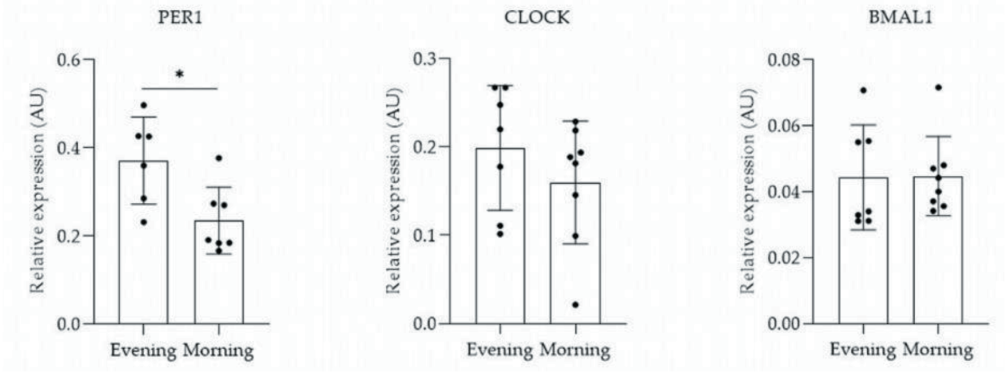
Verde, L.[1]; *Zinna, L.*[2]; *Di Tolla, M. F.*[2]; *Barrea, L.*[3]; *Parascandolo, A.*[2]; *D'Alterio, F.*[4]; *Colao, A.*[5]; *Formisano, P.*[2]; *D'Esposito, V.*[4]; *Muscogiuri, G.*[5]

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[5]Endocrinology, Diabetology and Andrology Unit, Department of Clinical Medicine and Surgery, University of Naples Federico II, Naples, taly

Introduction: Chronodisruption, characterized by circadian rhythm misalignment, has been increasingly linked to inflammatory diseases such as obesity. Chronotype, reflecting individual circadian behavior, is categorized into morning, intermediate, and evening types, with the evening chronotype associated with adverse metabolic profiles and worse body composition. This study assessed the inflammatory profile of visceral adipose tissue (VAT) in individuals with obesity across different chronotype categories and investigated the expression of master clock genes.
Methods: This cross-sectional study included 25 participants with obesity (11 females, 14 males; BMI 41.59±7.69 kg/m^2; age 41.13±11.08 years) awaiting bariatric surgery. Chronotype was classified using the Morningness-Eveningness Questionnaire (MEQ) into morning (MEQ ≥ 59; 36%), intermediate (MEQ 42-58; 28%), and evening (MEQ ≤41; 36%) chronotypes. VAT biopsies were analyzed for cytokines, chemokines, and growth factors using multiplex ELISA, and clock gene expression (PER1, CLOCK, BMAL1) was quantified via qPCR.
Results: Despite similar body composition and biochemical parameters across chronotypes, evening chronotypes exhibited significantly higher triglyceride levels (p=0.012) and lower phase angle (p=0.035) compared to morning and intermediate chronotypes. VAT analysis revealed significantly elevated levels of inflammatory markers such as IL-1β (p=0.04), IL-8 (p=0.03), bFGF (p=0.01), MCP-1 (p=0.01), and MIP-1β (p=0.05) in evening chronotypes, with a decreasing trend from evening to morning types. Evening chronotypes displayed significantly higher bFGF levels than both morning and intermediate chronotypes (p=0.04). Furthermore, PER1 expression was elevated in evening chronotypes (p=0.02) (Figure 1), correlating with VAT-released bFGF (p=0.03) and IL-1β (p=0.03) (Table 1). MEQ scores were inversely correlated with VAT-released bFGF (p=0.02), MCP-1 (p=0.02), and PER1 expression levels (p=0.01) (Table 2).
Conclusion: This study highlighted the role of chronotype in modulating VAT inflammation and clock gene expression in individuals with obesity. Evening chronotypes were characterized by heightened VAT inflammatory dysfunction and altered PER1 expression, suggesting a circadian misalignment that exacerbates their adverse metabolic profile. Importantly, differences in cytokine expression occurred regardless of anthropometric and biochemical parameters, emphasizing that chronotype could serve as an early indicator of individuals at risk of obesity-related inflammation, even before metabolic alterations become apparent. These findings underscore the potential utility of chronotype assessment as a simple and accessible tool for identifying individuals at heightened risk. Moreover, targeting circadian alignment may represent a novel therapeutic strategy to mitigate VAT inflammation and improve metabolic health in this population. Future studies with larger and more diverse cohorts are warranted to confirm these results and explore mechanistic pathways further.

Conflict of Interest: None Disclosed

Funding: No funding to report



PER1, period circadian 1; CLOCK, circadian locomotor output cycles kaput; BMAL1, brain and muscle ARNT-like 1. mRNA levels of PER1, CLOCK, and BMAL1 were determined in VAT biopsies of individuals with evening or morning chronotype by qPCR. Data were normalized on the Ribosomal Protein L13 (RPL13) gene as internal standard. Individual values are expressed in absolute units (AU) and are represented by bar graphs. * denotes a statistically significant p-value (p<0.05).

Fig. 1. VAT mRNA levels of PER1, CLOCK, and BMAL1 in evening or morning chronotypes.

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Tab. 1. Correlation among VAT markers and master clock genes.

VAT markers	PER1		CLOCK		BMAL1	
	ρ (95% CI)	p-value	ρ (95% CI)	p-value	ρ (95% CI)	p-value
IL-1β	0.77 (0.14 – 0.96)	0.03	0.44 (-0.27 – 0.84)	0.21	-0.39 (-0.83 – 0.34)	0.26
IL-8	0.49 (-0.33 – 0.89)	0.22	0.42 (-0.28 – 0.83)	0.22	-0.61 (-0.91 – 0.10)	0.07
bFGF	0.75 (0.09 – 0.95)	0.03	0.69 (0.12 – 0.92)	0.03	-0.36 (-0.81 – 0.37)	0.31
MCP-1	0.70 (-0.22 – 0.87)	0.11	0.79 (0.04 – 0.93)	0.02	-0.35 (-0.79 – 0.42)	0.36
MIP-1β	0.67 (-0.38 – 0.94)	0.16	0.71 (-0.36 – 0.94)	0.14	-0.99 (-0.99 – -0.61)	0.05

VAT, visceral adipose tissue; PER1, period circadian 1; CLOCK, circadian locomotor output cycles kaput; BMAL1, brain and muscle ARNT-like 1; IL-1β, interleukin 1 beta; IL-8, interleukin 8; bFGF, basic fibroblast growth factor; MCP-1, monocyte chemoattractant protein-1; MIP-1β, macrophage inflammatory protein-1 beta. For every correlation, rho (ρ) correlation coefficient is reported, as well as its relative p-value. Emboldened correlations are considered statistically significant (p<0.05).

Tab. 2. Correlation analysis for MEQ scores with VAT markers.

VAT markers	ρ (95% CI)	p-value
IL-1β	-0.475 (-0.784 – 0.023)	0.06
IL-1ra	-0.411 (-0.751 – 0.103)	0.10
IL-2	-0.189 (-0.649 – 0.373)	0.50
IL-4	-0.415 (-0.762 – 0.117)	0.11
IL-5	-0.236 (-0.722 – 0.408)	0.46
IL-6	-0.427 (-0.768 – 0.104)	0.10
IL-7	0.154 (-0.403 – 0.628)	0.60
IL-8	-0.469 (-0.781 – 0.031)	0.06
IL-9	-0.445 (-0.769 – 0.061)	0.08
IL-10	-0.307 (-0.742 – 0.310)	0.31
IL-12	0.001 (-0.564 – 0.564)	0.99
IL-13	0.286 (-0.466 – 0.799)	0.46
IL-17	-0.444 (-0.768 – 0.062)	0.08
Eotaxin	-0.338 (-0.722 – 0.205)	0.20
bFGF	-0.580 (-0.840 – -0.103)	0.02
gCSF	-0.331 (-0.718 – 0.213)	0.21
gmCSF	-0.187 (-0.635 – 0.354)	0.48
IFN-γ	-0.210 (-0.648 – 0.333)	0.43
IP-10	-0.320 (-0.702 – 0.204)	0.21
MCP-1	-0.570 (-0.836 – -0.088)	0.02
MIP-1α	-0.015 (-0.536 – 0.513)	0.96
MIP-1β	-0.345 (-0.775 – 0.303)	0.27
PDGF	-0.335 (-0.756 – 0.282)	0.26
RANTES	-0.334 (-0.719 – 0.210)	0.21
TNF-α	-0.469 (-0.789 – 0.051)	0.07
PER1	-0.640 (-0.881-0.138)	0.01
CLOCK	-0.245 (-0.673-0.305)	0.37
BMAL1	0.160 (-0.398-0.631)	0.56

VAT, visceral adipose tissue; IL, interleukin; EOTAXIN, eotaxin; bFGF, basic fibroblast growth factor; gCSF, granulocyte colony-stimulating factor; gmCSF, granulocyte-macrophage colony-stimulating factor; IFN-γ, interferon gamma; IP-10, interferon gamma-induced protein 10; MCP-1, monocyte chemoattractant protein-1; MIP-1α, macrophage inflammatory protein-1 alpha; MIP-1β, macrophage inflammatory protein-1 beta; PDGF, platelet-derived growth factor; RANTES, regulated on activation, normal T cell expressed and secreted; TNF-α, tumor necrosis factor alpha. For every correlation, rho (ρ) correlation coefficient is reported, as well as its relative p-value. Emboldened correlations are considered statistically significant (p<0.05).

AS3.02

Chrono-Nutritional Patterns, Medical Comorbidities, and Psychological Status in Patients with Severe Obesity before and after weight loss

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Introduction: Chrono-nutrition studies dietary habits and their role in the onset of metabolic diseases. The aim of this study is, firstly, to describe chrono-nutritional patterns based on the analysis of the eating habits of patients with severe obesity during the 24-h cycle and investigate a possible relationship between these profiles, the comorbidities, and the psychological status. Secondly, to determine how chrono-nutritional patterns affect weight loss and comorbidities remission in patients who underwent bariatric surgery.

Materials-Methods: In this observational study, 193 patients with severe obesity were enrolled in the Centre for the Study and the Integrated Treatment of Obesity at the University Hospital of Padua, Italy. From the overall evaluation of the chrono-nutritional profiles of 173 patients with severe obesity, four predominant eating patterns were obtained with a refined statistical model. A regression analysis was performed to determine the relationship between chrono-nutritional patterns, medical comorbidities, and psychological status. The follow-up was possible in 75 patients, 36 ±11 months after bariatric surgery, according to a retrospective longitudinal study: data were collected from the patient's medical records in the hospital's database and from telephone interviews. R software (v4.4.0; R Core Team, 2024) was used in order to handle data, build clusters and check for correlations.

Results: The first most frequent profile (Profile 1, N = 80, 46.2%) was characterised by the regular presence of the three main meals (breakfast, lunch, and dinner). The second profile (Profile 2, N = 11, 6.4%) was formed by patients who regularly had all three main meals and snacks (in the morning, in the afternoon, and in the evening), but not nibbling during the day or any food contacts during the night. Conversely, the third profile (Profile 3, N = 55, 31.8%) was characterised by a constant propensity to eat during all the 24-h, with nibbling and snacking durind day and night. Finally, the fourth profile (Profile 4, N = 27, 15.6%) was similar to the previous one, but with a higher propensity to eat out of the meals during the day and after dinner, but not at night. Chrono-nutritional profiles affected predominantly psychological variables, with lower performances among chrononutritional profiles 3 and 4. After surgery the most frequent clusters were Cluster 2 and 4. Performing a linear regression model, we analyzed the effects of each variable on the outcome (BMI loss): cluster 3 displayed a lower weight loss compared to other clusters (p=0.0487).

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Conclusions: This finding could be useful in the assessment and treatment of patients with obesity, allowing the identification of patients with a higher probability of suffering from a psychopathological condition simply by knowing the patients' dietary profiles. Furthermore, the lower weight loss in Cluster 3, characterized by irregular eating patterns, suggests that chrono-nutrition may play a role in weight regulation.

AS3.03

Chrono-nutrition and body composition of university students with overweight/obesity

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Introduction: Human behavior, shaped by lifestyle, nutrition, metabolism, and genetics, often disrupts the natural circadian cycle due to factors like shift work, irregular meals, and disordered sleep[1]. Such disruptions negatively impact the biological clock, contributing to metabolic issues[2,3]. Obesity, a global epidemic defined by the WHO as excessive adipose tissue accumulation, is linked to chronic and cardio-metabolic diseases[4]. This study protocol aims to explore the relationship between sleep patterns, meal timing, and the nutritional status of university students with overweight/obesity.
Objectives: The primary objective is to determine the relationship between sleep patterns, meal timing, and nutritional status. Secondary outcomes include improving sleep habits and meal schedules based on the findings.
Methods: This quasi-experimental quantitative study will recruit students aged 18–30 years from the Universidad Técnica Particular de Loja during the academic period October 2024–February 2025. Eligible participants must have overweight or obesity, express willingness to participate, and provide informed consent. Exclusion criteria include students currently undertaking a clinical internship and those who are researchers in this study, cognitive impairments, pregnancy, and pacemaker use. A sample size of 410 participants is expected, calculated with a 5% margin of error and 95% confidence level.
Data collection will include sociodemographic characteristics, body composition via InBody 270 bioimpedance analysis, dietary intake using a national food frequency questionnaire, and biochemical parameters measured with the Lipidcare device. Circadian rhythm phenotype will be assessed using the Horne and Osberg questionnaire.
Data will be collected by a trained team, entered into an Excel database, and analyzed using SPSS software (version 26).
Discussion: This study will elucidate how disruptions in circadian rhythms affect metabolic health in university students with overweight/obesity. The findings are anticipated to inform targeted interventions, such as optimizing sleep habits and meal timing, to effectively address obesity-related health challenges.

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Conflict of Interest: None Disclosed

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Wednesday, 14 May 2025

AS4 - The MASH – Obesity intersection

AS4

Weight-independent benefits of semaglutide on histology and non-invasive tests in participants with biopsy-defined MASH: Post hoc analysis of the ESSENCE trial part 1

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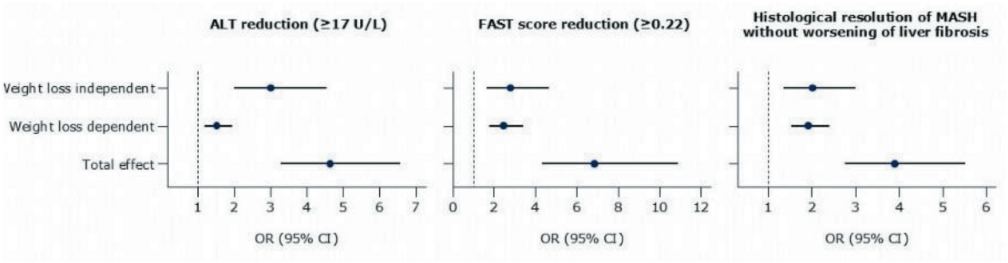
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Introduction: The ongoing phase 3 ESSENCE trial (NCT04822181) reported positive results for histological and non-invasive test (NIT) endpoints in an interim analysis of the first 800 randomised participants with biopsy-defined metabolic dysfunction-associated steatohepatitis (MASH) and F2/F3 fibrosis receiving once-weekly subcutaneous semaglutide 2.4 mg vs placebo. Participants receiving semaglutide achieved a mean weight loss of 10.5% vs 2.0% with placebo. In this post hoc analysis, we assessed the weight dependency of the effects of semaglutide 2.4 mg on study endpoints (NITs and histology) after 72 weeks of treatment, using weight loss-independent and -dependent pathways as covariates.
Methods: NITs and biopsies were assessed at baseline and week 72. MASH-related NIT responder endpoints were change in alanine aminotransferase (ALT; ≥17-unit reduction) and FibroScan-aspartate aminotransferase (FAST) score (≥0.22 reduction). Fibrosis-related NIT responder endpoints were change in vibration-controlled transient elastography (VCTE) liver stiffness measurement (30% reduction) and Enhanced Liver Fibrosis (ELF) score (≥0.5-unit reduction). Histologic endpoints included resolution of MASH and improvement in fibrosis. All endpoints were assessed using logistic regression at week 72 with treatment as exposure, percentage weight loss from baseline to week 72 as mediator, and baseline type 2 diabetes status, fibrosis stage, and body weight as covariates. The total and weight loss-independent and -dependent effect sizes were calculated as odds ratios (ORs), and missing data were omitted. All data are based on the full analysis set from the on-treatment period.
Results: For MASH-related endpoints, the total effect (OR [95% confidence interval (CI)]) for ALT, FAST score and resolution of MASH without worsening of fibrosis was 4.7 (3.3, 6.6), 6.9 (4.3, 10.9) and 3.9 (2.8, 5.5), respectively. ORs (95% CI) for the weight loss-independent effect were 3.0

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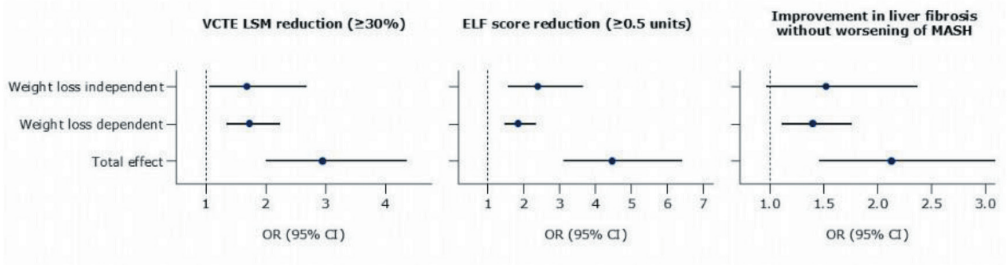
(2.0, 4.6), 2.8 (1.7, 4.7) and 2.0 (1.4, 3.0), respectively, and for the weight loss-dependent effect, the ORs (95% CI) were 1.5 (1.2, 2.0), 2.5 (1.8, 3.4) and 1.9 (1.6, 2.4), respectively (Figure 1). Overall, 71.9%, 53.3% and 51.9% of the total effect for ALT, FAST score and resolution of MASH, respectively, were not mediated by weight loss. For the fibrosis-related endpoints, the total effect (OR [95% CI]) for VCTE, ELF score and improvement in fibrosis without worsening of MASH were 3.0 (2.0, 4.4), 4.5 (3.1, 6.4) and 2.1 (1.5, 3.1), respectively. ORs (95% CI) for the weight loss-independent effect were 1.7 (1.1, 2.7), 2.4 (1.6, 3.7) and 1.5 (1.0, 2.4), respectively, and for the weight loss-dependent effect, the ORs (95% CI) were 1.7 (1.4, 2.2), 1.9 (1.5, 2.3) and 1.4 (1.1, 1.8), respectively (Figure 2). This shows that 48.9%, 58.5% and 55.5% of the total effect for VCTE, ELF score and fibrosis improvement, respectively, were not mediated by weight loss.

Conclusion: Semaglutide 2.4 mg improved MASH-related histological and NIT endpoints and fibrosis-related NIT endpoints through equal contributions of weight loss-independent and -dependent metabolic mechanisms, with effects beyond weight loss.



Data are based on the full analysis set from the on-treatment observation period. All endpoints were assessed for weight loss-independent effects (where the change in the outcome is not attributed to the treatment [semaglutide] effect on the mediator [body weight]) and weight loss-dependent effects (where the change in the outcome is attributed to the treatment effect on the mediator [weight loss]). Effects were considered statistically significant if the lower bound of the CI exceeded 1.0. Responder definitions: ALT reduction ≥17 U/L, FAST score reduction ≥0.22 and histologic resolution of MASH (NAS 0 for ballooning and 0–1 for inflammation). ALT, alanine aminotransferase; CI, confidence interval; FAST, FibroScan-aspartate aminotransferase; MASH, metabolic dysfunction-associated steatohepatitis; NAS, nonalcoholic fatty liver disease activity score; OR, odds ratio.

Fig. 1. MASH-related endpoints.



Data are based on the full analysis set from the on-treatment observation period. All endpoints were assessed for weight loss-independent effects (where the change in the outcome is not attributed to the treatment [semaglutide] effect on the mediator [body weight]) and weight loss-dependent effects (where the change in the outcome is attributed to the treatment effect on the mediator [weight loss]). Effects were considered statistically significant if the lower bound of the CI exceeded 1.0. Responder definitions: VCTE LSM reduction 30%; ELF score reduction ≥0.5 units; ≥1 fibrosis stage improvement. CI, confidence interval; ELF, Enhanced Liver Fibrosis; MASH, metabolic dysfunction-associated steatohepatitis; OR, odds ratio; VCTE LSM, vibration-controlled transient elastography liver stiffness measurement.

Fig. 2. Fibrotic-related endpoints.

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AS5 - Precision medicine for obesity: Integrating nutrition, pharmacotherapy, and big data for personalized care

AS5

Integrating precision nutrition in obesity care

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Obesity remains a major public health challenge worldwide, underscoring the need for more efective personalized strategies. Precision nutrition, which leverages individual-level biological, genetic, and behavioral data to tailor dietary interventions, has emerged as a promising approach. This narrative review summarizes current evidence on precision nutrition for obesity management. First, a randomized controlled trial comparing personalized diets aimed at reducing postprandial glycemic responses vs low-fat diets in individuals with obesity and abnormal glucose metabolism showed no significant difference in overall weight reduction between interventions (difference in weight change: -1.05% [95% CI, −0.40% to 2.50%]; P=0.16), suggesting that personalization based solely on postprandial glucose may be insufficient for robust weight loss. When incoporating genomics, the Personalized Nutrition Study evaluated a genetically informed approach for weight loss, revealing no significant differences in body weight change when diets were matched to "fat-responsive" or "carbohydrate-responsive" genotypes (adjusted difference in weight loss: −0.6 [95% CI: −2.1,0.9], p = 0.50). When combining metabolomic and genetic information, the PREVENTOMICS trial found that delivering metabolomics- and gene-based personalized nutrition plans did not significantly outperform a conventional control diet in a 10-week intervention, indicating that a mixed nutrigenomics and metabolomics model alone may be insufficient to drive greater weight los (personalized: -3.1 [95% CI: -4.1,-2.1] kg; control: -3.3 [95% CI -4.2, -2.4] kg). However, an integrative microbiota- and gene-based model demonstrated a useful tool to prescribe the most suitable diet for weight loss, although further confirmatory trials are needed. Beyond genotypes, the Food4Me trial found that personalized dietary guidance, based on phenotypic or genotypic markers, elicited modest but meaningful improvements in dietary quality, though it did not consistently translate to greater weight loss compared with standard advice (intervention effect body weight: -0.61 (-1.4 to 0.17); P=0.128). Finally, a phenotype-based approach targeting domains such as abnormal satiation, abnormal postprandial satiety, and emotional eating appeared to improve weight-related outcomes (difference in weight loss: −3.1 kg [95%CI, −5.1 to −1.1]; P = 0.004), but requires larger, more diverse trials for confirmation. Collectively, these studies highlight both the promise and complexity of precision nutrition for obesity management. While certain phenotype- and genotype-driven approaches appear beneficial in improving dietary behaviors and some metabolic markers, evidence for substantially superior weight loss remains rather inconclusive. Methodological challenges, short intervention durations, and heterogeneous outcomes underscore the need for more extensive, longer-term, and ethnically diverse trials. Future research should refine robust and reproducible biomarkers, integrate multi-omics data, and further explore behavioral and environmental factors to optimize personalized diets and achieve sustainable weight loss in clinical practice.

ABSTRACT SESSION

Sunday, 11 May 2025

AD01 - The Hidden Sides of Adipose Tissue

AD01.01

Single-cell atlas of human adipose tissue implicates ANGPTL signalling in obesity pathology

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Introduction: Obesity is an escalating metabolic disorder that affects over 1 billion people worldwide, imposing an annual healthcare burden over €2000 per person living with obesity. Adipose tissue (AT) dysfunction is one of the key factors influencing metabolic regulation variability in individuals living with obesity. However, the heterogeneous nature of AT has hampered our understanding of cell-type-specific transcriptional programs during obesity pathogenesis.
Methods: In light of this, we conducted comprehensive single-cell RNA sequencing analyses of subcutaneous and visceral AT from 110 subjects living with non-obese or obese conditions.
Results: Overall, ~300,000 cells were integrated including adipocytes, adipocytes precursor cells (APCs), pre-adipocytes and immune cells. Obesity led to significant shifts in parenchymal cells compositions, including the diminishment of APCs and expansion of pre-adipocytes, mesothelium and lymphatic endothelial cells indicating tissue remodelling. Within the pre-adipocytes category, we identified three transcriptionally distinct pre-adipocytes subtypes originating from APCs, with $APOE^{+}$ pre-adipocytes displaying terminally differentiated functions like lipid metabolism. Notably, in people living with obesity, the diminished ANGPTL-SDC2 interaction initiated from adipocytes to APCs and pre-adipocytes indicates potential metabolic dysregulation. This interplay was validated using bulk transcriptomics and an independent single-cell spatial RNA sequencing dataset.
Conclusion: Taken together, our findings present a human AT atlas. Targeting the ANGPTL signalling represents a promising therapeutic strategy for obesity management. Hence, this study advances our understanding of AT and suggests a foundation for developing targeted interventions in obesity treatment.

AD01.02

ADTRP inhibition improves glucose tolerance, reduces body weight, and enhances FAHFA-driven anti-inflammatory effects in obese diabetic mice

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Introduction: Obesity and diabetes are leading causes of morbidity and mortality worldwide. Dysregulated energy metabolism and inflammation are key pathogenic factors underlying these metabolic diseases. Androgen-dependent tissue factor pathway inhibitor-regulating protein (ADTRP) is a novel enzyme that hydrolyzes anti-inflammatory and anti-diabetic fatty acid esters of hydroxy fatty acids (FAHFA) in adipose tissues. This study aimed to investigate the enzymatic role of ADTRP in regulating energy metabolism and inflammation associated with obesity and diabetes.
Methods: Global ADTRP-knockout (KO) mice were generated using CRISPR/Cas 9 technology. Wild-type (WT) and ADTRP-KO mice were subjected to high-fat diet (HFD) for at least 16 weeks to induce obesity and impaired glucose tolerance. After 16 weeks of HFD, a group of WT mice were administered adeno-associated viral (AAV) vectors expressing ADTRP and the mice were given 4 weeks for ADTRP overexpression.

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To evaluate the effects of ADTRP on FAHFA treatment, 9-palmitic acid hydroxy stearic acid (9-PAHSA), a form of FAHFA, was orally administered to the obese diabetic mice. Body weight of the mice were monitored three times weekly during the course of HFD. At the end of the study, intra-peritoneal glucose tolerance tests were performed, and inguinal and perigonadal adipose tissues were collected after sacrification of the mice. FAHFA levels in adipose tissues were measured using liquid chromatography tandem mass spectrometry (LC-MS/MS), and the percentage of macrophages in perigonadal adipose tissues were determined using flow cytometry.

Results: Overexpression of ADTRP in adipose tissues reduced POHSA (3.14 ± 0.57 pmol/g vs. 5.97 ± 2.62 pmol/g, p = 0.044) and OAHSA (0.199 ± 0.028 vs. 0.385 ± 0.189 pmol/g, p = 0.059) levels, while knockout of ADTRP increased POHSA (20.5 ± 11.4 pmol/g vs. 3.39 ± 0.46 pmol/g, p = 0.046) and OAHSA levels (0.682 ± 0.325 pmol/g vs. 0.191 ± 0.036 pmol/g, p = 0.045) in the adipose tissues. ADTRP-KO mice were significantly lighter than WT mice throughout the course of HFD, and after 16 weeks of HFD, ADTRP-KO mice were 8.63 % lighter than WT mice (38.1 ± 5.5 g vs. 41.7 ± 4.8 g, p = 0.045). Compared to HFD-fed WT mice, HFD-fed ADTRP-KO mice showed decreased blood glucose levels 15 min after intra-peritoneal glucose administration (23.3 ± 3.3 mmol/L vs. 25.9 ± 2.0 mmol/L, p = 0.044). The ADTRP-KO mice also demonstrated lower blood glucose levels throughout the 2 h glucose tolerance test, although the differences were not statistically significant. Both vehicle-treated (14.8 ± 8.7 % vs. 20.8 ± 8.7 %, p = 0.216) and 9-PAHSA-treated (12.4 ± 6.0 % vs. 20.9 ± 7.3 %, p = 0.027) ADTRP-KO mice had a lower percentage of adipose tissue macrophages compared to their WT counterparts, albeit the reduction was only significant in the presence of 9-PAHSA treatment.

Conclusion: Inhibition of ADTRP improves glucose tolerance, reduces body weight, and enhances FAHFA-associated reductions in adipose inflammation in obese diabetic mice, underscoring its potential as a target for obesity and diabetes treatment.

AD01.03

Altered microRNA expression profiles in subcutaneous white adipose tissue and their association with hepatic steatosis in obesity

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Introduction: Hepatic steatosis arises from excessive triglyceride buildup in hepatocytes and correlates with the progression of metabolic dysfunction-associated steatotic liver disease (MASLD). Molecules secreted by subcutaneous white adipose tissue (scWAT), including microRNAs (miRNAs), may contribute to MASLD progression by modulating key metabolic pathways. This study aimed to identify miRNAs in scWAT that correlate with hepatic steatosis in subjects with obesity.

Methods: scWAT samples were collected from 78 individuals with obesity undergoing bariatric surgery from FATe cohort. Patients were categorized into four groups based on their liver fat content. Small RNA sequencing was performed on an Illumina NovaSeq 6000 platform (single-end, 50 bp). Data were processed using the *nf-core/smrnaseq pipeline* (v2.4.0), and differential expression analysis was conducted with *DESeq2* and *isomiRs* R packages. Functional validation of selected miRNAs was carried out *in vitro* using a human hepatocyte cell culture model (HepG2).

Results: A total of 374 miRNAs were differentially expressed across steatosis severity groups. After multiple test corrections, *hsa-miR-372-3p* and *hsa-miR-144-3p* remained significant. Bioinformatic analysis of their predicted target genes revealed pathways related to hepatocellular carcinoma and hepatitis B. *In vitro*, mimic of *hsa-miR-372-3p* and inhibitor of *hsa-miR-144-3p* showed significant changes in expression of key genes involved in lipogenesis and lipolysis, such as *PPARG, ATGL, ACCA, FASN* and *DGAT2*.

Conclusion: The differential expression of *hsa-miR-372-3p* and *hsa-miR-144-3p* in scWAT, along with the *in vitro* validation in hepatocytes, suggests a role for these miRNAs in the regulation of hepatic steatosis and MASLD progression. Their involvement in liver disease-associated pathways highlights their potential role as biomarkers or therapeutic targets for MASLD.

AD01.04

Prdm1 regulates adipocyte transcriptome and the susceptibility to diet-induced obesity in mice

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Introduction: The *PRDM1* gene encodes BLIMP1, a transcription factor that regulates terminal differentiation of B lymphocytes into antibody-secreting plasma cells. The specific loss of *Prdm1* in T regulatory cells increases browning of white adipose tissue (WAT) and protects mice from diet-induced obesity. Unpublished data of our group have shown that *Prdm1* expression increases during adipogenesis and is upregulated in WAT of both mice and humans with obesity. However, the role of BLIMP1 in adipocyte function remains unknown. The aim of the current study is to characterize the effect of the adipose tissue-specific deletion of *Prdm1* on adipocyte transcriptome and metabolism and in the susceptibility to develop obesity.

Methods: Mice with specific loss of *Prdm1* in adipocytes (*Prdm1*ATKO mice) were generated by crossing *Prdm1*flox/flox mice with Adiponectin-Cre mice. Two month-old wild-type (WT) or *Prdm1*ATKO mice were fed with control or high fat diet (HFD) for 12 weeks. Body weight and body composition were evaluated. Whole-body O_2 consumption, CO_2 production, and physical activity were monitored, and Respiratory Exchange Ratio (RER) and Energy Expenditure (EE) were calculated. Adipose tissue depots were obtained, weighed, and histological analysis of fat depots were performed. Adipocytes were isolated from gonadal fat of WT and *Prdm1*ATKO mice fed with HFD. Whole-genome RNA-sequencing (RNAseq) analysis of isolated adipocytes was carried out and bio-informatic analyses of transcriptome data was performed. Palmitate oxidation and O_2 consumption was evaluated in adipocytes.

Results: Mice with specific deletion of *Prdm1* in adipocytes exhibited resistance to diet-induced obesity. Thus, *Prdm1*ATKO female and male mice displayed decreased fat mass percentage due to reduced white and brown adipose depots. Histological analysis showed smaller adipocytes in *Prdm1*ATKO mice fed with HFD as compared with WT-HFD mice.

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RNA-sequencing analysis revealed that the *Prdm1* loss causes differential changes in the transcriptomic profile of adipocytes. Gene ontology (GO) enrichment analysis of differentially expressed genes showed that adipocytes of *Prdm1*ATKO HFD mice displayed downregulation of processes related to cytokine production and activation of immune response. On the contrary, adipocytes lacking *Prdm1* exhibited upregulation of lipid catabolic processes, fatty acid beta oxidation, oxidative phosphorylation, electron transport chain, and adaptive thermogenesis, among others. *In vitro* functional studies showed increased palmitate oxidation and oxygen consumption rate in adipocytes of *Prdm1*ATKO mice, validating transcriptional data. Moreover, *Prdm1*ATKO HFD mice exhibited increased whole-body EE and reduced RER.
Conclusion: Our study establishes a new link between PRDM1 and adipocyte metabolism, impacting systemic metabolic homeostasis and susceptibility to diet-induced obesity.

Conflict of Interest: None Disclosed.

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AD01.05

Overeating Does Not Predict High-Fat Diet-Induced Obesity in Mice

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Background and Aim: Since Hippocrates, people with obesity have been told to lose weight by eating less. This ancient idea that obesity is caused by overeating is ingrained in most of the global population and might be adopted already in early childhood by exposure to media portraying individuals with obesity as gluttonous. Yet, this widespread notion is challenged by an opposing school of thought arguing that overeating is not a driver of obesity, but rather a consequence of metabolic alterations that leads to sequestering of fat in adipose tissue. Using high-fat diet (HFD)-fed C57BL/6 mice, the most commonly employed animal model of obesity, we explored if overeating predicts HFD-induced weight gain.
Methods: Baseline body weight, adiposity, and energy intake were determined in chow-fed mice before shifting to HFD to track changes in energy intake and weight gain. Moreover, HFD-preference was assessed in mice with simultaneous access to chow and HFD. These measures were plotted against the subsequent HFD-induced weight gain.
Results: In line with previous studies, we observed a large variation in HFD-induced weight gain between mice. Despite of their inbred genetic background, some mice were highly susceptible to obesity, while others were remarkably resistant. As expected, we observed that the average energy intake increased acutely when mice were shifted from chow to HFD. Yet, again, we found that there was marked inter-individual variation ranging from no change in energy intake in some mice to more than a doubling in energy intake in others. Strikingly, we found that neither the change in energy intake from chow to HFD nor the initial preference for HFD correlated with subsequent weight gain. Instead, our data revealed that baseline body fat percentage in chow-fed mice correlated closely with body weight gain seen after shifting to HFD.
Conclusion and Perspectives: These findings indicate that overeating is not a primary driver of obesity in HFD-fed mice. Our data aligns with other studies showing that HFD-induced obesity is tightly linked to imprinted and lipid-droplet-associated genes, thus indicating that obesity in HFD-fed mice might primarily be driven by epigenetically-programmed partitioning of fuel into fat depots, rather than hedonic overeating. Collectively, our findings challenge common public prejudices about the causes of obesity and suggest, perhaps provocatively, that currently available appetite-suppressing drugs do not target the fundamental metabolic 'defect' underlying obesity pathogenesis. By figuring out exactly why some inbred mice become fat when fed HFDs, while others do not, we might better understand the biological drivers of excess adiposity and thereby improve prevention and treatment of obesity in humans.

AD01.06

Absence of MCJ/DnaJC15 promotes brown adipose tissue thermogenesis

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Obesity is a global health problem affecting 650 million people worldwide. In this multiorgan framework, our recent work demonstrates that modulation of brown adipose tissue (BAT) activation or white adipose tissue (WAT) browning protects against obesity. BAT is a potential therapeutic target for obesity because of its capacity to burn fat during thermogenesis. Although it is mainly mediated by uncoupling protein 1 (UCP1), recent studies highlight the importance of UCP1independent thermogenesis. In addition, BAT mediates beneficial effects through the secretion of adipokines.
This study describes the role of the mitochondrial protein Methylation-controlled J protein (MCJ/DnaJC15) in orchestrating brown adipose tissue (BAT) thermogenesis. We show how MCJ expression decreases during obesity, as evident in human and mouse adipose tissue samples. We have

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found that BAT mitochondrial activity can be modulated by this protein localized in the mitochondrial inner membrane. The deletion of MCJ in BAT enhances both thermogenic capacity and energy expenditure under high fat diet, protecting against obesity development. Furthermore, mice lacking MCJ presented an increased fatty acid oxidation, correlating with smaller lipid droplets, in the BAT. In fact, transplantation of BAT lacking MCJ into WT mice was sufficient not only to increase BAT activity but to induce browning in the subcutaneous WAT by adipokines secretion. Surprisingly, these animals did not have increased levels of UCP1 and, when crossed with UCP1KO mice, maintain the BAT activation, suggesting an alternative mechanism to exhibit elevated BAT thermogenesis. Electron microscopy unveils changes in mitochondrial morphology resembling BAT activation. Proteomic analysis confirms these findings and suggests involvement of the eIF2α mediated stress response. The pivotal role of eIF2α is scrutinized by in vivo CRISPR deletion of eIF2α in MCJKO mice, abrogating thermogenesis.
Taken together, our data indicate that deletion of MCJ in BAT might be beneficial in obesity through two mechanisms: increasing BAT thermogenesis and inducing WAT browning through an endocrine mechanism. The tools to inhibit this target in vivo have been developed in humans, and we can therefore evaluate its potential use as a therapeutic target.

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AD02 - Psychology and Mental Health

AD02.01

Impact of Psychological Intervention on Managing Overweight and Obesity from an Integrative Approach

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Introduction: Obesity is a multifactorial disease with significant health impacts, characterized by excessive fat accumulation and chronic health consequences. This study emphasizes the importance of psychological intervention for the successful treatment of overweight and obese patients, considering psychological variables such as anxiety, depression, and self-esteem, along with other factors influencing the onset and progression of obesity.
Methods: This is an experimental, multicenter, prospective study with non-randomized convenience sampling. The sample comprises 129 adult participants aged 18 to 60 years, divided into a control group (n=73) and an intervention group (n=56). The intervention group underwent a six-month psychological intervention. Various psychometric questionnaires were employed to measure different variables. Anxiety symptoms were assessed using the State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1986; Spielberger & Lushene, 2015), validated in the Spanish population (Spielberger et al., 1982). Depressive symptoms were measured using the Beck Depression Inventory-II (BDI-II; Beck et al., 1996). Self-esteem was evaluated using the Rosenberg Self-Esteem Scale adapted for adults. Attitudes toward body image were assessed using the Body Shape Questionnaire (BSQ), while attitudes toward eating behaviors were measured using the Emotional Eating Questionnaire (CCE). All these instruments demonstrated high reliability.
Results: The study shows a significant reduction in BMI (Body Mass Index) in both groups, with a higher proportion of individuals achieving normal weight in the psychological intervention group after 12 months and maintaining weight loss over time. The results also indicate an improvement in psychological variables analyzed at the beginning of the intervention in this group. No relevant changes were observed in substance use or significant differences in gender or adherence to nutritional follow-up.
Conclusion: The research confirms that psychological intervention supports weight reduction and maintenance in overweight or obese patients, significantly improving BMI, psychological variables such as anxiety, self-esteem, and body dissatisfaction, and achieving more cases of normal weight. The Mediterranean diet also contributes to BMI reduction, with no significant differences between genders or between overweight and obesity. Further studies are needed to confirm whether psychological intervention reduces the dropout rate in nutritional follow-up and to highlight the psychologist's role in addressing these conditions.

Conflict of Interest: None Disclosed.

Funding: No funding to report.

AD02.02

Internalized Weight Stigma in Obesity: A Study on Cognitive Dissonance with Six-Month Follow-Up

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Introduction: Internalized weight stigma refers to the personal acceptance of negative societal or cultural beliefs about body weight, which can lead to clinical and psychological impairment in patients with obesity. Cognitive-behavioral interventions have not demonstrated significantly greater efficacy in reducing internalized stigma than behavioral weight loss programs. Conversely, cognitive dissonance-based interventions administered to general population samples have significantly reduced weight stigma. This study aims to evaluate the effectiveness of a two-session cognitive dissonance-based intervention in addressing internalized weight stigma.
Methods: A total of 365 consecutive patients seeking intensive cognitive-behavioral treatment for obesity participated in an introductory group outlining the nature of internalized weight stigma and the proposed intervention. Of these, 117 patients agreed to participate in the two-session cognitive dissonance-based intervention (dissonance group), while 248 declined and served as controls. Internalized weight stigma was assessed using the Weight Bias Internalization Scale (WBIS) at baseline (T1), after three weeks (T2), and at a 6-month follow-up (T3).
Results: At baseline, the dissonance group had significantly higher WBIS scores than the control group (4.5 ± 1.3 vs. 4.0 ± 1.3). WBIS scores declined significantly in both groups by T2, with scores reducing to 3.6 ± 1.3 in the dissonance group and 3.1 ± 1.2 in the control group. These reductions remained stable at T3, with scores of 2.7 ± 1.5 and 2.4 ± 1.4, respectively.
Discussion: The findings indicate a statistically significant reduction in WBIS scores across the entire sample from T1 to T3, regardless of participation in the cognitive dissonance intervention. This suggests that the broader CBT-OB approach employed, and the weight loss may effectively reduce internalized weight stigma, with the cognitive dissonance intervention providing no additional benefit over standard treatment.

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AD02.03

"She is probably on Wegovy" – a qualitative study exploring experiences and perceptions about using weight loss medication in a rural setting in Denmark

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Introduction: Obesity has become a global health crisis, affecting over one billion people worldwide. The pharmacological treatment of obesity, such as Semaglutide (Wegovy), has gained increasing attention due to its efficacy in weight loss when combined with lifestyle interventions. However, while clinical studies have focused on the medication's effectiveness, little is known about the personal experiences of patients, especially in rural settings. This study aims to explore patient experiences with Wegovy treatment in a rural Danish context.
Methods: This qualitative study employed semi-structured interviews to investigate patient experiences with Wegovy in a rural Danish municipality. Nine participants, recruited from a local general practice clinic, were interviewed between February and March 2024. The sample included six women and three men, aged 33-65, who had been undergoing treatment with Wegovy for at least two months. Data were analyzed using thematic analysis and systematic text condensation, which allowed for the identification of key themes relating to social, psychological, and physical impacts of the treatment.
Results: The study identified four primary themes: (1) Community Perceptions and Stigmatization, where participants reported feeling judged and stigmatized by their local community for using pharmacological weight loss treatments. Many participants experienced negative comments such as "cheating" and had to defend their choice of treatment, leading to feelings of mental exhaustion and social withdrawal. (2) Mental and Physical Health Impacts, where the majority of participants noted improvements in energy levels and daily functioning, although some reported gastrointestinal discomfort and limitations on food intake. (3) Perception of Temporary Treatment, where most participants saw Wegovy as a short-term intervention rather than a permanent solution, with concerns about weight regain after discontinuation. (4) Financial and Social Considerations, where participants faced significant financial costs associated with the medication, leading to potential conflicts in family finances and priorities.
Discussion: The findings suggest that while Wegovy provides clear benefits in terms of weight loss and improved energy, its use is embedded in a complex social context in rural communities. Negative attitudes towards weight loss medication, perceived as an "easy way out," can significantly affect the patient experience and mental well-being. The concept of being a "lab rat" for science emerged as participants weighed the potential risks of new medication against the benefits. These experiences align with existing literature on bariatric surgery, which also encounters issues of stigmatization, though the use of medication rather than surgery introduces unique challenges. Additionally, the study's rural context limits the transferability of the findings, suggesting the need for further research in more urban or diverse settings to better understand the broader applicability of these results. A key strength of the study is the direct access to participants and the in-depth, personal nature of the interviews.

AD02.04

Patient voices: The role of psychological support in a behavioural intervention for people living with severe obesity (PROGROUP)

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Introduction: Research has previously mapped the psychological factors which may impact people living with obesity (e.g. stigma, depression, poor self-esteem). Given the current focus on pharmacotherapy for treating obesity, this study aimed to explore the role of psychology as part of alternative treatments, such as behavioural interventions. Patients taking part in a feasibility randomised controlled trial of PROGROUP, a group-based behavioural intervention for people living with severe obesity, were interviewed about their experiences as part of a process evaluation. Interview data was used to understand the role of psychological factors in living with obesity and the extent to which treatment helped patients to deal with psychological issues.
Methods: Eighteen patients (4 men and 14 women) from the PROGROUP feasibility trial were interviewed (12 intervention, 6 control), using semi-structured interviews. Data was analysed using an inductive thematic approach.
Results: Interview data have been divided into three preliminary themes: Contributing factors; Support and Retraining thinking. Patients cited several different psychological factors which they felt contributed to living with obesity, including negative affect and poor psychological well-being, life events, disordered eating and poor body image, and stigma. There was also a desire from both intervention and usual care patients for more psychological or emotional support and wanting to be listened to. For intervention patients, the group setting provided social support which helped with psychological wellbeing. However, while there were some cases of supportive treatment for usual care patients, there was a strong desire for more input. The intervention provided patients with the skills to retrain their thinking around food, negative self-talk and relapsing into old patterns.
Discussion: This data reiterates the role psychology has to play in treating people living with obesity. Patients had a strong desire for more psychological input, however intervention patients felt supported and found the skills of retraining their thinking useful. This demonstrates that behavioural interventions could offer the techniques and environment to aid psychological wellbeing. In the wider context of treating obesity, these results highlight that a holistic approach, with an emphasis on helping people deal with past events, stigma, disordered eating, low self-esteem and poor psychological wellbeing is needed alongside the current offerings of pharmacotherapy and surgery. Greater provision of psychological services could offer important avenues of much needed treatment for many individuals living with obesity.

AD02.05

Assessing the effect of an intensive lifestyle intervention on healthy and unhealthy behaviors in daily life for individuals with overweight and obesity

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Background: Obesity remains a major global health issue, and the effectiveness of treatment is not optimal. Currently, first line treatment for obesity is a standardized lifestyle intervention. Importantly, (factors affecting) lifestyle can vary greatly from person to person. This study aims to gain insight into the large variability in the lifestyle of people with overweight and obesity, and how lifestyle is affected by an intensive lifestyle intervention. This study measures (factors affecting) lifestyle in daily life using Ecological Momentary Assessment (EMA).
Methods: In this study, ultimately 200 participants with overweight and 200 with obesity will be included. Participants are randomized to an intensive lifestyle intervention (ILI) or an information control condition (INFO). At baseline and post-intervention, participants complete 3 weeks of EMA (8 moments/day), and body weight and waist-to-hip ratio are (self-)measured. The EMA protocol includes items on mood states, social context, sleep, eating and drinking behavior, and physical activity. Preliminary time series data of 110 participants will be analyzed to

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examine the effects of the ILI versus INFO condition, focusing on inter-group differences and inter-individual variability.
Results: Preliminary analyses of a smaller subgroup (*n*= 32) of the 3-week time-series data on lifestyle showed large heterogeneity both within and across weight categories. Both the ILI (*n*=18) and INFO (*n*=14) condition led to clinically significant weight loss. Importantly, large inter-individual variability in treatment effectiveness was observed with a mean weight loss of 3,7% (-17,0% to +1,8%) in the ILI and 3,6% (-21,6% to +4,5%) in the INFO group. We will compare the daily lifestyle behaviors of participants who benefited most and those who benefited least from the treatment. The preliminary analysis for example showed that participants who benefited most from treatment showed improvements in different daily lifestyle behavior (e.g., healthier food choices). We will present these analyses for *n*=110 participants, and will examine how treatment effectiveness relates to various individual factors. That is, how treatment effectiveness relates to baseline motivation, coach-coachee relationship (if ILI), and treatment satisfaction. Motivation is assessed using a combined questionnaire of the Behavioural Regulation in Exercise Questionnaire (BREQ-2) and Regulation of Eating Behaviour Scale (REBS)[1].
Conclusion: The large inter-individual heterogeneity in the measured lifestyle variables, at baseline and post-intervention, and large variability in treatment effectiveness measured as percentage weight loss, calls for a personalized approach to lifestyle interventions as treatment for obesity.

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AD02.06

Exploring the role of Adverse Childhood Experiences on Appetitive Traits in Adolescence: a prospective analysis

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Introduction: Adverse Childhood Experiences (ACEs) can significantly impact children's development and disease risk, including obesity. Appetite and eating behaviours may play an important role in explaining this association. However, there is a lack of studies testing this hypothesis. This study aimed to explore the association between ACEs and appetitive traits in adolescence.
Methods: Participants were from the Generation XXI birth cohort (n=4189). ACEs were assessed at age 10 with a self-administered questionnaire (15 items) and analysed by exposure categories (0, 1–3, 4–5, and ≥6) and dimensions identified through principal component analysis ('abuse', 'school problems', 'death/severe disease', 'life changes', and 'household dysfunction'). At age 13, appetitive traits were measured using the Children's Eating Behaviour Questionnaire (8 dimensions) completed by parents. Linear regression models, adjusted for sociodemographic factors, were used to estimate the associations.
Results: Ninety-six percent of participants reported at least one ACE, with 26% reporting ≥6. Participants who reported at least one ACE exhibited higher scores on food approach traits, indicating an avid appetite and strong interest in food. A dose-response relationship was observed between the number of ACEs and Food Responsiveness, Emotional Overeating, and Desire to Drink. Additionally, participants with ≥6 ACEs scored higher on Enjoyment of Food ($\hat{\beta}$=0.19, 95% CI [0.06, 0.31]) and Emotional Undereating ($\hat{\beta}$=0.13, 95% CI [0.01, 0.25]), and lower on Slowness in Eating ($\hat{\beta}$=-0.19, 95% CI [-0.32, -0.06]). Analyses by ACEs dimensions showed more consistent associations with food approach traits; the magnitude of the association was stronger for 'household dysfunction' and 'death/severe disease'.
Conclusion: A higher number of ACEs and different aspects of ACEs were associated with appetitive traits that predispose to a higher obesity risk, highlighting the potential role of appetite traits in explaining the link between ACEs and obesity. Effective prevention policies and public health interventions to mitigate the effects of ACEs are needed, particularly for the most vulnerable populations.

Conflict of Interest: None Disclosed

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AD03 - Pharmacological and Non-Pharmacological Modulators and Obesity Phenotypes in Childhood

AD03.01

What aspects of outcome measurement instruments are important to parents/caregivers in child health trials

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Introduction: Research findings inform understanding and prevention of childhood and adolescent obesity. Whether parents/caregivers and children take part in research might be influenced by factors such as parents/caregivers' perspectives and preferences for the outcome measurement instruments (OMIs) used to measure important child health outcomes. There is limited information on what aspects of OMIs influence participation in such research. The aim of this study was to conduct the first examination of what characteristics of OMIs influence parents/caregivers' decisions to participate in trials of interventions to prevent childhood illness and/or improve child health outcomes, including those related to physical activity, sedentary behaviours, and nutrition.
Methods: An online international cross-sectional survey was conducted with 490 parents/caregivers of at least one child aged ≤ 12 years. The survey utilized both closed and open-ended questions to evaluate what types of OMIs parents/caregivers would be most comfortable using to provide data in child health research. It also examined parents/caregivers' preferences for where (e.g., at home, in hospital), how (e.g., online, in-person), when (e.g., before or during medical visits), and with whom (e.g., healthcare professionals, researchers) data is collected in child health research. As this is an exploratory study, data were analysed using descriptive statistics.
Results: The ten most important characteristics of OMIs that influence parents/caregivers decision-making are: 1) potential risk to their child, 2) potential child discomfort, 3) ease of information provision, 4) potential benefit to others, 5) potential benefit to their child, 6) duration of data collection, 7) knowing what will happen to data provided, 8) clarity of instructions, 9) perceived importance of the research, 10) frequency of data collection. The preferred methods for providing information were online, in-person, and over the phone. Participants most preferred a healthcare professional collecting study information, followed by doing it themselves. Participants preferred to provide study information in their own time, followed by during a routine visit, and prior to a routine visit.
Conclusions: The findings suggest child safety, child comfort, and ease of providing information should be the highest priorities for trialists when designing and conducting data collection in child health research.

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Consideration of these factors in future childhood obesity research is crucial given the range of different measurement approaches used to assess, for instance, anthropometric outcomes, biomarkers, attitudes, beliefs and behaviours. Utilising appropriate and acceptable OMIs can improve recruitment, retention, and the experience of children and their parents/caregivers in research which can contribute to better understanding and addressing child health outcomes, such as childhood obesity.

AD03.02

Long-term Weight Changes in Response to Liraglutide in Adolescents in a Real-world Setting

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Introduction: Qatar has a high prevalence of childhood obesity and related comorbidities. Liraglutide is FDA-approved for weight management in patients with obesity who are > 12 years. Medication adherence poses a major barrier in practice and may impact long-term outcomes. Available real-world studies are limited by their short duration.
This study aims to address these gaps by assessing the long-term weight loss outcomes beyond 2 years in adolescents who received liraglutide for weight management and compare weight changes in adolescent who adhered to treatment compared to those who discontinued the medication for any reason in a real-world setting.
Methods: This retrospective study investigated long-term weight loss outcomes beyond two years in adolescents between 11 and 18 years old with overweight or obesity. Patients who were prescribed liraglutide for weight management at the National Obesity Treatment Center between 2017 and 2022 and had ≥ 1 follow-up visit beyond six months were included. Patients were excluded if they underwent bariatric surgery, were prescribed alternative medications, or had missing data. Patients were divided into two groups: those who adhered to liraglutide treatment up to the date of data collection and those who discontinued the medication for any reason.
The outcomes of the study were the nadir percentage change in body mass index (BMI) and the final percentage change in BMI from baseline until the date of data collection. Additionally, reasons for discontinuation were investigated.
Results: Of the 73 adolescents who were prescribed liraglutide and had at least 1 follow up visit, 42 adolescents met the inclusion criteria. Adolescents who received liraglutide achieved a median nadir percentage change in BMI from baseline of -6.4% [IQR -13.7, -2.2]. However, after approximately 4.3 years, this reduction was attenuated to a mean final percentage change of -5.0 ± 16.7. Seventeen adolescents adhered to long-term liraglutide treatment and were compared to the remaining 25 adolescents who discontinued the medication for any reason. Adolescents who adhered to long-term liraglutide treatment achieved a nadir percentage change in BMI from baseline similar to those who discontinued the medication (-8.9% [IQR: -13.2 to -2.8] vs. -4.5% [IQR: -13.8 to -0.7], p = 0.164). After a mean follow-up of 4.3 years, weight regain was observed in both groups, but no statistically significant difference was observed in the final percentage change in BMI from baseline between the two groups (-6.5 ± 17.2 vs. -3.9 ± 16.5, p = 0.483).
The reasons for discontinuation of liraglutide included undergoing bariatric surgery in 21 out of 73 adolescents (28.8%), switching to semaglutide in 4 out of 73 (5.5%), and gastrointestinal adverse events in 5 out of 73 (6.8%).
Conclusion: This study offers valuable insights into the long-term outcomes of liraglutide treatment in real-world settings, providing practical direction for clinical care.

Conflict of Interest: none

Funding: none

AD03.03

Serum Trimethylamine N-Oxide, a Predictor of Vascular Damage in Children Living with Obesity

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Introduction: Trimethylamine N-Oxide (TMAO), a gut-derived metabolite linked to cardio-metabolic issues in adults, may similarly contribute to vascular damage in children. This study investigates the relationship between serum TMAO levels and atherosclerosis markers in children living with obesity.
Methods: The study included 80 children aged 4–18 years: 55 children living with obesity and 25 with normal weight. HOMA-IR was interpreted by the puberty stage. Evaluations included BMI, waist circumference, waist-to-height ratio, puberty stage, and acanthosis nigricans. Arterial stiffness was assessed using pulse wave velocity (PWV), augmentation index (AIx), and blood pressure with a Mobil-O-Graph oscillometer. Subclinical atherosclerosis was evaluated using carotid intima-media thickness (CIMT) measurements with the Aixplorer MACH 30 echography device. Serum TMAO, HOMA-IR, fasting glucose, uric acid, creatinine, lipid profile, transaminases, and 25-OH-Vitamin D levels were analyzed.
Results: Children living with obesity had significantly higher TMAO levels, which correlated positively with BMI, waist circumference, and waist-to-height ratio, independently predicting these measures. TMAO levels were also associated with CIMT, PWV, and peripheral and central blood pressure, even after adjusting for BMI, Tanner stage, and age. Although HOMA-IR correlated with vascular markers, it did not correlate with TMAO. The latter showed an inverse relationship with fasting glucose. Children with acanthosis nigricans presented elevated TMAO levels (OR=1.14, p=0.03).
Conclusion: TMAO is strongly linked to vascular damage in children living with obesity, independent of HOMA-IR. The findings suggest TMAO may play a critical role in obesity-related vascular changes, warranting further research into its mechanisms and clinical implications for pediatric populations.

Conflict of Interest: None to disclose.

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AD03.04

A late chronotype associates with elevated BMI z-score throughout school age

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Introduction: Individuals exhibit diverse chronotypes. Having a late chronotype – that is, preferring to wake up late and having peak performance later in the day – has been associated with obesity, cardiometabolic diseases and increased engagement in obesogenic behaviors in adults (1,2). This study aimed to examine the association of chronotype with BMI z-score trajectories during school age.
Methods: We utilized data from the school-based Finnish Health in Teens (Fin-HIT) cohort with over 11,000 adolescents enrolled to the study during 2011–2014. The analytical sample consisted of 6260 adolescents (53% girls) with data available on chronotype and at least two BMIz

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measures between ages 8 and 16 years. BMIz were calculated according to IOTF reference (3) utilizing anthropometric data collected in the Fin-HIT as well as obtained from a national health register that includes measurements from school health examinations. At a mean age of 11 years, adolescents self-reported their sleep, diet, physical activity and screen time. We estimated their chronotype using the midpoint of sleep at weekends corrected for sleep debt accumulated during weekdays (4). We defined those in the 80th percentile of the continuous chronotype variable as having a late chronotype (n = 1007). The association between the chronotype (late vs others) and BMIz trajectories was examined using linear mixed models with the R package lme4.

Results: Mean BMIz across school age was 0.15 units (95% CI 0.09–0.21) higher among those with a late chronotype compared with others (main effect of chronotype $p < 0.001$) in the crude model and 0.08 units (0.02–0.14) higher in the model adjusted for sex, age at baseline, maternal socioeconomic status, and fruit and vegetable consumption frequency, physical activity, sleep duration and screen time ($p = 0.014$). No interaction between time and chronotype on BMIz was observed ($p > 0.2$).

Conclusion: The relationship between late chronotype and increased weight manifests already before adulthood, suggesting that obesity prevention could be targeted to children and adolescents with a late chronotype.

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AD03.05

Impact of Abdominal Obesity on Subcortical Brain Structures in Adolescents: The Role of Social Determinants of Health

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Introduction: Adolescents with obesity, particularly those experiencing abdominal obesity, often encounter significant effects on brain development, particularly in subcortical regions critical for cognitive and emotional regulation. Health disparities among children and adolescents living with obesity are frequently overlooked, contributing to broader social inequities. Understanding these factors is crucial for developing interventions to support better neurodevelopmental outcomes. This study investigates how obesity influences the volume of key subcortical brain regions, including the amygdala, hippocampus, caudate, accumbens, pallidum, putamen, and thalamus, using data from the Adolescent Brain Cognitive Development (ABCD) Study. The study also emphasizes the mechanisms of abdominal obesity, given its significant impact on cognitive development.

Methods: This study analyzed data from 3,320 participants in the ABCD Study, recruited across 21 U.S. cities and monitored from 2018 to 2020 through 2020 to 2022. Participants were categorized based on obesity status, with further stratification by the severity of abdominal obesity. Structural MRI scans assessed the volume of subcortical brain regions. Multivariate regression models were applied to evaluate the relationship between obesity status and brain structure volumes, with beta coefficients (β) and 95% confidence intervals (CIs) calculated for each region. Multilevel mixed-effects models estimated the adjusted β coefficients and CIs, controlling for age, sex, ethnicity, air pollution, population density, and baseline measures. Effect modification by social determinants of health (SDoH) was explored using the Child Opportunity Index.

Results: Adolescents with higher levels of abdominal obesity demonstrated significantly larger volumes in several subcortical regions, including the amygdala (β = 59.65, 95% CI = 6.32–112.99) and hippocampus (β = 64.83, 95% CI = 0.55–129.11), compared to their peers without obesity. Adolescents without obesity exhibited smaller volumes in these regions. The relationship between obesity and amygdala volume was particularly pronounced in individuals with very high obesity levels, suggesting a strong link between adiposity and emotional regulation. Other regions, such as the thalamus and caudate, also showed volume changes, albeit to a lesser extent. These findings highlight obesity as a critical factor in brain development.

Conclusion: Abdominal obesity is associated with significant changes in the volume of subcortical brain structures among adolescents, particularly in the amygdala and hippocampus. These effects were more pronounced among adolescents experiencing severe SDoH challenges. Such alterations in brain volume may influence emotional and cognitive functioning. Interventions to reduce obesity during adolescence may help mitigate these impacts, supporting healthier brain development and improved cognitive outcomes.

AD03.06

Reprogramming energy homeostasis in children with overweight and obesity through nutritional and physical activity interventions: a fNIRS study

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Ospedale Pediatrico Bambino Gesu

Introduction: Several studies reported a close association between childhood and adolescent obesity and cognitive deficits, as well as changes in the structure and the cortical thickness of prefrontal cortex (PFC), the brain area responsible for developing executive functions in children. This study aimed to investigate whether PFC activity in response to an Oral Glucose Tolerance Test (OGTT) changes after 8-weeks of lifestyle intervention and weight loss.

Methods: The PFC activity was recorded using near-infrared spectroscopy (fNIRS, Artinis Brite 24) at fasting and following the OGTT (min 10 to 30), before (T0) and after 8-week intervention (T1), on a sample of 10 children with overweight and obesity aged 7 to 11 years-old.The bilateral PFC activity was recorded in resting-state condition. Signals derived from 10 channels of each hemisphere were clustered into 4 different areas: frontal pole, dorsolateral prefrontal cortex (DLPFC), ventromedial prefrontal cortex, and frontotemporal cortex. After the pre-processing of raw signal, the oxy-hemoglobin and total-hemoglobin values (respectively corresponding to cerebral blood flow and volume) of resting-state was compared between pre- and post- sessions using 1000 permutations t-test. Finally, it was compared the delta PFC activity (post minus pre) between T0 and T1.

Results: PFC tended to have greater activation following the OGTT than in fasting condition at both T0 and T1(not statistically significant for FDR correction).Preliminary analysis between T0 and T1 suggested changes in the PFC activity in response to glucose load curve after the 8-weeks treatment ($T1 > T0$, $t = 4.36$, $p < 0.05$ FDR uncorrected: $\Delta HbO\text{-}T0 = -9.32$ nmol.l-1 vs. $\Delta HbO\text{-}T1 = 14.53$ nmol.l-1). These preliminary results highlight the potential impact of nutritional interventions combined with regular physical activity in modulating the prefrontal cortex's response to glucose.

Conclusions: Findings suggested that healthy lifestyle habits, i.e. Mediterranean Diet and regular physical activity, can modify/improve the PFC activity response to the glucose intake, potentially facilitating weight loss in children with overweight and obesity.

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AD04 - Obesity's Domino Effect: Unraveling Its Complications and Its Complications and Consequences

AD04.01

The prevalence of MASLD and risk of hepatic fibrosis in subjects with cardiometabolic risk factors: A nationwide study (DAHUDER MASLD STUDY)

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Introduction: Metabolic dysfunction–associated steatotic liver disease (MASLD) is the leading cause of liver-related morbidity and mortality, affecting more than 30% of the general population. MASLD is also a significant risk factor for major adverse cardiovascular events, and its prevalence increases with the presence of cardiovascular risk factors. This study aimed to determine the prevalence of MASLD and the risk of hepatic fibrosis among patients with cardiometabolic risk factors.

Methods: This nationwide study is a cross-sectional analysis of a prospective cohort of patients with at least one cardiometabolic risk factor in 34 cities and 44 internal medicine outpatient units representing all statistical regions of Türkiye. MASLD was defined as hepatic steatosis on abdominal ultrasonography with at least one cardiometabolic risk factor (i.e., high blood pressure, glucose, body weight, or blood lipids). The risk of hepatic fibrosis was noninvasively assessed with the Fibrosis-4 (FIB-4) index, and a score equal or over 1.3 was accepted as a high risk of liver fibrosis. People equal and over 18 years with at least one cardiometabolic risk factor were enrolled consecutively. The exclusion criteria were the presence of pregnancy, acute inflammation, malignancy, bariatric surgery, and the history of the specific causes of chronic liver disease such as high alcohol intake, viral hepatitis, and depot diseases.

Results: A total of 14371 patients (61.4% female, mean age 51.3 ± 14.4 years, body mass index 31.4 ± 6.0 kg/m2) with cardiometabolic risk factors were enrolled (Table). The overall prevalence of MASLD was 75.7%. The prevalence of high FIB-4 risk among patients with MASLD was 16.7%. The prevalence of MASLD and high FIB-4 score increased along with the increasing numbers of cardiovascular risk factors (Figure 1a, 1b). In the multivariable model, age (OR: 1.113, 95%CI: 1.106-1.120), female sex (OR: 1.540, 95%CI: 1.360-1.745), diabetes mellitus (OR: 1.229, 95%CI: 1.084-1.393) and hypertension (OR: 1.145, 95%CI: 1.007-1.302) were the significant independent associates of high fibrosis risk (Figure-2).

Conclusion: This nationwide report shows that MASLD is highly prevalent in subjects with cardiometabolic risk. The risk of MASLD increases along with the number of cardiometabolic risk factors. Among the population with MASLD, much attention should be given to those with older age, female sex, diabetes mellitus, or hypertension, as they are the ones with the highest risk of liver fibrosis.

Conflict of Interest: No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

Funding: This research received no external fundings.

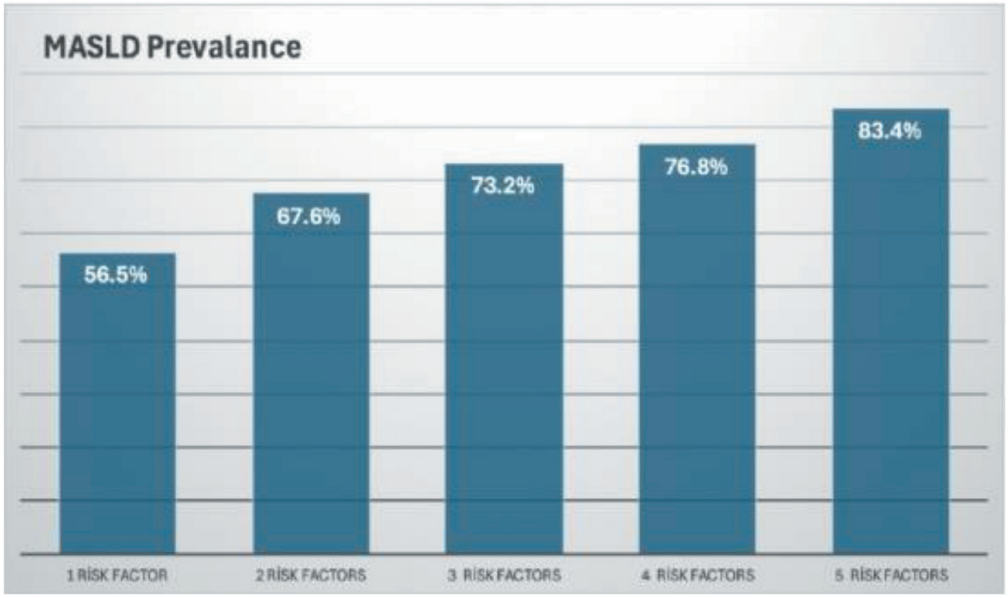


Fig. 1a. Prevalance of MASLD according to cardiometabolic risk factor density.

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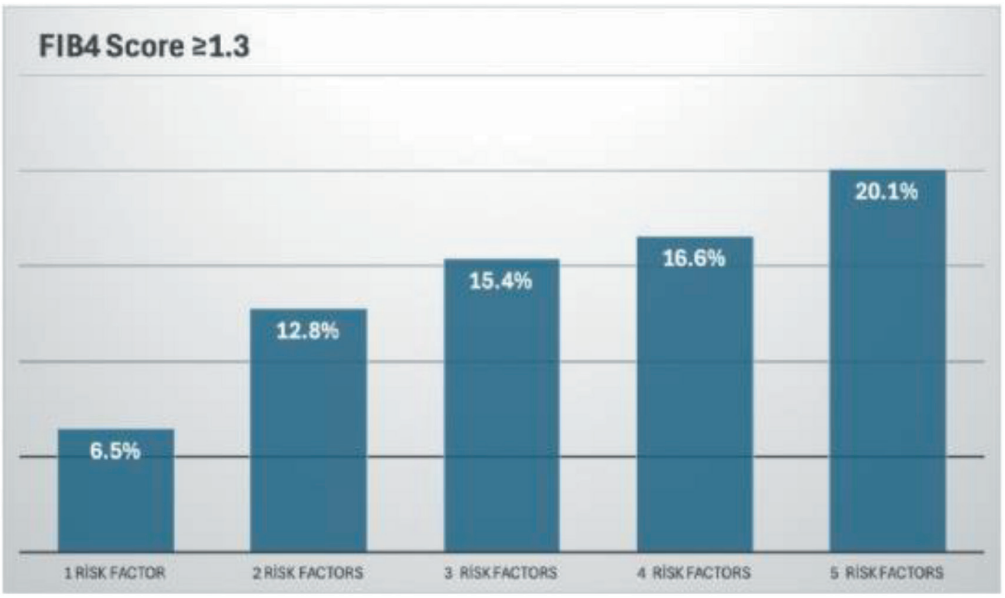


Fig. 1b. Prevalance of higher FIB-4 score among patients with MASLD according to risk factor accumulation.

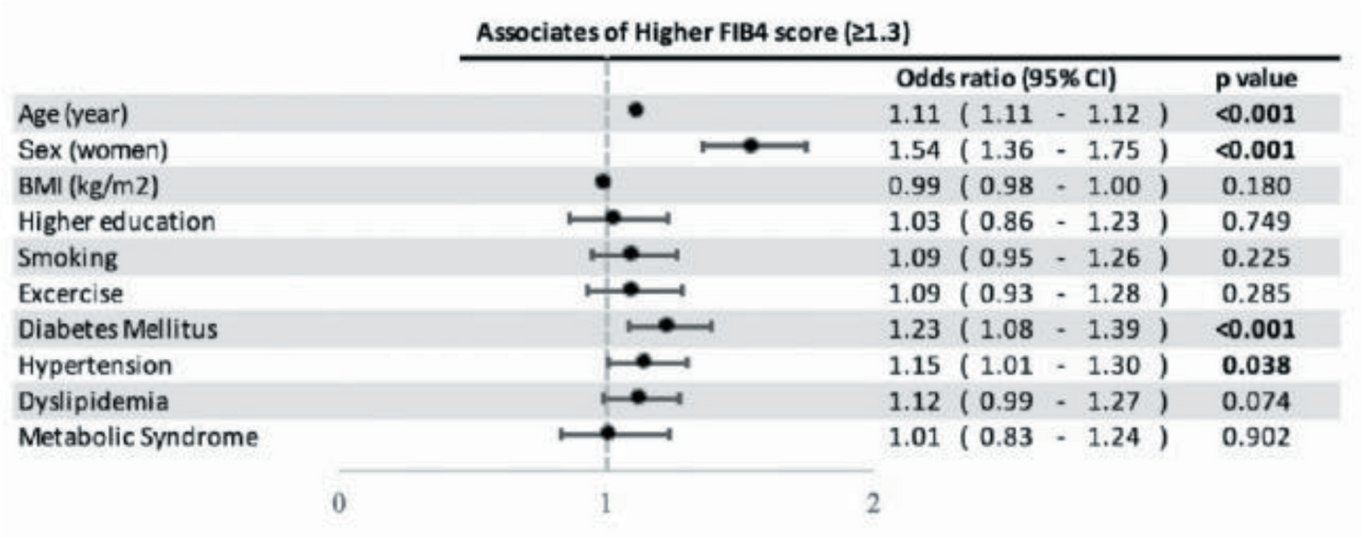


Fig. 2. The associates of higher FIB-4 score among patients with MASLD.

Tab. 1. Demographic and metabolic parameters of study population.

Variables	Total population n=14371	MASLD (+) n=10873 (75.7%)	MASLD (-) n=3498 (24.3%)	p
Age (year), mean ± SD	51.3 ± 14.4	51.4 ± 16.42	51.2 ± 13.6	0.442
Sex (women), n (%)	8827 (61.4)	6503 (59.8)	2324 (66.4)	<0.001
BMI (kg/m2), mean ± SD	31.4 ± 6.0	32.2 ± 10.0	29.1 ± 5.6	<0.001
BMI ≥ 25 kg/m2, n (%)	12877 (89.6)	10096 (92.9)	2781 (79.5)	<0.001
Education (university), n (%)	3365 (23.4)	2565 (23.6)	800 (22.9)	0.382
Smoking, n (%)	3996 (27.8)	3090 (28.4)	906 (25.9)	0.004
Excercise, n (%)	2804 (19.5)	1902 (17.5)	902 (25.8)	<0.001
Co-morbid diseases				
Diabetes Mellitus, n (%)	6181 (43.0)	4919 (45.2)	1262 (36.1)	<0.001
Hypertension, n (%)	6104 (42.5)	4765 (43.8)	1339 (38.3)	<0.001
Dyslipidemia, n (%)	6403 (44.6)	5183 (47.7)	1220 (34.9)	<0.001
Metabolic syndrome, n (%)	11544 (80.3)	9062 (83.3)	2482 (71.0)	<0.001

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AD04.02

Impact of changes in body weight, BMI, and fat mass on glomerular filtration rate over a 4-year follow-up: insights from the ILERVAS cohort

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Introduction: Obesity and related changes in body composition are known to influence renal function. The prospective ILERVAS study (ClinicalTrials.gov Identifier: NCT03228459) cohort provides a unique opportunity to investigate the impact of changes in body weight, body mass index (BMI), and fat mass (estimated via the Clínica Universidad de Navarra Body Adiposity Estimator, CUN BAE) on glomerular filtration rate (GFR) over a 4-year follow-up.
Methods: This longitudinal analysis included 3,225 participants from the ILERVAS cohort, recruited from the general population, with no known renal disease at baseline. The cohort had a mean age of 57.37 years, 48.23% were women, and the mean BMI at baseline was 28.96 kg/m². GFR was estimated using the CKD-EPI equation at baseline and follow-up, with an observed mean variation of ΔGFR = - -4.99 mL/min/1.73m² (IQR: -13.81 to 2.99) over 4 years. Changes in BMI, weight, and fat mass (CUN BAE) were calculated as differences between baseline and follow-up. Linear regression models were applied to assess the association of these changes with GFR variation (deltaGFR). Analyses were stratified by sex and age (<50 vs. ≥50 years).
Results: Reductions in BMI (β = -1.14, p=0.032) and CUN BAE (β = -1.07, p=0.009) were significantly associated with increases in deltaGFR. Specifically, a 1-unit reduction in BMI or CUN BAE was associated with an increase of 1.14 mL/min/1.73m² and 1.07 mL/min/1.73m² in GFR, respectively. The greater clinical impact of reducing fat mass, as represented by CUN BAE, suggests its role as a more sensitive marker of body composition in renal function. Stratified analyses revealed that in individuals ≥50 years, changes in BMI and CUN BAE were significant predictors of deltaGFR (p=0.035 and p=0.009, respectively), while weight changes were more impactful in younger individuals (p=0.007). Similarly, in women, reductions in BMI were the strongest determinant of improved GFR (p=0.030), whereas in men, weight changes showed a greater influence (p=0.001).
Conclusions: Our study highlights the differential impact of changes in body composition on renal function. While reductions in BMI and fat mass significantly improve GFR, the greater sensitivity of CUN BAE in detecting clinically meaningful changes underscores its value as a marker in managing obesity-related renal dysfunction. These findings support age- and sex-specific interventions targeting fat mass to optimize renal outcomes in at-risk populations.

AD04.03

European Recommendations from Health Care Professionals and People Living with Obesity on Safe Practice for Bariatric and Metabolic Surgery Medical Tourism: A Modified Delphi Consensus Statement from EASO, IFSO-EC and ECPO

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Background: Bariatric and metabolic surgery tourism (BMT) is becoming an increasingly popular route to treatment for patients living with obesity. Recent reports have highlighted that some patients travelling abroad for bariatric surgery have received inadequate care, fraudulent care, and, tragically, some cases have resulted in death. This study aimed to define consensus in Europe regarding safe practices concerning BMT.
Materials and Methods: IFSO-EC, EASO and ECPO initiated a task force to delineate safe practices in BMT. Two expert European panels were convened, one comprised of healthcare professionals (identified from EASO and IFSO-EC) and the other of patient representatives (identified from ECPO). The study utilised a modified Delphi consensus methodology, and 135 questions were administered. Surveys were conducted anonymously online, and consensus was defined as ≥70% agreement. Themes analysed regarding BMT included regulation, pre-operative evaluation, operative care, post-operative care, advertising and online information.
Results: One hundred and nineteen healthcare professionals and 88 patient representatives participated from 26 countries. The healthcare professional panel included 66 bariatric surgeons, 28 endocrinologists, 18 dietitians, three nurses, two psychologists, one general practitioner and one gastroenterologist. Three questionnaire rounds were conducted for the healthcare professional panel, and two were performed for the patient representative panel. Consensus recommendations were given across all themes relevant to BMT. These included evaluating and managing psychological health, sleep apnoea, cardiovascular disease, liver health and dietetic assessment. The recommendations covered the requirements for regulatory standards, including surgeon accreditation and procedural volume. They also included recommendations regarding patient education, standardised operative care, online information provision, and follow-up.
Conclusions: Through collaboration with healthcare professionals and patients living with obesity, we provide European recommendations regarding safe practices concerning BMT. Further evaluation is required regarding outcomes following BMT. These data, alongside the Delphi consensus recommendations, will inform BMT clinical guideline development.

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AD04.04

Impact of Glucagon-Like Peptide Receptor Agonists (GLP-1 RAs) on Pregnancy: An Integrative Evidence Review and Clinical Perspectives

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Background: GLP-1 Receptor Agonists (GLP-1 RAs) are effective in managing type 2 diabetes and people with obesity, offering benefits such as glycemic control, appetite regulation, and potential fertility improvements. Their increasing use among women of reproductive age raises concerns due to the high rate of unplanned pregnancies globally, estimated at 50%. Insulin remains the standard treatment during pregnancy, but the potential metabolic advantages of GLP-1 RAs warrant safety investigations. Current guidelines recommend discontinuing GLP-1 RAs at least two months before conception, given the uncertainty surrounding their safety during pregnancy. This review explores maternal, fetal, and neonatal risks associated with GLP-1 RAs.
Methods: An integrative literature review was conducted on the PUBMED database in December 2024, using the following search terms: ((“GLP1 receptor agonists” OR “glucagon-like peptide-1 receptor agonists” OR liraglutide OR semaglutide OR dulaglutide) AND (“Pregnancy”[Mesh] OR “Pregnant Women” OR “Gestation”) AND (“Safety” OR “Adverse Effects” OR “Reproductive Outcomes” OR “Congenital Abnormalities”[Mesh] OR “Neonatal Outcomes”) AND (“Diabetes Mellitus, Type 2”[Mesh] OR “Type 2 Diabetes” OR “Obesity”)). After screening titles and abstracts, 16 studies were excluded, and one additional article was incorporated, resulting in the inclusion of eight studies.
Results: Zhou et al. (2024) identified adverse events such as spontaneous abortion, preeclampsia, and threatened abortion. No significant dose-dependent differences were noted between liraglutide and semaglutide, though older women (≥35 years) had higher susceptibility to complications. Dao et al. (2024) found that most women exposed to GLP-1 RAs discontinued therapy by the 5th gestational week. Among these, BMI ≥ 25 kg/m² and comorbidities like hypertension and dyslipidemia were prevalent. The rates of major congenital malformations (MCM) were comparable to those in diabetes cohorts and lower than those with obesity. Similarly, Cest et al. (2024) reported MCM prevalence of 8.23% with adjusted risks akin to insulin. Preterm birth rates were lower in the GLP-1 RA cohort, though large-for-gestational-age neonates were more common. Despite an elevated hazard ratio for pregnancy termination, the miscarriage rates did not significantly increase. Kenneth Skov et al. (2023) found no teratogenicity with semaglutide but noted rebound weight gain after cessation.
Conclusion: The reviewed literature highlights that GLP-1 RAs are not recommended during pregnancy because of the risk of adverse events, such as spontaneous abortion and preeclampsia. Insulin is the preferred therapy for pregnant women with type 2 diabetes. Although GLP-1 RAs offer benefits for pregestational glycemic control, robust evidence supporting their safe use during pregnancy is lacking, emphasizing the need for further detailed studies.

AD04.05

Lights and shadows of bariatric surgery as from a nationwide administrative database of people living with type 1 diabetes

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Introduction: To describe the population of patients living with type 1 diabetes who had access to bariatric surgery (BS) in France, analyzing change in healthcare resource use and associated costs in the three years following this surgery.
Methods: An observational longitudinal study based on the French national health insurance database was conducted on all adult patients who underwent a first BS over 2015-2020. Cost-analyses were conducted on a sub-population who underwent BS during 2016-2017 for sufficient observation time using a pre-post methodology.
Results: A total of 437 patients were identified as living with type 1 diabetes among the 234,077 patients who had undergone surgery over six years (2015-2020). The most common types of intervention were sleeve gastrectomy (n=272; 62.2%) and gastric bypass (n=154; 35.2%) and patients were mostly women (77.8%) with a mean age of 42.3 (± 12.0) years old similarly to the general population undergoing BS in France. If no differences were observed in overall healthcare costs comparing the three years before and after BS, biological measurements were more frequently conducted and expenditures related to anti-diabetic drugs and insulin decreased significantly (p<0.0001). The number of hospitalizations for severe hypoglycemia, coma and ketoacidosis more than doubled in the three years following surgery compared with the period before (p=0.04).
Conclusion: The risks of severe hypoglycemia or ketoacidosis in patients with type 1 diabetes undergoing BS remains a real concern and emphasizes the importance of involving the diabetologist in the operative decision with joint follow-up with the nutritionist.

AD04.06

Maternal Weight and Delivery Mode Shape the Neonatal Gut Microbiota: Findings From The LIMIT Cohort Study at the Delivery

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Introduction: The first 1,000 days are critical for long-term health, with maternal and neonatal lifestyles and environmental exposures shaping the infant gut microbiota, a key element in foetal programming. Pre-pregnancy Body mass Index (BMI), gestational weight gain (GWG), and delivery mode (vaginal/C-section) strongly influence microbial colonization. As early microbiota drives immune development and metabolism, any disruption may increase health risks. Understanding these determinants is vital for developing strategies to promote health and prevent disease from the very beginning of life.
This cross-sectional analysis of the LIMIT cohort(1) aimed at investigating the impact of pre-pregnancy BMI, GWG and delivery mode on infant gut microbiota composition at delivery.
Methods: One hundred and eighty-one pregnant women were enrolled during the pre-hospital care before birth at Fondazione IRCCS Policlinico San Matteo (Pavia), according to the inclusion/exclusion criteria. Pre-Pregnancy BMI, GWG and delivery mode, were retrospectively collected. Participants were categorized into adequate (AGWG), excessive (EGWG), and low (LGWG) gestational weight gain groups, according to the IOM guidelines(2). 168 meconium samples were analysed using a targeted-sequencing approach, based on the 16S rRNA V1-V8 region (primer sequences 8F: AGRGTTYGATYMTGGCTCAG and 1391R: GACGGGCGGTGWGTRCA). The resulting metagenomic library was sequenced using the Oxford Nanopore platform (Oxford Nanopore Technologies, UK). Filtered reads were mapped to GTDB release 220 species-representative 16S rRNA sequences by length (archaea > 450 bp,

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bacteria > 650 bp). OTUs <0.1% abundance was discarded for denoising. All subsequent statistical analyses were conducted by using R software.
Results: We assessed changes in species diversity by permutation analysis based on maternal pre-pregnancy BMI, GWG, and mode of delivery. Analysis found no significant differences in bacterial diversity between the group with adequate and inadequate GWG and no association with pre-pregnancy BMI. However, we observed a significant increase in the relative abundances of the species *Clostridioides sp021561035* in the meconium of the offspring born from mothers with EGWG compared to those with AGWG. Additionally, a significant effect on diversity was found in the meconium of infants born by natural or C-section delivery. Meconium samples from infants delivered via caesarean section exhibited higher abundances of *Enterococcus faecalis* and *Staphylococcus epidermidis*.
Conclusion: Results highlight the low complexity of the microbiota in infant meconium, which is still in the process of forming and is strongly influenced by environmental factors. Maternal factors (GWG and delivery mode) play a significant role in shaping the neonatal gut microbiota. These findings underscore the role of early microbial colonization in long-term health and emphasize the need of optimizing maternal lifestyle and delivery practices to foster beneficial microbiota and reduce future health risks.

Monday, 12 May 2025

AD05 - Environment and Policy

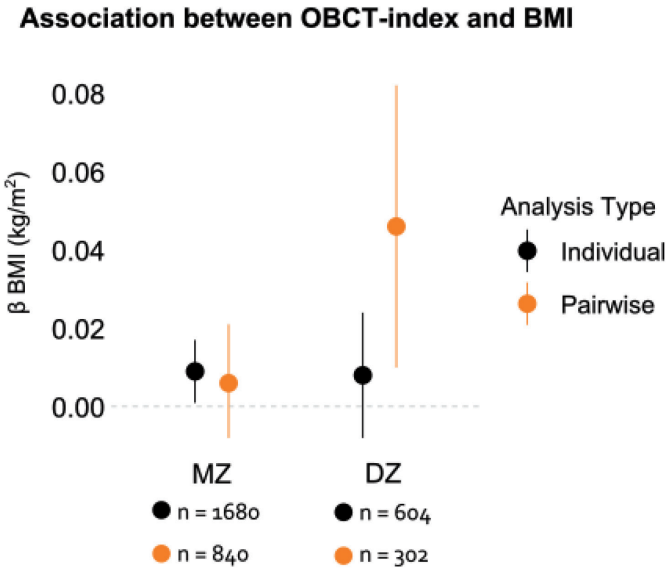
AD05.01

Investigating the quasi-causal association between the obesogenic environment and obesity: a twin study

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Background: Genetic and environmental influences play a key role in obesity development. To estimate the association between the obesogenic environment and obesity independent of genetic predisposition, it is essential to control for genetic factors and shared environmental factors. Twins can be considered quasi-experimental controls for genetic, family, cultural, and early life environmental effects. Therefore, this study aimed to investigate the phenotypic association between the obesogenic environment and BMI in adult twins, with and without controlling for these familial factors.
Methods: This cross-sectional twin study included 2758 adults (77% female, mean [SD] age 40 [14]) who participated in the Dutch Twin Registry (NTR) between 2009 and 2022, totaling 1379 twin pairs: 998 monozygotic (MZ) and 338 dizygotic (DZ) twin pairs.
We enriched the NTR dataset with the Dutch Obesogenic Built Environment CharacterisTics (OBCT) index, developed and provided by the Geoscience and hEalth Cohort COnsortium (GECCO). The OBCT-index consists of four equally contributing constructs: 1) food environment; 2) walkability index; 3) drivability index; and 4) sport facilities. The OBCT-index was calculated at a 1000 meter circular Euclidean buffer surrounding the residential address of the participants between ranged from 0-100. A larger OBCT-index value implies a more obesogenic environment.
We performed individual and pairwise analyses between the OBCT-index and BMI controlling for age, sex, education, and neighborhood socio-economic position. First, the association between the OBCT-index and BMI was assessed in individuals with univariate linear mixed models (i.e., individual analyses). For the pairwise analyses, we divided the twin pairs into co-twins with a lower OBCT-index score and co-twins with a higher OBCT-index score (none had identical OBCT-index scores), and calculated the within-twin-pair differences in OBCT-index and BMI. We then performed a linear regression between the OBCT-index and BMI difference values. A within-twin-pair difference is inherently controlled for otherwise confounding influences of familial confounding factors (e.g., DNA, age, sex, race, and shared early life environmental factors).
Results: Living in a 10% higher OBCT-index environment was associated with a mean [95% CI] 0.08 [0.004, 0.16] kg/m² higher BMI in MZ twin individuals (R^2 = 0.2%; Figure). However, this association was attenuated and no longer significant in the pairwise MZ twin analyses (R^2 = 0.1%). In DZ twins, a 10% higher OBCT-index was associated with a 0.46 [0.10, 0.82] kg/m² higher BMI in the pairwise analyses.
Conclusion: This study found a small association between a more obesogenic environment and a higher BMI in MZ twins, yet the association was explained by familial confounding, and therefore not quasi-causal. However, research on environmental exposures require larger sample sizes to detect robust associations.



Estimates include beta values with 95% confidence intervals.
OBCT = Obesogenic Built Environment CharacterisTics,
BMI = body mass index, MZ = monozygotic, DZ = dizygotic,
n = number of individuals (black) or pairs (orange).
Individual analysis = linear mixed model,
pairwise analysis = linear regression.
All analyses were corrected for age, sex, education, neighborhood socio-economic position.

Fig. 1. The association between the OBCT-index (0-100) and BMI (kg/m2) in individual and pairwise analyses.

AD05.02

Neighbourhood food environment and mortality due to obesity related NCDs: A large-scale nationwide cohort study

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Introduction: Obesity-related non-communicable diseases (NCDs) are a leading cause of preventable deaths, driven largely by unhealthy diets. Growing evidence suggests that environmental factors are associated with dietary behaviours, health, and mortality. However, prior research often

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used small samples, cross-sectional designs. Furthermore, most studies have examined exposure to different food outlets individually, whereas people are exposed to multiple environmental factors simultaneously and isolating individual effects is challenging. This study examined the association between combined neighbourhood food environment exposure and obesity-related NCD mortality in adults.

Methods: We conducted a longitudinal cohort study using registry data accessed through Statistics Netherlands. We included 4,205,582 Dutch adults aged 40+ years at baseline (January 1 2006). The neighbourhood retail food environment was operationalised using the Food Environment Healthiness Index (FEHI, ranging from: -5 (healthiest) to 5 (unhealthiest). The index combines the density, distance, and healthiness of all food retailers in a 1000m circular buffer around the home address. Follow-up was calculated from baseline until the first in or out-of-hospital death due to any obesity-related NCD as recorded in the national cause-of-death and hospital discharge registries, death due to other causes, or end-of-study date (December 31 2019), whichever came first. We used adjusted Cox proportional hazards regression models to estimate hazard ratios and 95% confidence intervals. For each tertile of the FEHI, we calculated the attributable fraction among the exposed (AF) using the formula AF = (HR-1)/HR. We tested for effect modification using multiplicative interaction terms.

Results: Each ten percent increase in the FEHI score was associated with a 7.7% (HR: 1.077; 95%CI: 1.040 to 1.116) higher risk of death due to obesity-related disease. Individuals in the highest tertile had a 4.2% (HR: 1.042; 95%CI: 1.033 to 1.052). For individuals in the highest tertile 4,017 deaths could be attributed to their level of exposure, compared to the low tertile. Each ten percent increase in the FEHI score was also associated with a 6.8% (HR: 1.068; 95%CI: 1.023 to 1.115) higher risk of death due to cardiometabolic disease. The high tertile of the FEHI was also associated with a 2.3 % higher risk of death due to obesity-related cancer. Subgroup analyses showed that risks were higher for those who were male, younger and lived in more urbanised areas.

Conclusion: Exposure to an unhealthier neighbourhood food environment was associated with a higher risk of death due to obesity-related NCDs. These findings emphasise the importance of considering the food environment in public health strategies aimed at reducing obesity-related mortality.

AD05.03

Supporting people living with obesity and food insecurity to make healthy food purchases: Insights from UK food retailers

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Introduction: Food insecurity (lack of reliable access to affordable nutritious food) is robustly associated with obesity and adverse health outcomes and is a major public health concern across Europe. There is an urgent need to support people living with both obesity and food insecurity to make healthy food purchases, and previous research indicates that interventions based on lowering prices in retail settings were deemed most helpful (Stone et al., 2025). However, the retailer perspective on implementing these interventions is often overlooked and under-researched. Therefore, this study explored the perspectives, views, and experiences of major UK supermarkets on the acceptability and feasibility of using affordability interventions for healthy food purchasing.

Methods: In this pre-registered (https://osf.io/3kw6x) qualitative study, we conducted semi-structured interviews with seven senior supermarket nutritionists who represented 85% of the UK grocery market share. Data were analysed using reflective thematic analysis.

Results: All respondents reported that their business was strongly committed to supporting the health of their customers. However, there were multiple challenges associated with implementing interventions to promote healthy foods; these included profitability concerns, unpredictability of intervention outcomes, control being limited to own-brand products, customer intention-behaviour gap, and a perception that the business was already implementing sufficient support. Supermarkets approached the evaluation of their interventions in different ways, but all respondents expressed willingness to collaborate with academics and other retailers to optimise intervention evaluation.

Conclusion: Interventions to support people living with obesity and food insecurity to purchase healthy food require supermarkets to navigate multiple challenges. Findings highlight the need for a range of different intervention approaches and practice-based evaluation. Policy measures and regulatory frameworks that incentivise food retailers to prioritise health in an economically viable way are also needed.

Reference

Stone, RA., et al. (2025). Understanding the barriers to purchasing healthier, more environmentally sustainable food for people living with obesity and varying experiences of food insecurity in the UK. Food Policy (in press).

AD05.04

How Can Front-of-Package Nutrition Labels Shape Healthier Choices by Influencing Decision-Making Time

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Introduction: Front-of-package nutrition labelling (FOPNL) is a key tool for promoting healthier eating, thereby addressing a critical factor in obesity prevention. Effective FOPNLs provide quick, simplified nutrition information, recognizing that decision-making speed is critical, as intuitive and rapid choices often dominate shopping behaviour. Understanding how FOPNLs impact the consumer decision-making and comprehension time is essential to optimizing their design and maximizing their potential.

Methods: A choice experiment with a between-group design was conducted to assess consumer food choices based on healthiness (using FOPNLs), organic production and price. Participants from Germany (n=820) and Slovenia (n=821) were randomized into four groups, each exposed to a different FOPNL: Nutri-Score (NS), NutrInform Battery (NI), Multiple Traffic Light (MTL), or Nutrition Facts Table (NFT). Under time pressure (20s per choice), participants made 10 choices on breakfast cereals and yogurts. Additionally, ranking tasks assessed FOPNL comprehension, with timing measured covertly. The study also included questions on familiarity with FOPNLs. Timing was a key secondary outcome. Median times and their link to healthier choices were analysed.

Results: The choice experiment showed significant differences in decision-making speed across FOPNL groups and countries. Participants from Germany were generally faster in both food choices and healthiness ranking tasks compared to those from Slovenia. Across both countries, NS led to the quickest decisions, with median times of 10-11s, followed by MTL (12-13s), NI (12-14s), and NFT (15s). Similar patterns emerged in healthiness rankings, where NS required the least time for correct rankings, while MTL, NI, and NFT progressively required more time. Healthier choices were linked to decision times, with variations by FOPNLs. NS was most effective FOPNL within 10s decision time, but beyond this, longer decision times did not result in healthier food choices. In contrast, for MTL, NI, and NFT, healthier choices improved as decision

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times increased, up to the 20s (recommended time limit). These effects were more visible among participants familiar with tested FOPNL.
Conclusion: This study highlights how FOPNLs differ in their impact on consumer decision-making, with more intuitive labels like NS being processed faster and supporting healthier choices especially when making quick decisions. However, for individuals who take longer to decide, these labels may not offer additional support in making healthier choices. As attention spans in the general population continue to decline, intuitive FOPNLs may hold greater relevance for promoting healthier food choices broadly. Further research in real world settings is needed to fully understand their influence on consumer behaviour. These findings provide valuable new insights into FOPNL research and their potential role in addressing public health challenges like obesity.

Conflict of Interest: None Disclosed

Funding: Data collections were supported by national research programme "Nutrition and Public Health" (P3-0395, funded by Slovenian Research and Innovation Agency).

AD05.05

The health impacts of mandatory menu calorie labelling and sugar-sweetened beverage taxation in two European countries: A modelling study

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Background: Menu calorie labelling policy has been mandated for the first time in Europe in large out-of-home food businesses in England since 2022. This policy is now being considered for implementation in other European countries. However, there is a dearth of evidence on the potential impacts of mandatory menu calorie labelling in other countries in Europe and the extent to which this policy may provide greater benefits compared to widely implemented measures, such as sugar-sweetened beverage (SSB) taxation. Therefore, this study aimed to examine the likely population-level impacts of menu calorie labelling and SSB taxation on reducing obesity prevalence and cardiovascular disease (CVD) mortality, as well as socioeconomic (SES)-related inequalities in these estimates, in two European countries: Belgium and Germany.
Methods: We used microsimulation models to estimate the impacts of mandatory menu calorie labelling and SSB taxation over a 20-year simulation horizon (2022–2041) in Belgium and German populations aged 30-89 years. We created synthetic populations for both countries that mimic sociodemographic characteristics (age, sex, education), exposures (body mass index, energy and SSB intake), and CVD mortality using national data sources. For both policies, we modelled the impacts through assumed changes in energy intake due to consumer responses and food industry reformulation. Scenarios of partial (in "large" out-of-home businesses; ≥ 250 employees) and full (in "all" out-of-home businesses) implementations for mandatory menu calorie labelling, and different tax rates for SSBs (10%, 20%, 30%) were simulated. For each scenario, we estimated the change in obesity prevalence and the number of CVD deaths prevented or postponed.
Results: Compared to the counterfactual scenario (e.g., without additional policies), assuming policies' effects on both consumer and industry behaviour, menu calorie labelling applied to "all" out-of-home businesses was estimated to have bigger impacts than that achieved by implementing this policy in "large" out-of-home businesses only. Implementing menu calorie labelling in all out-of-home businesses would reduce obesity prevalence by 3.61 (95% uncertainty interval-UI: [2.78, 4.30]) and 4.28 (95% UI: [3.64, 5.06]) percentage points and prevent 1600 (95% UI: [400, 3800]) and 30000 (95% UI: [10000, 58000]) CVD deaths in Belgium and Germany over 20 years, respectively. Implementing higher tax rates for SSBs was estimated to yield bigger impacts. The 30% SSB tax was estimated to reduce obesity prevalence by 0.27 (95% UI: [0.17, 0.43]) and 0.27 (95% UI: [0.17, 0.39]) percentage points and postpone 2500 (95% UI: [800, 5200]) and 16000 (95% UI: [7500, 28000]) CVD deaths in Belgium and Germany, respectively. SSB taxation may have SES-related equitable impacts, while mandatory menu calorie labelling may not.
Conclusions: Both mandatory menu calorie labelling and SSB taxation were estimated to have substantial impacts in reducing obesity prevalence and preventing CVD deaths in Belgium and Germany. Implementing both policies will be important to prevent obesity and related CVD burden.

AD05.06

Food Fight Campaign - taking to the streets to stop unhealthy food marketing on public transport

Martin, J.; Sinclair, C.; Hardi, C.

Cancer Council Victoria

Introduction: A key element of a comprehensive strategy to prevent obesity in children and support nutritious diets is to implement policies to protect them from unhealthy food marketing. This can be implemented by national, state or local governments, depending on the levers available to reduce this marketing through particular channels. At the state level, one of the areas for potential action, is to restrict advertising of unhealthy food on state government controlled infrastructure, including public transport assets, as well as stops and stations, and outdoor advertising around schools.
Methods: This presentation will outline the development of a Victorian obesity prevention platform supported by key public health agencies, including a recommendation for the Victorian government to restrict unhealthy food marketing. It will describe the enabling policy frameworks both nationally and in Victoria that promoted this objective and lead to the development of a campaign led by Cancer Council Victoria to drive action on this issue.
The aim of the Food Fight campaign was to advocate for the removal of unhealthy food marketing on public transports assets and infrastructure, as well as within 500m of schools in Victoria. There were two phases of the campaign involving paid media strategies and development of media assets, the first including TV and digital, the second digital only. Public opinion data and learnings from the first phase of the campaign, were used to tailor the approach for the second phase. Research played a critical role, including an audit of the prevalence of unhealthy food marketing on public transport and within 500 meters of schools. This led to the development of toolkit for smaller local government areas to undertake their own research into the issue. Both phases of the campaign involved engagement with Members of Parliament, an supportive statement for organisations to demonstrate support as well as a range of actions for individuals' to take, including a personalised letter to outlined concerns about this issue to their local Member of Parliament and calling for action.
Results: More than forty public health and civil society agencies supported the campaign together with more than 13,000 Victorian signatories. There was strong engagement with the campaign calls to action, including 80 individual letter to local Members of Parliament. The research results of the audit of unhealthy food advertising generated significant media interest and aspects of this was used to launch both phases of the campaign. The s also been significant interest generated in local communities and local health units keen to explore this marketing in their local areas.

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The development of an audit toolkit to support this has provided the roadmap to undertake such a project.
Conclusion: The paid mass media campaign has finished, however the media, community and government engagement will continue to build on the momentum already established. Being able to demonstrate strong community support is critical to success.

AD06 - New Insights in Obesity Medications: SURMOUNT-5

AD06.01

SURMOUNT-5 Trial: Design, Rationale and Baseline Characteristics

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Introduction: Obesity care has entered a new era driven by continued advancements in scientific understanding of the disease and therapeutic innovations. Two approved effective obesity management medications (OMMs) are tirzepatide, a once weekly dual GIP and GLP-1 receptor agonist, and semaglutide, a once weekly selective GLP-1 receptor agonist. In the SURMOUNT and STEP clinical trial programs, treatment with tirzepatide and semaglutide, respectively, resulted in substantial body weight reductions in people living with obesity compared to placebo. The objective of the SURMOUNT-5 trial was to evaluate the efficacy and safety of tirzepatide compared to semaglutide in adults with obesity.
Methods: This Phase 3b, multicenter, randomized, parallel-arm, open labeled, active-comparator-controlled, 72-week clinical trial included adults living with obesity (BMI ≥30 kg/m2 or BMI ≥27 kg/m2 with at least one obesity-related complication) randomized (1:1) to tirzepatide maximum-tolerated dose (MTD) (10 mg or 15 mg) or semaglutide MTD (1.7 mg or 2.4 mg), self-administered subcutaneously once weekly for 72 weeks as an adjunct to a reduced calorie diet and increased physical activity. The trial was conducted at 32 clinical sites in the United States of America including Puerto Rico. The primary endpoint was percentage change from baseline in body weight at 72 weeks.
Results: This presentation will focus on the SURMOUNT-5 trial design and rationale, baseline demographics, and clinical characteristics of the participants enrolled.
Conclusion: The SURMOUNT-5 trial investigated the efficacy and safety of once weekly tirzepatide compared to semaglutide in people living with obesity.

AD06.03

Change in Cardiometabolic Parameters in People with Obesity Treated with Tirzepatide and Semaglutide: The SURMOUNT-5 Trial

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Introduction: The primary goal of obesity treatment is to prevent and manage obesity-related complications (ORCs). Many of the most common and burdensome ORCs are cardiometabolic, including hypertension, type 2 diabetes, dyslipidemia and atherosclerotic cardiovascular disease (ASCVD). In the SURMOUNT and STEP clinical trial programs, treatment with tirzepatide and semaglutide, respectively, resulted in significant body weight reductions and clinically meaningful improvements in various cardiometabolic risk factors in people living with obesity compared to placebo. While semaglutide has shown benefit in secondary prevention of cardiovascular outcomes in people with obesity in the SELECT trial, the ongoing SURMOUNT-MMO trial with tirzepatide will provide data for people with obesity both in primary and secondary prevention populations. The objective of this pre-specified analysis of the SURMOUNT-5 trial was to investigate and compare changes in cardiometabolic risk parameters during treatment with tirzepatide and semaglutide.
Methods: Adults with obesity (BMI ≥30 kg/m² or BMI ≥27 kg/m² with at least one ORC) randomized (1:1) to tirzepatide maximum-tolerated dose (MTD) (10 mg or 15 mg) or semaglutide MTD (1.7 mg or 2.4 mg), self-administered subcutaneously once weekly for 72 weeks as an adjunct to a reduced calorie diet and increased physical activity, will be included in this analysis. Tertiary endpoints included blood pressure, hemoglobin A1c, fasting insulin, and lipid parameters assessed at 72 weeks.
Results: This analysis will focus on changes in cardiometabolic parameters following 72 weeks of tirzepatide compared to semaglutide treatment in participants from the SURMOUNT-5 trial.
Conclusion: Results from this analysis will provide further evidence of the improvement in cardiometabolic parameters demonstrated by the currently available effective obesity management medications, tirzepatide and semaglutide.

AD06.04

Weight Reduction with Tirzepatide 15 mg versus Semaglutide 2.4 mg from the SURMOUNT-5 Trial

Aronne, L. J.[1]*; Horn, D. B.*[2]*; Le Roux, C. W.*[3]*; Dimitriadis, G. K.*[4]*; Falcon, B. L.*[4]*; Gomez Valderas, E.*[4]*; García Pérez, L. E.*[4]*; Senyucel, C.*[4]*; Dunn, J. P.*[4]

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Introduction: The SURMOUNT-5 trial is the first head-to-head trial for effective obesity management medications (OMMs) comparing the efficacy and safety of tirzepatide with semaglutide in adults with obesity. The current

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analysis aimed to compare tirzepatide at 15 mg with semaglutide at 2.4 mg for the mean percent decrease in weight in the SURMOUNT-5 trial.
Methods: SURMOUNT-5 was a Phase 3b, multicenter, randomized, parallel-arm, open-label, active-comparator controlled trial. Adults with obesity (BMI ≥30 kg/m2 or BMI ≥27 kg/m2 with at least one obesity-related complication) were randomized in a 1:1 ratio to receive treatment with tirzepatide maximum-tolerated dose (MTD) (10 mg or 15 mg) or semaglutide MTD (1.7 mg or 2.4 mg), self-administered subcutaneously once weekly for 72 weeks. All participants received counseling on a reduced calorie diet and increased physical activity. After randomization, participants underwent dose escalation per protocol with the intent to achieve and maintain maximum dose of assigned treatment. There was the option for the lower maintenance dose if maximum dose was not tolerated. This analysis compared tirzepatide 15 mg with semaglutide 2.4 mg for the change from baseline to week 72 in weight (percent change and absolute change, kg) and BMI. The percent change in weight in this analysis was a pre-specified additional secondary endpoint. Analyses used the efficacy analysis set for maximum dose (on-treatment reaching maximum dose of study treatment data in participants with ≥ 1 dose of study drug).
Results: The majority of participants in each treatment group tolerated the respective maximum dose. This analysis will investigate the change in body weight, for the participants who tolerated the maximum dose in this trial.
Conclusion: This analysis will show the body weight reduction for the doses of tirzepatide 15 mg and semaglutide 2.4 mg, which are the maximum doses approved.

AD06.05

A New Dawn in Obesity Care: Treat to Target, a Post Hoc Analysis of the SURMOUNT-5 Trial

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Introduction: Treat to target approaches have demonstrated better long-term outcomes for many chronic diseases over usual care. These approaches typically include treating to evidence-based targets, low disease activity, and/or clinical remission. Older guidelines for obesity management support individualized goals for weight reduction but do not emphasize treat to target. Various reasons have prevented a treat to target approach in obesity care including that most treatments, excluding bariatric surgery, do not provide sustained weight reduction beyond 5-10%, disease heterogeneity, and that shared-decision making has been underutilized in obesity care. Effective obesity management medications (OMMs) are proving greater opportunity for treat to target. The SURMOUNT-5 trial is the first head-to-head trial comparing two effective OMMs, tirzepatide and semaglutide.
Methods: SURMOUNT-5 was a Phase 3b, multicenter, randomized, parallel-arm, open labeled, active-comparator controlled clinical trial. Adults living with obesity (BMI ≥30 kg/m² or BMI ≥27 kg/m² with at least one obesity-related complication) were randomized in a 1:1 ratio to receive treatment with tirzepatide maximum-tolerated dose (MTD) (10 mg or 15 mg) or semaglutide MTD (1.7 mg or 2.4 mg), self-administered subcutaneously once weekly for 72 weeks as an adjunct to a reduced calorie diet and increased physical activity offered to all participants. The current analysis will assess the proportion of participants reaching proposed treatment targets at week 72.
Results: This presentation will focus on the analysis that determined the proportion of participants in SURMOUNT-5 trial who achieved proposed treatment targets.
Conclusion: Results from this analysis will provide further evidence of the potential opportunity that newer effective OMMs provide for the obesity field to consider a treat to target approach.

AD07 - Childhood Growth Patterns and Health Outcomes

AD07.01

Disease Patterns at Adult ages by Childhood BMI Group

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Introduction: Accumulating evidence supports that body size early in life impacts the subsequent risk of diseases in adult life. However, most studies have focused on single diseases rather than overall patterns of diseases. Therefore, we investigated whether sex-specific patterns of adult incident disease diagnoses across the lifecourse differed by childhood body mass index (BMI) group.
Methods: The study included 112,952 children (55,603 girls) from the Copenhagen School Health Records Register, born 1962-1996. Measurements of weight and height were available from regular school health examinations. Using the Centers for Disease Control and Prevention (CDC) criteria, BMI (kg/m2) at age 7 years was categorized as underweight (4.2% girls, 4.3% boys), normal weight (83.2% girls, 83.0% boys), overweight (9.2% girls and boys), and obesity (3.4% girls, 3.5% boys). Information on somatic and psychiatric diagnoses at ages 15-60 years were obtained from the National Patient Register and the Danish Psychiatric Central Research Register of hospital-contact based diagnoses during 1977-2023 using individual-level linkages. Sex-specific cumulative incidences of diseases were calculated by BMI group, while accounting for time trends in diagnoses. The 50 most frequently registered diseases for each BMI group were investigated.
Results: The mean expected number of diagnoses by age 60 years varied by childhood BMI group. Among women, the number was 18.2, 16.6, 14.7, and 13.2 for those with childhood obesity, overweight, normal weight and underweight, respectively. The corresponding numbers among men were 15.1, 13.7, 11.7, and 11.3. Among women with childhood obesity, the most common diagnosis before age 60 years was adult overweight, including obesity, (36.4%). The corresponding probabilities were 24.5% and 10.4% for women with childhood overweight and normal weight, respectively. Notably, incident diagnoses of mental, musculoskeletal, and genitourinary diseases were relatively common across all BMI groups. Among men with childhood obesity, the most common diagnosis before age 60 years was adult overweight, including obesity, (11.8%), whereas the probability was 5.1% and 2.2% among men with childhood overweight and normal weight, respectively. Among men with childhood overweight, however, musculoskeletal diseases were the most common diagnoses before age 60 years. These diagnoses were relatively common across all childhood BMI groups.
Conclusion: Adults who had childhood obesity, and especially women, have a higher probability of having a hospital-based diagnosis of overweight, including obesity, in adult life as well as other diseases than individuals without childhood obesity. Nonetheless, there were also many similarities in disease patterns across all childhood BMI groups. Taken

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together, our findings suggest that future research should consider examinations of associations between childhood BMI and patterns of disease.

Conflict of Interest: Unrelated to this work JLB has received consulting fees from Novo Nordisk A/S.

Funding: Research relating to this abstract was funded by The Novo Nordisk Foundation (Grant number NNF21OC0067346)

AD07.02

Childhood Body Mass Index Trajectories and Risk of Overweight and Obesity in Young Adulthood

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Background: Early-life weight growth is associated with obesity and subsequent cardiovascular risk in adulthood. Identification of specific age windows for body mass index (BMI) change across childhood that could be associated with obesity in adulthood is important for the timing of effective prevention strategies. We assessed the associations of BMI change from birth to 14 years with BMI and overweight or obesity in young adulthood

Methods: This study was embedded in an ongoing population-based prospective cohort study in Rotterdam, the Netherlands. Data on gestational-age-adjusted birth-weight and sex- and age-adjusted BMI standard deviation scores (SDS) at 2, 6, 10, 14 and 18 years was analyzed in 3,528 participants using multivariate regression models.

Results: Of all children with overweight or obesity at the ages of 2, 6, 10 and 14 years, 32.5%, 51.6%, 44.6%, and 56.1%, respectively, still lived with overweight or obesity at 18 years. Body mass index (BMI) at all these ages was, independent of other BMI measurements, positively associated with odds of living with overweight or obesity at 18, with the strongest effect estimate at 6 years (Odds Ratio (OR) 2.35 (95% Confidence Interval: 2.04; 2.72) per higher SD). For those in the highest BMI tertile group, decelerated growth between birth and age 2 years, and between age 2 to 6 was associated with similar odds of living with adult overweight or obesity as healthy, stable weight children (OR 1.10 (95% CI: 0.75; 1.63). Between the age windows 6 to 10 years and 10 to 14 years, those within the highest BMI tertile group had increased odds of adult overweight or obesity, regardless of growth direction, and these odds increased with age. The highest proportion of adults with overweight or obesity was observed within the group with consistently high BMI from age 10 to 14 (62.4% (SE 1.6)).

Conclusion: Increased BMI growth during early and late childhood is strongly related to the odds of living with overweight and obesity in young adulthood. Conversely, deceleration in BMI growth before age 6 in children living with increased BMI appears to be associated with similar risks of overweight and obesity as their peers with stable, average BMI. These findings emphasize the importance of monitoring and optimizing growth in young children, as changes in early childhood provide great opportunities for prevention of overweight and obesity in young adulthood.

AD07.03

Children with metabolically healthy obesity and their long-term risk of cardiometabolic morbidities up to young adulthood

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Introduction: Individuals with obesity who exhibit normal metabolic profiles are sometimes categorised as having metabolically healthy obesity. The necessity of obesity treatment in this subgroup is sometimes questioned. We aimed to investigate the risk of cardiometabolic morbidities in children with metabolically healthy obesity during their paediatric years and young adulthood, and to assess the impact of paediatric obesity treatment on this risk.

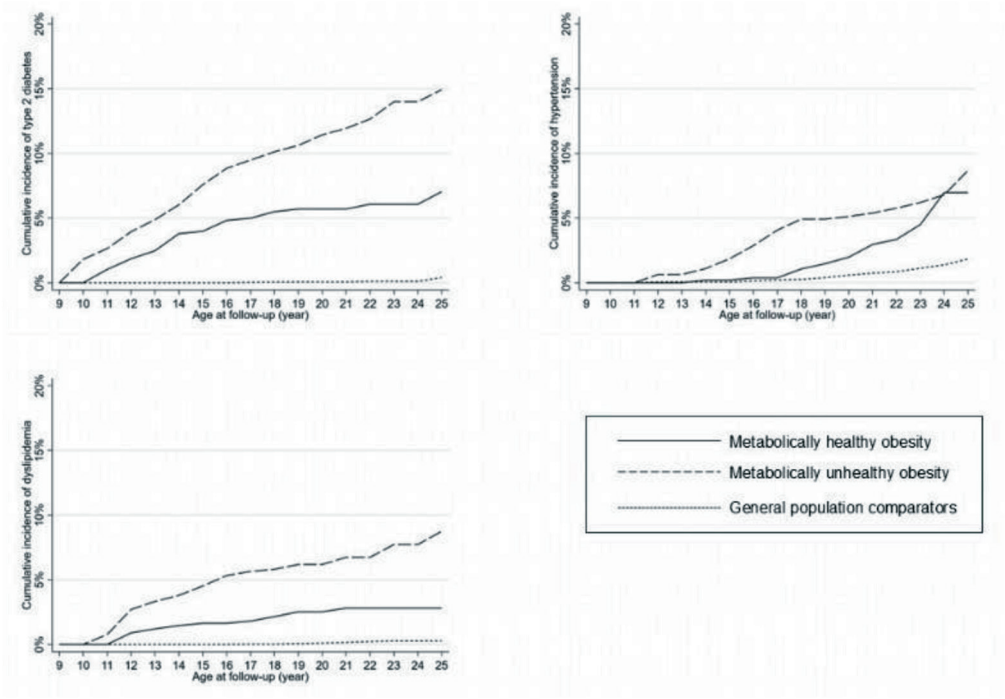
Methods: A cohort study using the Swedish Childhood Obesity Treatment Register (BORIS) (1996–2019) linked with national registers was conducted. Children aged 9-13 years who had cardiometabolic data at treatment initiation and received ≥1 year of obesity treatment were included. General population comparators were matched (ratio 1:5) based on sex, birth year, and residential area. The children in the obesity cohort were classified as metabolically healthy obesity (MHO) if they did not have high blood pressure, impaired fasting glycaemia, hypertriglyceridemia, or low HDL; otherwise, they were classified as metabolically unhealthy obesity (MUO). The outcomes were type 2 diabetes (T2D), hypertension, and dyslipidaemia, which were observed up to age 25 years. Good response in obesity treatment was defined as a reduction in BMI standard deviation score of ≥0.25 units and/ or obesity remission. To assess the effect of obesity treatment on the outcomes, Cox regression adjusted for sex, age at treatment start, and initial obesity class were performed.

Results: A total of 1,197 individuals in the obesity cohort and 5,780 individuals as the general population comparators were included. In the obesity cohort (58.6% female, median age: 12.3 years), 49.1% had MHO. No sex difference between MHO and MUO. MHO was 0.3 years younger than MUO.

By age 25 years, the cumulative incidence of T2D: 7.0% (MHO), 14.9% (MUO), 0.4% (general population); hypertension: 7.0% (MHO), 8.7% (MUO), 1.8% (general population); dyslipidaemia: 2.8% (MHO), 8.7% (MUO), 0.3% (general population comparators); all P log-rank <0.01. Within the obesity cohort, good obesity treatment outcome was associated with reduced risk of T2D (HR: 0.34 [95% CI: 0.15-0.76], P=0.009), hypertension (HR: 0.27 [0.10-0.78], P=0.016), and dyslipidaemia (HR: 0.07 [95% CI: 0.10-0.54], P=0.01). The protective effect of good treatment outcome was comparable between MHO and MUO (P for effect modification >0.05).

Conclusion: Children aged 9-13 years with MHO at treatment initiation have a substantially increased long-term risk of T2D, hypertension, and dyslipidaemia compared to their peers in the general population. Good response in paediatric obesity treatment in children with MHO reduces their cardiometabolic risk to the same extent as in children with MUO. Therefore, obesity treatment should be also recommended for children with MHO.

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Estimated cumulative incidence of type 2 diabetes, hypertension, and dyslipidaemia from age 9 to 25 years

Fig. 1. Estimated cumulative incidence of type 2 diabetes, hypertension, and dyslipidaemia from age 9 to 25 years.

AD07.04

Adverse Waist-For-Height Ratio Trajectories in Childhood are Associated with Cardiometabolic and Cardiovascular Risk by age 10

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COPSAC, Copenhagen Prospective Studies on Asthma in Childhood, Herlev and Gentofte Hospital, University of Copenhagen

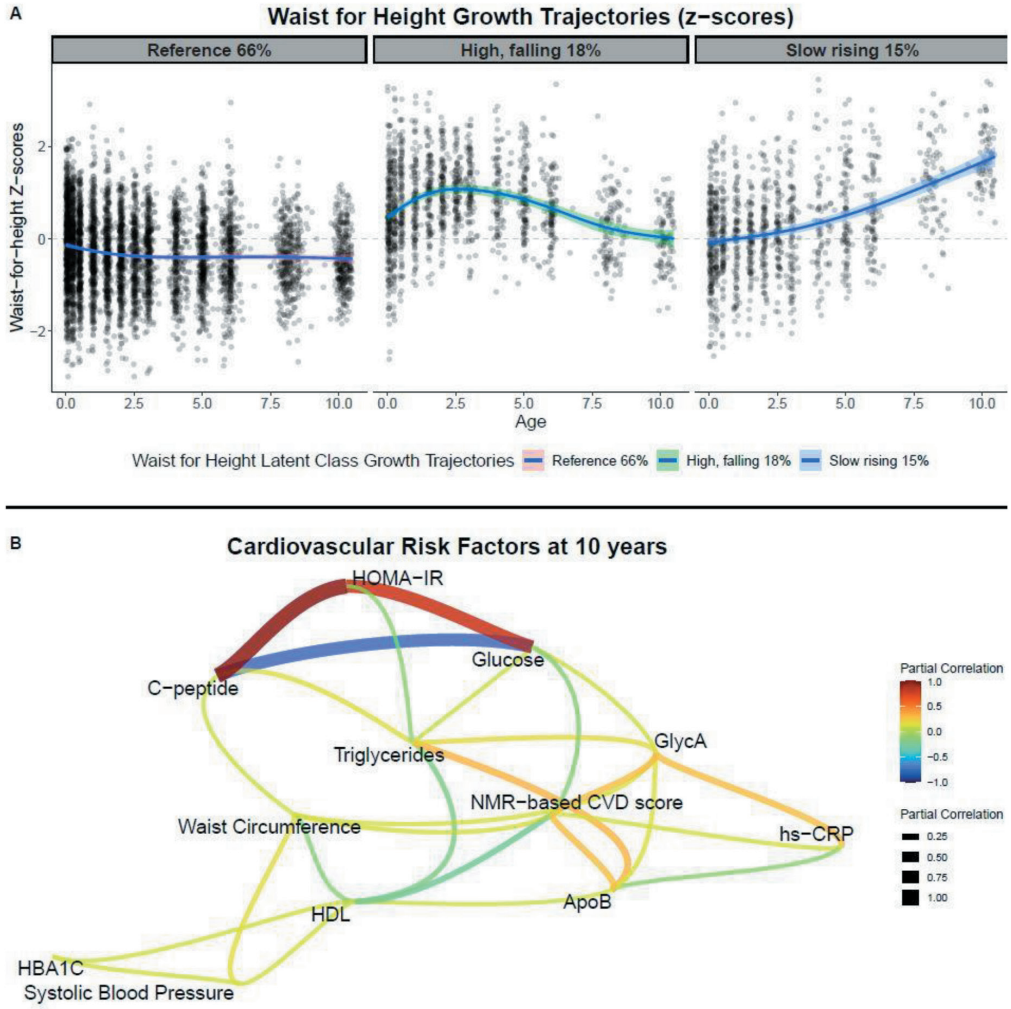
Introduction: Waist-for-height ratio reflects central adiposity, a key predictor of cardiometabolic health. This study examines how adverse waist-for-height trajectories in childhood are associated with increased cardiometabolic and cardiovascular risk by age 10.

Methods: Analysis was conducted within the COPSAC2010 cohort, comprising 700 mother-child pairs with detailed phenotyping across 14 visits. We used latent class analysis to identify child waist-for-height ratio trajectories from 1 week to 10 years. Cardiometabolic risk (CMR) was derived from composite z-scores of HDL, triglycerides, glucose, blood pressure (height-adjusted), and HOMA-IR, while cardiovascular disease (CVD) risk was calculated using NMR blood metabolomics and Cox models from the UK Biobank. Scores were z-scored within the cohort for interpretation. Models were adjusted for demographics, lifestyle factors, physical activity, sleep, diet, and relevant clinical measures.

Results: We identified three distinct waist-for-height ratio trajectories from 1 week to 10 years: a stable "Reference group" (66%), a "High, falling" group (18%), and a "Slow-rising" group (15%), as shown in Figure A. Compared to the reference group, the "Slow-rising" group (15%) had significantly higher CMR (β=0.79, p<0.0001) and CVD scores (β=0.53, p<0.0001), reflecting worse cardiometabolic risk. This group also showed elevated levels of C-peptide (β=106, p<0.0001), HOMA-IR (β=0.15, p<0.0001), GlycA (β=0.04, p<0.0001), and hs-CRP (β=0.60, p<0.0001), alongside lower HDL (β=-0.17, p<0.001). Cardiovascular risk factors and their interrelations are illustrated in Figure 1B, highlighting the significant contributions of markers such as HOMA-IR, triglycerides, GlycA, and ApoB to overall risk. Compared to the reference group, the "High, falling" group (18%) had significantly lower HbA1c levels (β=-0.90, p=0.003) and slightly higher ApoB levels (β=0.03, p=0.032). Adjusting for waist-for-height ratio at 10 years explained most of the variance in risk, rendering previous associations for the slow-rising group nonsignificant.

Conclusion: Childhood waist-for-height ratio trajectories are strongly linked to cardiometabolic and cardiovascular risk by age 10. These findings emphasise the need for early monitoring and intervention to address central adiposity patterns and reduce the risk of long-term adverse health outcomes.

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Panel A visualises the three data-driven weight-for-height ratio trajectories from 1 week to 10 years, at 14 clinical visits in the COPSAC2010 cohort. Panel B shows the signficiant (p<0.05) partial correlations between all the cardiometabolic and cardiovascular risk factors at the 10 year clinical visit.

Fig. 1.

AD07.05

Estimating the effect of overweight and obesity during adolescence on the risk of long-term comorbidities: a population-based retrospective analysis in England between 2008 and 2023

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Introduction: Overweight or obesity in adolescence are associated with early onset of comorbid conditions. We aimed to quantify the long-term risk of several neuro-psychiatric, physical and cardiometabolic comorbidities associated with overweight and obesity during adolescence in England. Additionally, we investigated the effect of change in body mass index (BMI) during adolescence on the onset of the same comorbidities.
Methods: Among adolescents aged 12-17 years registered at a Clinical Practice Research Datalink (CPRD) contributing primary care practice from 2008-2023, BMI readings were identified to define adolescents living with healthy weight, overweight and obesity using the UK 1990 growth reference centiles [1]. Adolescents were followed from the first BMI during adolescence to the earliest of transfer out of the primary care practice or the end of 2023, so patients reached a maximum age of 33 years during follow-up. The onset of new comorbidities during all available follow-up were identified in CPRD and linked secondary care data from the Hospital Episode Statistics. Risk of long-term comorbidities was compared between adolescents living with overweight or obesity and those with healthy weight using Cox proportional hazards regression. Additionally, among adolescents living with overweight or obesity, change in BMI between the ages of 12-14 and 15-17 years was calculated where BMI readings were available and defined based on a z-score change, or not, of ≥0.25. The risk of long-term comorbidities was compared between adolescents who had a reduced or increased BMI to those who maintained BMI, using Cox proportional hazards regression.
Results: Over a mean follow-up of 6 years, the risk (Figure 1) of many comorbidities was higher in adolescents living with overweight (n=139,258) or obesity (n=140,990) than those with healthy weight (n=560,789), specifically; obstructive sleep apnoea (3 [overweight] and 8 [obesity] times higher), type 2 diabetes (3 and 11 times higher) and metabolic dysfunction-associated steatotic liver disease (3 and 12 times higher), prediabetes (2 and 4 times higher)and polycystic ovary syndrome (PCOS) (2 and 4 times higher). Where BMI change could be calculated

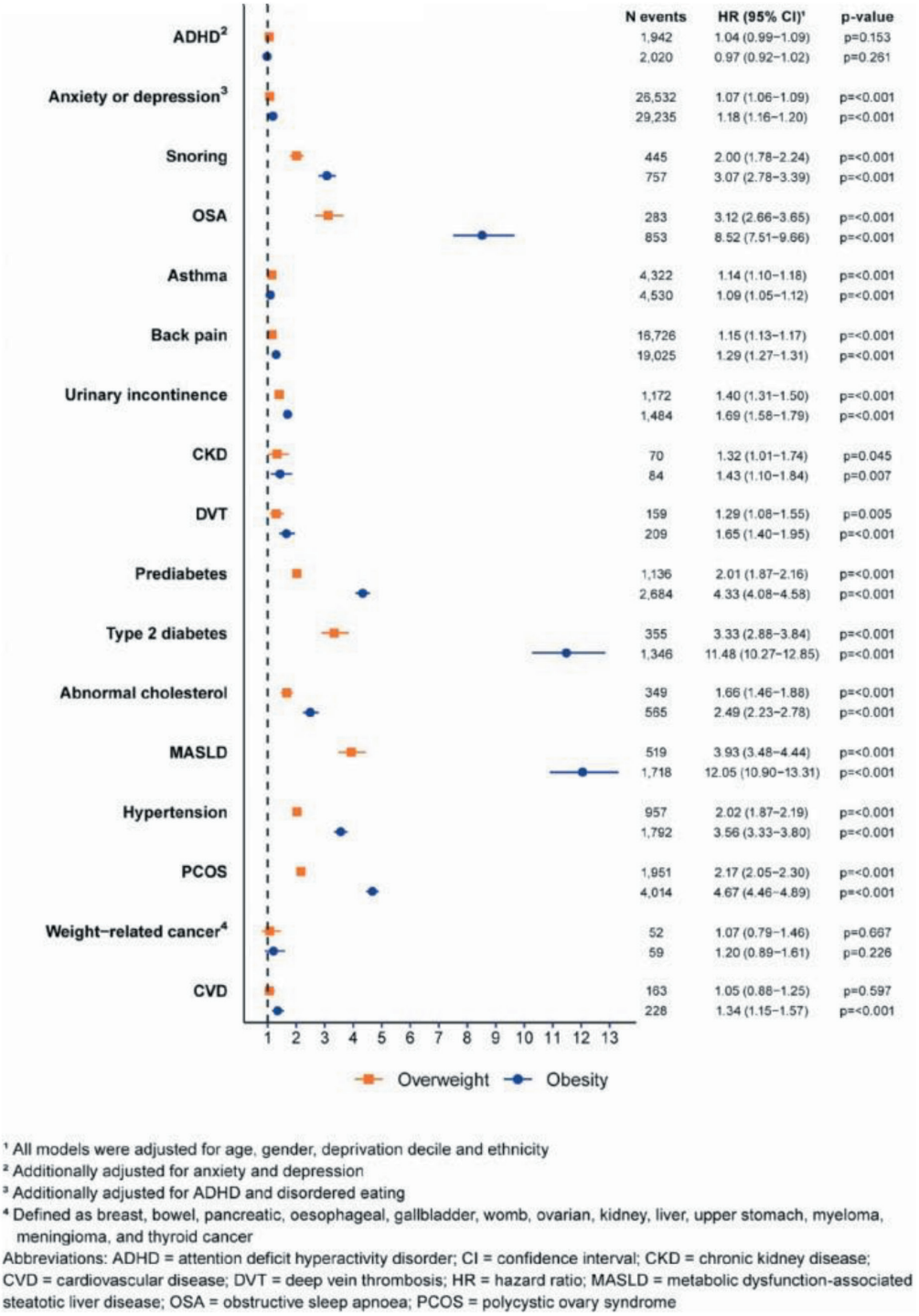
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(overweight: n=25,983, obesity: n=27,872), sizeable proportions of adolescents living with overweight or obesity had a reduced (42%, 34%), maintained (26%, 33%), and increased (32%, 33%) BMI during adolescence. Reduced or increased BMI was suggestive of lower and higher, respectively, risks for a number of comorbidities (Figure 2), particularly cardiometabolic conditions and PCOS.

Conclusion: For many weight-related comorbidities, overweight and obesity in adolescence are associated with a higher risk during both adolescence and adulthood. Change of BMI in adolescence may have long-term impact on the risk of developing comorbidities. Increased focus on weight-management in adolescence could lead to long-term improvement in overall health.

Reference

1. Cole TJ et al. British 1990 growth reference centiles for weight, height, body mass index and head circumference fitted by maximum penalized likelihood. Stat Med 1998; 17(4): 407-429.



¹ All models were adjusted for age, gender, deprivation decile and ethnicity
² Additionally adjusted for anxiety and depression
³ Additionally adjusted for ADHD and disordered eating
⁴ Defined as breast, bowel, pancreatic, oesophageal, gallbladder, womb, ovarian, kidney, liver, upper stomach, myeloma, meningioma, and thyroid cancer
Abbreviations: ADHD = attention deficit hyperactivity disorder; CI = confidence interval; CKD = chronic kidney disease; CVD = cardiovascular disease; DVT = deep vein thrombosis; HR = hazard ratio; MASLD = metabolic dysfunction-associated steatotic liver disease; OSA = obstructive sleep apnoea; PCOS = polycystic ovary syndrome

Fig. 1. Association between weight and comorbidities during long-term follow-up among adolescents living with overweight or obesity compared to adolescents with healthy weight, adjusted Cox proportional hazards regression.

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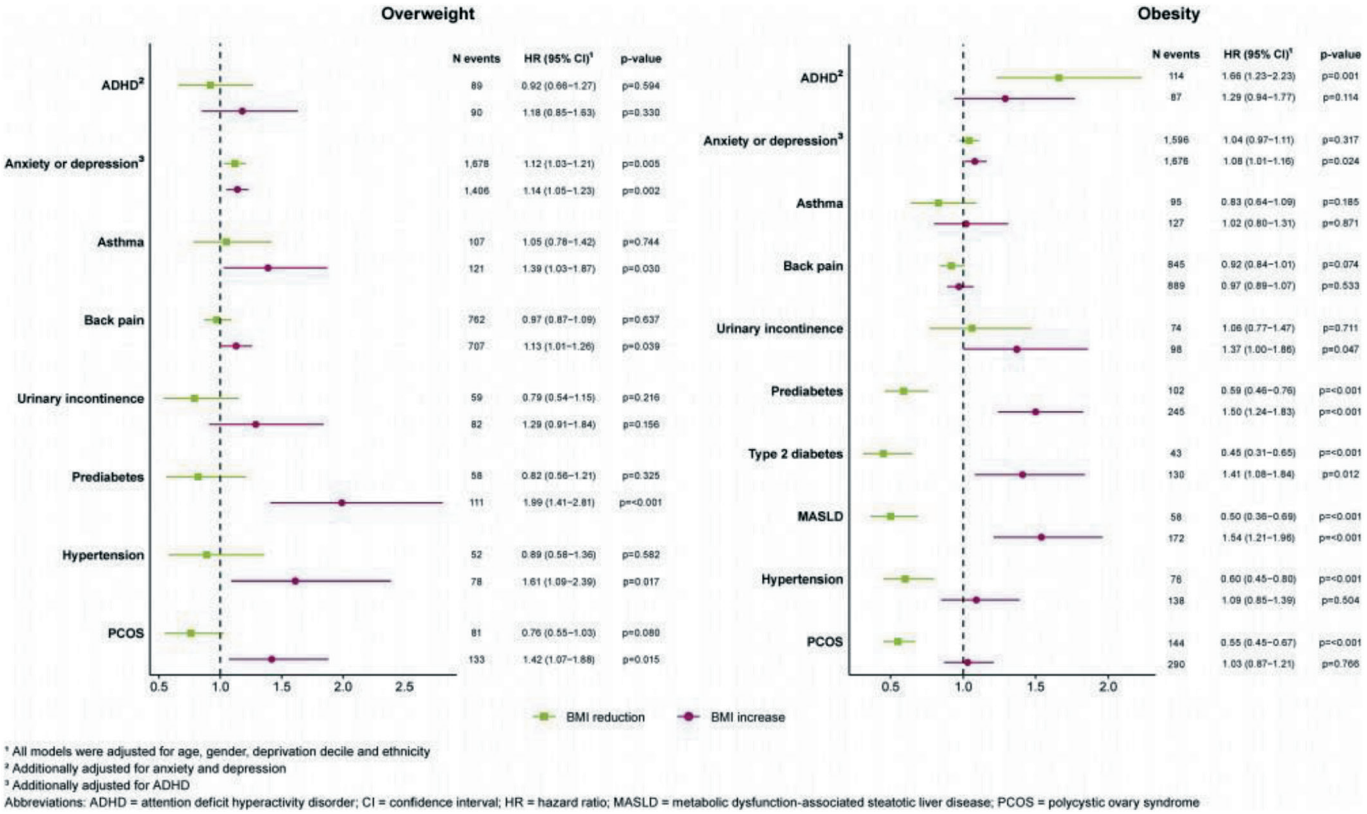


Fig. 2. Association between BMI change during adolescence and comorbidities during long-term follow-up among adolescents living with overweight or obesity, adjusted Cox proportional hazards regression.

AD07.06

Dual-Energy Xray Absorptiometry-measured Fat Mass in Adolescence but not in Childhood Predicts Worsening Cardiac Changes in 1803 Children - A 15-year Longitudinal Study

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Background: Longitudinal evidence on the dual-energy Xray absorptiometry measures of body composition from childhood with changes in cardiac structure and function in youth is limited due to few repeated echocardiography measures. This study examined whether the increase in total and trunk fat mass during growth from childhood through young adulthood is associated with the risk of progressive cardiac remodeling.
Methods: From the Avon Longitudinal Study of Parents and Children (ALSPAC), UK birth cohort, 1803 children aged 9 years who had repeated dual-energy Xray absorptiometry-measured fat mass at ages, 9, 11, 15, and 17- and 24 years clinic visits were included. Echocardiography at 17 and 24 years assessed left ventricular mass indexed for height (LVM).
Results: Each unit increase of total fat mass from age 9–24 years (β = -0.48g/m2.7 [95% CI, -0.50 – -0.48], p<0.001) and trunk fat mass (-0.78g/m2.7 [-0.83 – -0.74], p<0.001) were independently associated with progressively decreased LVM over 7 years. However, each unit increase of total fat mass from age 17–24 years (β = 0.12g/m2.7 [95% CI, 0.09 – 0.15], p<0.001) and trunk fat mass (0.23g/m2.7 [0.18 – 0.28], p<0.001) were independently associated with increased LVM. Each unit increase of lean mass from age 9–24 years (β = 0.31g/m2.7 [95% CI, 0.29 – 0.33], p<0.001) and body mass index (0.24g/m2.7 [0.20 – 0.27], p<0.001) were independently associated with increased LVM.
Conclusions: Increased total and trunk fat mass in adolescence but not childhood may predict cardiac structural and functional pathologies by young adulthood, whilst lean mass from childhood drives physiologic cardiac remodeling.

AD08 - InterOrgan Communication. Its All About Collaboration

AD08.01

Functional role of extracellular vesicles in the dynamic metabolic-tissue dialogue in obesity

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Introduction: In the pursuit of elucidating novel molecular mechanisms implicated in obesity, it is hypothesized that extracellular vesicles (EVs) secreted by cells and tissues of metabolic organs participate in a dynamic interplay that exacerbates the deleterious events associated with this pathological condition.
Objective: Having previously established the autocrine function of extracellular vesicles secreted by pathological adipocytes (obesesomes), we now aim to investigate the dynamic local and distant interplay between different metabolic organs and tissues (white and brown adipose tissues,

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and liver) through the secretion of their respective EVs: obesesomes, batosomes and hepatosomes.
Methods: EVs were isolated via ultracentrifugation from pathological cell cultures (obese adipocytes and steatotic hepatocytes), and from whole adipose tissue (subcutaneous and visceral adipose tissue extracted of persons with obesity) of patients undergoing bariatric surgery for functional interaction assays. The protein content of EVs from healthy and steatotic hepatocytes was analyzed using SWATH-MS proteomics. Brown adipocytes in culture were stimulated with cyclic AMP (cAMP) to obtain the resulting vesicles, heatosomes. Subsequently, insulin sensitivity and the expression of genes involved in lipid and glucose metabolism were analyzed through immunodetection and real-time PCR.
Results: Extracellular vesicles released from lipid-overloaded and insulin-resistant (IR) hepatocytes (steatosomes) demonstrate their capacity to induce IR in healthy hepatocytes. Consequently, protein cargo analysis of steatosomes revealed the presence of disease biomarkers associated with fibrosis, steatohepatitis, metabolic dysfunction-associated steatotic liver disease (MASLD), and hepatocellular carcinoma. Furthermore, EVs secreted by adipocyte cell models of obesity in culture and from whole adipose tissues extracted of persons with obesity (obesesomes) were shown to induce IR and alterations in glucose and lipid metabolism in cultured healthy hepatocytes. This pathological effect of human obesesomes was dependent on the clinical status of the donor patient, with viscerally shed EVs being the most deleterious. Notably, functional assays performed with EVs secreted by cAMP-activated brown adipocytes (heatosomes) demonstrated beneficial effects upon interaction with obese adipocytes.
Conclusions: EVs facilitate intra- and inter-organ communication between tissues involved in obesity by exerting metabolic and pathological effects that exacerbate established disease. Conversely, EVs derived from brown adipocytes activated with cAMP appear to contribute to the beneficial effects associated with this tissue. EVs secreted by steatotic hepatocytes contain liver disease-associated proteins.

Conflict of Interest: None Disclosed

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AD08.02

Exploring the relationship of GDF15 and FGF21 with glycemic control and aging, and their potential as biomarkers for type 2 diabetes in obesity

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Introduction: Obesity significantly increases the risk of developing comorbidities, with type 2 diabetes (T2D) being one of the most closely linked conditions. Elevated levels of growth differentiation factor 15 (GDF15) and fibroblast growth factor 21 (FGF21) have been associated with reduced food intake and increased energy expenditure, respectively, making these cytokines promising candidates for addressing obesity and its related complications. This study aimed to analyze the association between circulating concentrations of GDF15 and FGF21 with obesity, T2D, and aging.
Methods: Serum samples were collected from 405 participants, including 33 with normal weight and normoglycemia, 156 with obesity and normoglycemia, 157 with obesity and impaired glucose tolerance (IGT), and 59 with obesity and T2D. Participants had a mean age of 47 ± 13 years (range 21 to 70). Serum concentrations of GDF15, FGF21, adipokines (leptin and adiponectin), and other cardiometabolic risk factors were measured and analyzed for their association with obesity, T2D, and aging.
Results: Circulating concentrations of GDF15 and FGF21 were significantly elevated in participants with obesity (P<0.001 and P<0.05, respectively) and further increased in those with IGT (P<0.001 for both) and T2D (P<0.001 for both). The correlation between FGF21 and glucose 2 hours after an oral glucose tolerance test (r=0.46, P<0.001) and insulin (r=0.27, P<0.001) was stronger than the correlation between GDF15 and glucose 2 hours post-test (r=0.30, P<0.001) and insulin (r=0.16, P<0.01). By contrast, GDF15 showed a stronger association with age (r=0.55, P<0.001) compared to FGF21 (r=0.15, P<0.01). Notably, the FGF21/adiponectin and GDF15/adiponectin ratios were identified as effective biomarkers for detecting T2D, with AUC values of 0.807 and 0.779, respectively.
Conclusions: Circulating GDF15 concentrations are more strongly associated with aging, while FGF21 levels are more closely related to glycemic status. Additionally, the FGF21/adiponectin ratio is proposed as a novel and effective biomarker for predicting the presence of T2D.

Conflict of Interest: None disclosed

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AD08.03

Increased levels of miR-122 in the plasma due to obesity can be a contributor to inflammation and dysregulation of lipid metabolism in mature adipocytes *in vitro*

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Introduction: The prevalence of obesity and Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) are strongly correlated. An early event occurred in these diseases is the increased VLDL exportation from the liver into the bloodstream, which are responsible for transporting triglycerides, and also miRNAs, to extrahepatic tissues, mainly adipose tissue. The liver-specific miRNA, miR-122, which plays a role in the regulation of lipogenesis, is modulated in hepatocytes, and exhibits elevated circulating levels in models of MASLD and obesity, that can probably reach adipose tissue through VLDL transport. This study aimed to analyze the levels of miR-122 associated with different plasma transporters in patients with obesity and to evaluate the effects of miR-122 overexpression on adipocytes in vitro.
Methods: Participants were invited to join our research signing the Research Ethics Committee under the protocol CAAE: 44054421.7.0000.5404. After agreement, plasma was collected from patients in Hospital das Clínicas – UNICAMP, Brazil. miR-122 expression was evaluated by RT-PCR in plasma fractions (plasma, VLDL or exosomes) and C-peptide was determined by ELISA kit. 3T3-L1 cells were differentiated to mature adipocytes and transfected using lipofectamine RNAiMAX and miR-122 mimic (10nM) or a negative control for 24h, 48h or 72h. miR-122 and mRNAs levels were evaluated by RT-PCR.
Results: C-peptide levels were not different between Control (C) and Group with Obesity (Ob) demonstrating a normal insulin sensitivity, which is observed in patients with metabolically heathy obesity (MHO). Levels of miR-122 were increased in the plasma of Ob patients but were not different in the plasma fractions as exosomes and VLDL. However, it was the first time that miR-122 levels were detected in VLDL particles. It is known that there is an increase of VLDL export in the pathogenesis of MASLD, so the high levels of miR-122 in the plasma, can be occurred by the elevated concentration of VLDL in the plasma. As VLDL targets mostly adipose tissue cells, we evaluated the effects of overexpression

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of miR-122 in mature adipocytes (differentiated 3T3-L1 cells), and we observed a decrease of miR-122 target Agpat1, but an increase of Scd1 and Pparg, probably contributing to an enhanced levels of unsaturated fatty acids mainly, since there's no difference in Acaca levels. Genes related to b-oxidation were not different. Pro-inflammatory cytokines genes, as Il1b, Il6 and Tnf, were dramatically increased in the adipocytes transfected with miR-122 mimic. Ptpn1 levels were decreased, since it's miR-122 target, but genes involved in insulin signaling were not altered.
Conclusion: Levels of miR-122 were increased in plasma of MHO patients, probably because of an increased VLDL export to the bloodstream, which can reach adipose tissue. miR-122 overexpression in adipocytes leads to an increased inflammatory state, dysregulation of lipid metabolism with increased of unsaturated fatty acids synthesis.

Conflict of Interest: None.

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AD08.04

The ketone body β-hydroxybutyrate alters the methylome of breast cancer cells in vitro: A potential role for nutritional ketosis on counteracting obesity-related breast cancer

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Introduction: Obesity has been established as a significant risk factor in the pathogenesis and progression of breast cancer, correlating with a more unfavorable prognosis. The underlying mechanisms include chronic inflammation, metabolic alterations, and epigenetic modifications, which collectively contribute to a more aggressive tumor microenvironment. In this context, ketone bodies, particularly β-hydroxybutyrate (BHB), have emerged as potential therapeutic agents due to their metabolic, anti-inflammatory, and epigenetic properties, which could counteract tumor progression, especially in person with obesity. This study aimed to investigate the epigenetic effect of BHB on the modulation of the methylome associated with breast cancer, to elucidate its potential beneficial effect against the carcinogenic process and tumor proliferation.
Methods: Human breast cancer cell lines, specifically MDA-MB-231 and MCF7, were exposed to a concentration of 200mM sodium BHB salt for 72 hours in vitro, with renewal of the treated culture medium every 24 hours. Genome-wide DNA methylation assessment was performed using the Infinium MethylationEPIC BeadChip platform (Illumina).
Results: Exposure to ketone bodies induced significant alterations in global methylation profiles compared to control cells, as evidenced by unsupervised clustering analyses. In the MDA-MB-231 cell line, 292,180 DMCpGs were identified, of which 14% were located in CpG islands and associated with 194,425 genes. In MCF7 cells, 153,458 DMCpGs were detected, with 9% located in CpG islands and associated with 110,224 genes. Interestingly, following BHB treatment, over 90% of the identified DMCpGs in MDA-MB-231 exhibited hypermethylation, while in MCF7, more than 90% showed hypomethylation. Furthermore, a comparative analysis of the most significant DMCpGs (logFoldChange >0.2 and adjusted p-value <0.01) between both cell lines revealed 27 unique coincident genes, implicated in critical molecular pathways for mammary carcinogenesis, including cell cycle regulation, apoptosis, and cell signaling and adhesion. Of these, 4 genes (DDX25, LMF1, MYOM2, XKR6) exhibited loss of methylation compared to the control in both cell lines, while the remaining 23 genes showed opposite methylation patterns.
Conclusion: This study demonstrates that ketone bodies could act as potential therapeutic adjuvants in the treatment of obesity-associated breast cancer, as they can epigenetically modulate genes related to tumor proliferation, apoptosis, and metabolism. Our future research is directed towards validating these findings and evaluating these effects in clinical trials incorporating dietary interventions based on ketogenic diets in patients with breast cancer and obesity.

AD08.05

Circulating zinc-alpha2-glycoprotein (ZAG) response to acute insulin stimuli: insights into lipid and glucose metabolism

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Introduction: Zinc-alpha2-glycoprotein (ZAG) is a soluble glycoprotein primarily produced by adipocytes, playing a key role in lipid metabolism by promoting lipolysis, thermogenesis, and adipose tissue browning. ZAG levels are inversely correlated with obesity, insulin resistance, and metabolic syndrome, suggesting its potential as a therapeutic target. Previous studies revealed a downregulation of ZAG in obesity, while insulin has been proposed to suppress ZAG expression. However, the acute impact of insulin and feeding on ZAG regulation in humans remains unexplored. This study aimed to evaluate the response of circulating ZAG to three insulin-stimulatory dynamic tests (ISDTs) and assess the acute effects of insulin on ZAG production in cultured HepG2 cells.
Methods: Twenty-four healthy individuals (BMI <30 kg/m², no metabolic conditions) underwent three ISDTs: (1) oral glucose tolerance test (OGTT), (2) a standard meal test, and (3) intravenous glucagon administration. Serum ZAG, insulin, and glucose levels were measured at specific intervals. In vitro, HepG2 cells were treated with insulin (20 μIU/ml), and ZAG mRNA and protein levels were assessed via real-time PCR and Western blot. Statistical analysis included paired t-tests and ANOVA, with significance at $p<0.05$.
Results: ZAG levels decreased significantly in all ISDTs. During the OGTT, ZAG levels dropped from 42.1±18.3 μg/ml to 35.2±19.7 μg/ml at 90 minutes ($p<0.05$), coinciding with a peak in insulin (118.3±80.7 pmol/L). Similar reductions were observed in the standard meal test (31.5±14.9 μg/ml at 120 minutes, $p<0.05$) and glucagon test (34.4±17.0 μg/ml at 5 minutes, $p<0.05$). In HepG2 cells, insulin treatment acutely reduced ZAG mRNA and protein levels within 15 minutes, persisting up to 60 minutes before recovery at 120 minutes.
Conclusions: Our findings demonstrate that circulating ZAG levels decrease acutely in response to feeding and all three insulin-stimulatory dynamic tests, including oral glucose overload, a standard meal, and intravenous glucagon administration. This downregulation was mirrored in HepG2 cells, where insulin acutely reduced ZAG expression. These results suggest a novel mechanism by which insulin modulates ZAG, influencing lipid and glucose metabolism. Understanding ZAG's rapid insulin-mediated regulation offers new insights into the interplay between adipokines and energy homeostasis, highlighting its potential role in metabolic disorders. Further research should explore the molecular pathways underlying this acute response and its implications for obesity and insulin resistance.

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AD08.06

Effects of N-acylethanolamines on metabolic dysfunction and cellular stress responses driven by obesity

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N-acylethanolamines (NAEs) are endogenous lipids that belong to non-canonical endocannabinoids, playing a role in inflammation and energy metabolism regulation (Mock et al., 2023). NAE signaling is disrupted during obesity (Mazier et al., 2015), but the pharmacological effects of NAE associations in metabolic disorders are not well understood. Nutrient excess can activate stress-related mechanisms, such as autophagy dysregulation, mitochondrial dysfunction, oxidative stress, and accelerate cellular senescence, all processes which contribute to obesity-related disorders (Wellen and Thomson 2015). Targeting these cellular responses may be beneficial for obesity management. We investigated the role of OLALIAMID® (a mixture of NAEs derived from olive oil, with higher OEA content and lesser of LEA, PEA and SEA) in improving metabolic alterations in mice with obesity (induced by a high-fat diet, HFD). We also studied the effects of individual NAEs on autophagy, cellular senescence, mitochondrial dysfunction, and oxidative stress in different cell lines (HepG2, 3T3-L1, and primary murine fibroblasts). *In vivo*, OLA reduced body weight, fat mass, and insulin resistance (measured by HOMA index and leptin/adiponectin ratio) and improved serum lipid and hepatic profiles. Moreover, NAE mixture reduced fatty acid accumulation, and restored insulin signaling in liver of mice with obesity. OLA also induced thermogenesis in brown adipose tissue and promoted "beigeing" in white adipose tissue, increasing gene expression associated with adipose tissue remodeling. Additionally, OLA reduced IL-1β and GDF15 expression in iBAT and promoted the shift of adipose macrophages from M1 to M2 in subcutaneous adipose tissue of mice with obesity. In HepG2 cells, NAEs induced autophagy, as indicated by increased LC3-II expression and decreased p62 protein levels. NAEs also upregulated ATG3 and ATG7, which are involved in autophagy. Then, we used palmitic acid (PA), a major component of fat-enriched diets, to mimick obesity-associated cellular alterations. PA increased senescence markers (SA-β-gal, p21, p16) in ear fibroblasts and increased the percentage of SA-β-gal-positive cells while PEA (palmitoylethanolamide) reduced oxidative stress and downregulated p21 and IL-6, which are two tumor suppressors linked to senescence-associated secretory phenotype (SASP). Lastly, NAEs improved mitochondrial bioenergetics in HepG2 cells and 3T3-L1 adipocytes, restoring basal respiration, inducing proton leak, and modulating ATP-linked respiration. These latter findings suggest a protective effect of NAEs at cellular level that could be responsible for their beneficial effect on glucose and lipid dysmetabolism induced by obesity. The combination of NAEs can represent an effective pharmacological strategy for managing insulin resistance and the dysregulation of hepatic lipid metabolism associated with obesity. These effects likely stem from the modulation of meta-inflammation and of these cellular stress responses, including autophagy, mitochondrial function, and oxidative stress.

AD09 - Nutrition, Appetite/Energy Balance inc. Exercise

AD09.01

Accelerometry-measured walking sessions in older adults with overweight and obesity: associations with neighborhood walkability and social functioning

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Introduction: Walking outdoors is the most accessible and common forms of physical activity for older adults. Engagement in walking, however, depends on individual factors such as health status, gender, and social functioning, as well as environmental factors, like the built environment. Previous research in older adults with obesity in Palma de Mallorca demonstrated that local walkability significantly improved objectively measured total MVPA.

To expand on these findings, this study aimed to assess the relationship between the frequency, duration, and intensity of walking sessions, neighborhood walkability, and self-perceived social functioning in older adults living in Málaga province.

Methods: This longitudinal study included 427 seniors (ages 55–75) with overweight or obesity and metabolic syndrome from Malaga province, Spain.

The local walkability index for each participant's home was calculated as the sum of equally weighted standardized scores for population density, street intersection density, and daily living score, using GIS within a 1000 m buffer (approximately a 13-minute walking distance).Walking sessions were assessed annually using 7-day evaluations with wrist accelerometers. A heuristic algorithm was employed to identify sessions, linking continuous stepping with adjacent shorter stepping periods to allow for breaks. This approach accurately captured extended stepping during community and recreational walking while accounting for interruptions such as navigating traffic, greeting neighbors, or walking a dog. Social functioning was measured yearly using the SF-36 questionnaire.

We fitted a linear mixed-effects model using the lme4 package in R to investigate the independent associations of the walkability index, social functioning, gender, age, time in the study and BMI with walking session characteristics (frequency, duration, and intensity). Random intercepts were included for each patient to account for the repeated measurements over time. This hierarchical structure allowed us to control for intra-individual correlation in the repeated walking session asessments while evaluating the fixed effects of the predictors.

Results: A total of 214 women and 213 men (mean age: 64 ± 5.4 years, mean BMI: 31.8 ± 3.8 kg/m²) were assessed over 2091 weeks using accelerometry. On average, each person completed 1.77 ± 1.25 walking sessions per day, with a mean duration of 48 minutes.

Walking sessions were positively associated with neigborhood walkability, social functioning and negatively associated with BMI, being a woman and with increasing age.

Conclusion: This study highlights the significant roles of neighborhood walkability and social functioning in promoting walking frequency, duration, and intensity among older adults. These findings emphasize the importance of urban planning and community support in encouraging physical activity, particularly in populations with overweight and obesity.

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Tab. 1. Associations between neighborhood walkability, social functioning and walking session characteristics.

	Daily frecuency (n)		Total daily duration (min)		Mean Intensity (ENMO)	
	B [95% CI]	p	B [95% CI]	p	B [95% CI]	p
Walkability index	0.071 [0.023, 0.119]	0.004	2.359 [0.631, 4.088]	0.007	1.802 [0.294, 3.310]	0.019
Social functioning	0.005 [0.003, 0.008]	<0.001	0.114 [0.037, 0.191]	0.004	0.020 [-0.095, 0.135]	0.737
Gender (women)	-0.446 [-0.638, -0.253]	<0.001	-17.239 [-24.141, -10.338]	<0.001	-10.645 [-16.657, -4.633]	<0.001
BMI (kg/m^2)	-0.038 [-0.057, -0.019]	<0.001	-1.823 [-2.470, -1.177]	<0.001	-0.497 [-1.239, 0.246]	0.190

CI, confidence interval; p value; BMI, body mass index; ENMO, Euclidean Norm Minus One; B, Fixed effect coefficient.

AD09.02

Associations between dietary glycemic measures and dementia risk: the modifying role of body weight and fat distribution

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Introduction: Dementia, a progressive and incurable neurological disorder, is influenced by several metabolic and lifestyle factors, with obesity being a significant contributor. Obesity, particularly in terms of body weight and fat distribution, contributes to hyperinsulinemia, chronic inflammation and increased risk of type 2 diabetes, which are key factors in the development of Alzheimer's disease and other dementias[1]. In turn, carbohydrate intake strongly impacts blood glucose and insulin regulation, with glycemic index (GI) and glycemic load (GL) providing insights into postprandial glucose and insulin dynamics along with chronic inflammation. However, while the GI is independent of glucose tolerance status, evidence suggests that the overall postprandial glycemic response is exacerbated with higher body mass index (BMI)[2], thereby contributing to the onset and progression of dementia. The present study aims to investigate the association between dietary GI and GL and the risk of all-cause dementia, across different BMI levels and adipose tissue distribution patterns.
Methods: Data were obtained from the UK Biobank cohort. Dietary GL was calculated by multiplying the GI of each food item by its carbohydrate content, while daily GI was derived by dividing the GL by total carbohydrate intake. BMI and waist circumference categories were defined using anthropometric cut-offs. Cox regression models with restricted cubic splines were used to assess associations with incident dementia.
Results: After excluding participants with dementia at baseline, incomplete dietary data, implausible energy intakes, or unavailable genetic data, 202,044 participants were considered. Low dietary GI was associated with a 16% reduction in dementia risk among individuals without excess abdominal fat. No other significant associations were observed for GI or GL in individuals with normal BMI or without abdominal fat distribution. Among participants with higher body weight, a GI below the median exhibited protective effects (HR=0.802, 95%CI: 0.697–0.923), while GI and GL above the median were associated with an increased risk of dementia (HR=1.215, 95%CI: 1.021–1.447; HR=1.189, 95%CI: 1.002–1.411). Similar patterns were observed in individuals with higher abdominal fat, where low-GI was protective (HR=0.817, 95%CI: 0.673–0.991) and high-GL diets increased the risk (HR=1.305, 95%CI: 1.034–1.646).
Conclusion: Our findings suggest that low-GI diets may reduce the risk of all-cause dementia in individuals with higher body weight or abdominal fat, while high-GL diets are associated with an increased risk. These associations are not observed in individuals with normal weight. These findings underscore the importance of considering both carbohydrate quality and quantity in dietary strategies for dementia prevention among individuals with higher levels of adiposity.

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AD09.03

Food Biodiversity and Weight Variation: Associations in a French Cohort

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Background: 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/m^2) and obesity (among those with BMI ≤ 30 kg/m^2), 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.

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Mixed models revealed that higher DSR was associated with a decrease in BMI over time (β = -0.00834; p < 0.001). These findings remained robust after additional adjustments for food groups associated with weight gain.
Conclusion: 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.

AD09.04

The association of smoking with appetite, appetite-related hormones and energy intake: a matched-pair cohort study

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Introduction: Tobacco smoking is postulated to influence appetite, while weight gain during smoking cessation is a major barrier to successful abstinence. Previous research has identified marked differences in eating and dietary behaviours between smokers and non-smokers. However, there are a lack of human studies comprehensively exploring the appetite- and food reward-related mechanisms which could underpin these relationships. This study examined the associations of smoking with appetite perceptions, appetite-related hormones, food preferences, and eating traits. Unlike previous research, we directly matched our smoking and non-smoking groups for key confounding characteristics including age, sex, ethnicity, and BMI.
Methods: In a cross-sectional matched-pair cohort design, 25 smokers and 25 non-smokers were recruited and directly matched 1:1 by age, sex, ethnicity, and BMI. Across two laboratory visits, participants' food preferences (Leeds Food Preference Questionnaire), food cravings (Control of Eating Questionnaire), and eating traits (Three-Factor Eating Questionnaire) were assessed. Furthermore, fasting and postprandial appetite perceptions (visual analogue scales) were assessed during a 4-h mixed-meal tolerance test (MM-TT), while fasting and postprandial concentrations of circulating acylated ghrelin, total peptide-YY (PYY) and leptin (fasting only) were measured up to 2 h during the MM-TT. Differences in appetite-related outcomes between smokers and non-smokers were analysed using generalised linear models.
Results: In the finally adjusted models, explicit liking and wanting for high-fat foods and cravings for savoury foods were higher in smokers versus non-smokers (P < 0.065; ES > 0.52). Furthermore, cognitive restraint was lower in smokers versus non-smokers, while disinhibition was higher (P < 0.014; ES > 0.69). Smokers also showed lower fasting acylated ghrelin and lower postprandial total PYY compared to non-smokers (P < 0.041; ES > 0.58), whereas fasting leptin was similar between groups (P = 0.821; ES = 0.06). Additionally, smokers had higher fasting perceived ratings of fullness (P = 0.021; ES = 0.65), while no other fasting or postprandial differences were identified for the other appetite perceptions (hunger, prospective food consumption, satisfaction; P > 0.373; ES < 0.25).
Conclusion: In conclusion, smoking is associated with altered food preferences and less favourable eating traits, while more subtle differences may exist in appetite perceptions and appetite-related hormones. Future studies should investigate other potential influencing factors such as neurobiological mechanisms.

AD09.05

Comparison of retrospective and momentary dietary and physical activity measures in participants with obesity, overweight and healthy bodyweight

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Introduction: Improving lifestyle, i.e., dietary intake and physical activity, plays a major role in the treatment of obesity. Several methods available to assess lifestyle healthiness. Retrospective screening tools are subject to so-called recall bias and often overestimate healthy food intake and the amount of exercise. New smartphone-based methods such as Ecological Moment Assessment (EMA) reduce recall bias but take more time to collect data. Additionally, physical activity can be measured with wearables. In this study, we compare the results of each method and examine how time series data relate to retrospective survey data, and whether this differs per BMI group.
Method: Ultimately, 600 participants varying in bodyweight (obesity (BMI ≥ 30.0), overweight (BMI 25.0 - 30.0) and healthy BMI (BMI 18.5 - 25.0)) will be included in this study. All participants are asked to complete an online survey, including the Primescreen dietary tool (Rifas-Shiman et al., 2001) to assess dietary intake and the Exercise Vital Sign survey (Coleman et al., 2012) to assess daily physical activity. The Primescreen dietary tool was extended to include items that suit a vegetarian or vegan diet. Simultaneously, participants start 3 weeks of smartphone-based EMA (8 surveys per day) which includes items concerning food intake and physical activity. Participants also wear a Garmin smartwatch to measure physical activity. Preliminary analyses of time series data, Garmin data and survey data of 350 participants varying in bodyweight will be analyzed to examine how Garmin data and EMA data on lifestyle relate to retrospective survey data, and how this differs across bodyweight groups (healthy BMI, overweight, obesity).
Results-Conclusion: Analyses are still ongoing. We hypothesize that participants in all BMI groups overestimate their daily physical activity and healthy food intake in the retrospective surveys compared to the EMA. We hypothesize that this difference will be larger in the overweight and obesity group. Finally, the difference between the EMA data on physical activity and Garmin data is hypothesized to be smaller, but an overestimation of physical activity in the EMA data is still expected.

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AD09.06

Association between sodium intake, spot urine sodium concentration and obesity: a population-based study

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Background: Growing evidence suggests positive association between sodium intake and the risk of obesity. We examined the association between sodium intake, urine sodium concentration and both general and abdominal obesity in Finnish adults.
Materials-Methods: We used cross-sectional, population-based data of the National FinHealth 2017 Study (men=2222, women=2792, ≥18 years-old). Sodium intake was estimated using a validated food frequency questionnaire. Spot urine samples were collected from a subsample of participants (men= 558; women= 702). Body mass index and waist circumference were used to measure general and abdominal obesity. Sodium intake and urine sodium concentrations were stratified into sex-specific quartiles, and multinomial logistic regression analyses were conducted, adjusting for common sociodemographic and lifestyle confounders. In validity analyses, spot urine samples were compared against 24-hour urine collections.
Results: Participants with high dietary sodium intake or high urine sodium concentration were more likely to have general or abdominal obesity. In the fully adjusted model, women in the highest quartile of sodium intake were more likely to have general obesity (OR 4.30, 95% CI 2.60-7.12) or abdominal obesity (OR 3.42, 95% CI 2.11-5.56) compared with women in the lowest quartile. Similar associations were observed when urine sodium concentration was used as an independent variable. Men in the highest quartile of urine sodium concentration were more likely to have general obesity (OR 6.05, 95% CI 2.83-12.93) or abdominal obesity (OR 4.68, 95% CI 2.44-8.96) compared to men in the lowest quartile in the fully adjusted model. The validity analyses suggested a moderately good agreement between spot urine and 24-hour urine collections.
Conclusions: These results strengthen the evidence of an association between sodium intake and obesity, with similar findings observed for both dietary sodium and urine sodium concentration. It is important to gain more understanding about the biological mechanism of the relationship.

Conflict of Interest: The authors declare no conflict of interests.

Funding: No external funding was used for the research of this abstract.

AD10 - Revolutionizing Obesity Management: The New Era of Pharmacotherapy in Obesity

AD10.01

Safety, pharmacokinetics and pharmacodynamics of dual amylin and calcitonin receptor agonist colulintide (LY3541105) for chronic weight management: a phase 1 study

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Introduction: Colulintide is a potent dual amylin and calcitonin receptor agonist under development as a once-weekly SC treatment for chronic weight management.
Methods: This phase 1, randomized, placebo-controlled, dose-escalation study evaluated the safety, pharmacokinetics (PK) and pharmacodynamics (PD) of a single dose (part A) in healthy participants, and multiple doses with progressive dose-escalation (part B and C) in participants with overweight or obesity. Treatment duration was 12 weeks in part B and 10 weeks in part C. The primary objective was to evaluate safety. Part C results are presented based on the highest dose received by participants due to premature termination of dose escalation due to a serious adverse event (SAE).
Results: Parts A, B, and C included, respectively, 48, 113, 45 participants, with a mean age of 45, 46, 43 yrs, a mean BMI of 27.2, 32.0, 32.0 kg/m2, and 35, 23, 22% female. Body weight decreased dose-dependently from baseline, reaching a maximum decrease of -9.5% vs placebo at day 85 in the highest target dose cohort in part B and maximum decrease of -7.8% vs placebo at day 67 in the highest target dose cohort in part C. Two SAEs were reported: polydipsia-induced hyponatremia (part B highest dose cohort), and depressive mood with suicidal ideation (part C highest dose cohort), both resolving quickly after termination of dosing. A total of 5 subjects were discontinued early from the study drug due to AEs in parts B and C. Psychiatric disorder-related AEs including anxiety, irritability, and depressive mood +/- suicidal ideation, occurred in 6 subjects in parts B and C, with some evidence for dose-dependency, and caused early treatment discontinuation in 3 subjects. Gastrointestinal (GI) AEs, including nausea and vomiting, were dose-dependent, developed generally after the first dose, were most often transient, but caused early treatment discontinuation in 2 subjects. Other adverse events were generally mild and included decreased appetite, headache, fatigue, increased thirst, and injection site reactions. Colulintide's PK appeared in general

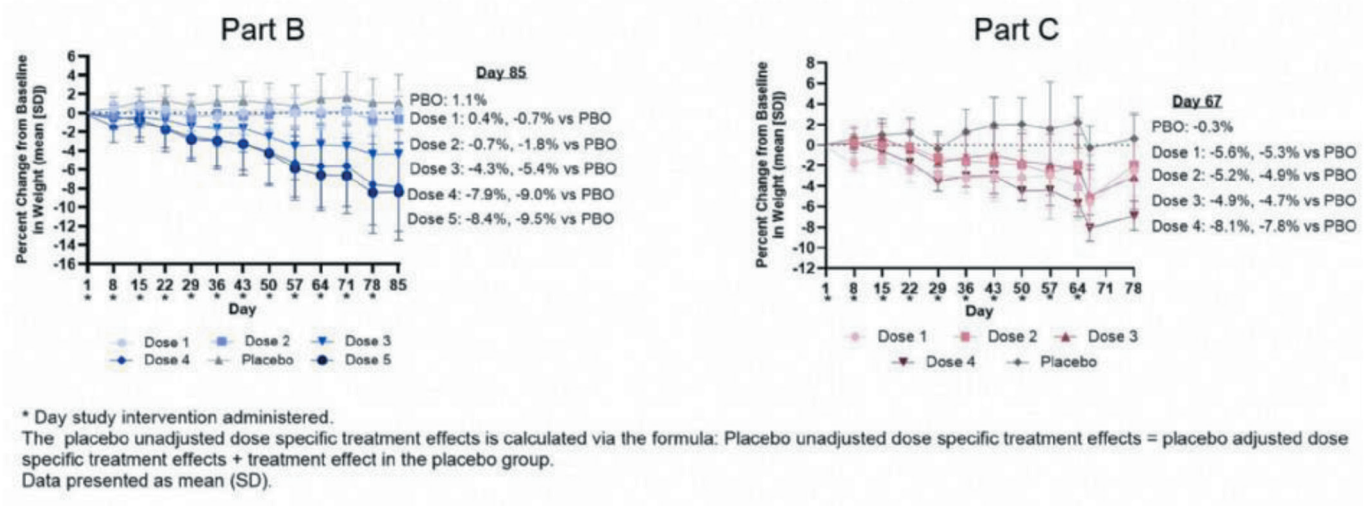


Fig. 1. Percent change in body weight.

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dose-proportional, reaching a maximum concentration in 2 days, and had a T1/2 of 3 to 4 days.
Conclusion: Colulintide caused dose-dependent weight loss and GI AEs, consistent with non-selective amylin and calcitonin receptor agonists. Colulintide was associated with psychiatric disorder domain AEs which led to discontinuation of dose escalation. It is unknown whether these findings are molecule-specific or could be related to the mechanism of action.

AD10.02

Real-world setmelanotide weight outcomes in French patients with acquired or congenital hypothalamic obesity

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Introduction: Hypothalamic obesity (HO) arises from physical damage due to trauma, tumours, treatment-related injuries, inflammation or due to developmental abnormalities affecting the hypothalamus, which can disrupt the melanocortin-4 receptor (MC4R) signalling pathway. This disease is marked by rapid and excessive weight gain following the damage. In a 16-week open-label trial, treatment of acquired HO with the MC4R agonist setmelanotide led to consistent and clinically significant responses, which were sustained or improved over a 12-month follow-up period. Here, we present real-world data for 24 patients with acquired or congenital HO in France who were treated with setmelanotide under pre-marketing early access authorization.
Methods: Patients with acquired or congenital HO were under early access treatment with setmelanotide in France. Weight-related outcomes for patients with at least 3 months of treatment data are reported.
Results: Twenty-four patients were included in this analysis, of which 11 children and 13 adults. Nineteen patients had acquired HO (craniopharyngioma (n=13), astrocytoma (n=2), AQP4 antibody encephalitis, ganglioma, neuroglial tumour or viral inflammation affecting the pituitary gland) and 5 patients congenital HO (septo-optic dysplasia (n=2), hamartoma, pituitary stalk interruption syndrome or Rathke's cleft cyst). Most patients started treatment at 0.5 or 1 mg/day, with one patient starting at 0.25 mg/day and one at 2 mg/day. Depending on the duration of treatment and adverse events, patients received 1 to 3 mg/day at last included visit. For paediatric patients, BMI z-scores decreased from a mean (SD) of 3.07 (0.75) to 2.82 (0.75) after 3 months of treatment. For patients with 6-month data (n=4), BMI z-score decreased from 3.37 (0.33) to 3.14 (0.40) and 3.06 (0.47) after 3 and 6 months, respectively. For the patient with 9-month data (n=1), BMI z-score decreased from 3.71 to 3.55, 3.40 and 3.28 after 3, 6 and 9 months. All paediatric patients had a lower BMI z-score after 3 months of treatment, with further mean decreases after 6 and 9 months. For adult patients, weight decreased from 136.6 (28.2) kg to 121.0 (28.2) kg after three months of treatment, indicating an 11.4% decrease in body weight. For patients with 6-month data (n=8), weight decreased 12.2% and 19.4% after 3 and 6 months, respectively. For patients with 9-month data (n=3), weight decreased 8.6%, 15.9% and 18.6% after 3, 6 and 9 months, respectively. All adult patients lost weight after 3 months of treatment, with further decreases after 6 and 9 months. No new safety signals were observed.
Conclusions: This real-world evidence of 24 patients with HO who received at least 3 months of setmelanotide under pre-marketing early access authorization in France showed improvements in weight outcomes, in all patients with acquired or congenital HO. Efficacy and safety outcomes are consistent with Phase 2 trial data demonstrating clinically beneficial outcomes of setmelanotide treatment in patients between 6 and 40 years of age with acquired HO.

AD10.03

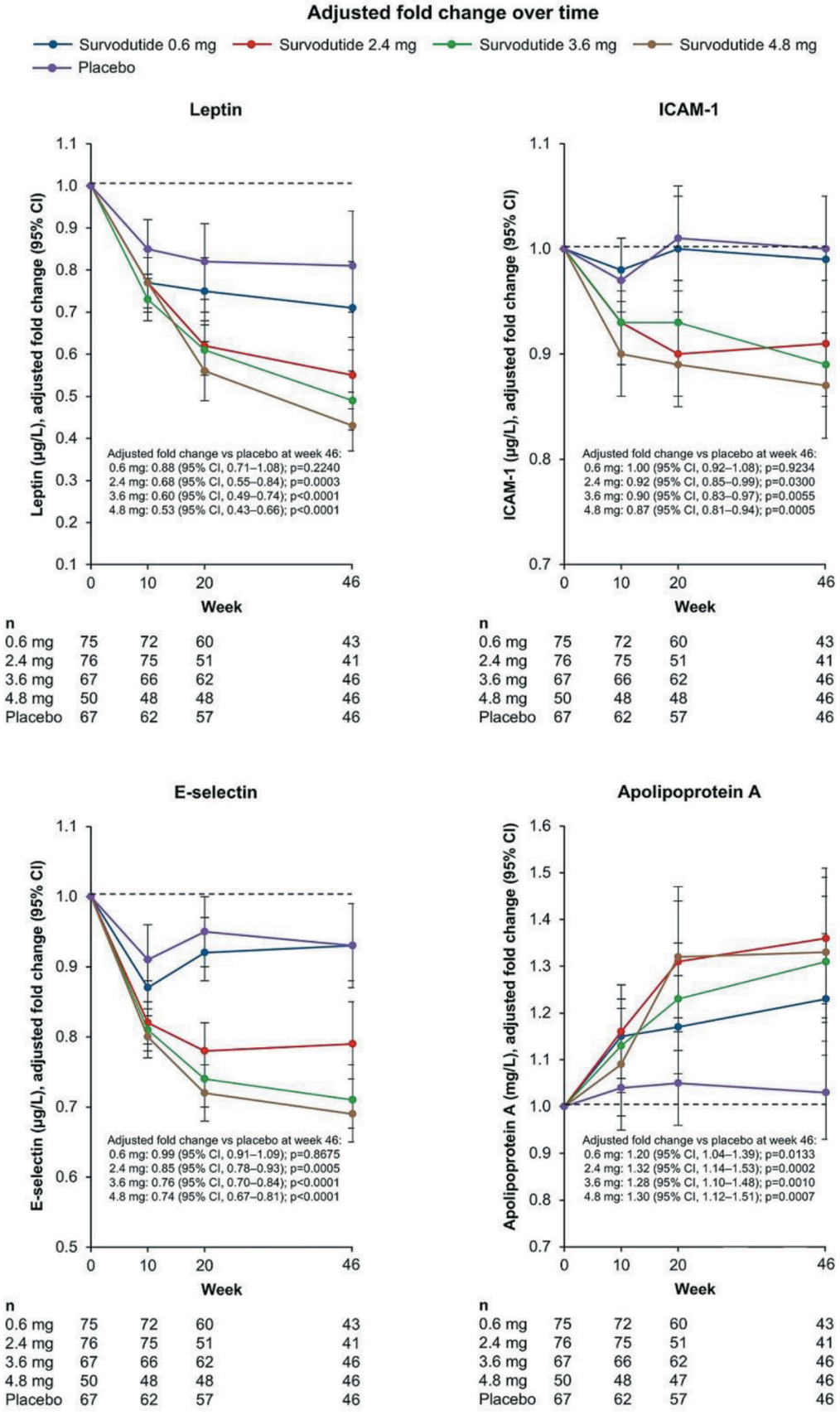
The dual glucagon/GLP-1 receptor agonist survodutide improved cardiovascular risk biomarkers in adults with obesity in a phase 2 trial

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Introduction: Survodutide is a unimolecular dual glucagon/glucagon-like peptide-1 receptor (GCGR/GLP-1R) agonist in phase 3 clinical trials for chronic weight management in people living with obesity and, separately, for treating people with metabolic dysfunction-associated steatohepatitis. Survodutide elicited up to 18.7% mean reduction in body weight after 46 weeks in a multinational phase 2 clinical trial in individuals with obesity without diabetes (NCT04667377). We explored changes in molecular markers of adiposity, inflammation, insulin resistance, coagulation, and atherosclerosis in this trial.
Methods: 387 people aged ≥18 to <75 years with body mass index (BMI) ≥27 kg/m² without diabetes were randomized to double-blind treatment for 46 weeks with once-weekly subcutaneous placebo or survodutide (doses escalated to 0.6, 2.4, 3.6 or 4.8 mg over up to 20 weeks with option to adjust dose for gastrointestinal tolerability, then maintained for the rest of the trial duration for each participant). In this pre-specified analysis, we evaluated plasma levels of multiple analytes, including leptin, intercellular adhesion molecule (ICAM)-1, E-selectin, apolipoprotein A, C-reactive protein (CRP), pigment epithelium-derived factor (PEDF), coagulation factor VII, and CC chemokine ligand 18 (CCL18) using a multiplex assay platform (Luminex xMAP). All participants receiving ≥1 dose of trial drug with data for ≥1 efficacy endpoint (the full analysis set [FAS]) were analyzed according to doses received during maintenance (actual treatment) using on-treatment data only and a mixed model for repeated measures.
Results: Baseline demographic and clinical characteristics were similar between treatment groups in the FAS (n=384). Overall mean age was 49.1 years and BMI 37.1 kg/m²; 262 participants (68.2%) were female, 301 (78.4%) white, 40 (10.4%) Asian and 37 (9.6%) black. Compared to placebo, survodutide treatment was associated with significant decreases in plasma levels of leptin, ICAM-1 and E-selectin (Figure), as well as CRP, PEDF, coagulation factor VII, and CCL18. At week 46, adjusted fold changes for 4.8 mg survodutide versus placebo were 0.53 (95% confidence

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On-treatment data by actual treatment for the full analysis set from mixed model for repeated measures with main effects for treatment, baseline and visit and interaction terms for treatment by visit and baseline by visit, and unstructured covariance matrix structure for repeated measurements within participants. CI: confidence interval; ICAM: intercellular adhesion molecule.

Fig. 1.

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interval [CI], 0.43–0.66; p<0.0001) for leptin, 0.87 (0.81–0.94; p=0.0005) for ICAM-1, 0.74 (0.67–0.81; p<0.0001) for E-selectin, 0.60 (0.42–0.86; p=0.005) for CRP, 0.87 (0.81–0.93; p=0.0001) for PEDF, 0.83 (0.75–0.91; p=0.0001) for coagulation factor VII, and 0.87 (0.81–0.94; p=0.0005) for CCL18. Conversely, apolipoprotein A levels were increased in participants receiving survodutide compared with those receiving placebo (Figure); the adjusted fold change at week 46 for 4.8 mg versus placebo was 1.30 (95% CI, 1.12–1.51; p=0.0007).

Conclusion: In this pre-specified exploratory analysis of a phase 2 trial, treatment with the dual GCGR/GLP-1R agonist survodutide was associated with improvements in molecular markers of cardiometabolic health and cardiovascular risk in people living with obesity.

AD10.04

Presentation of OBA: a phase 2 clinical trial testing the drug candidate BIO101 (20E) to limit the loss of muscle mass and function induced by semaglutide in patients with obesity

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Introduction: Up to 40% of the body weight loss induced by GLP-1 receptor agonist (GLP-1RAs) is due to reductions in lean body mass which includes skeletal muscle mass loss. Preservation of skeletal muscle mass and function loss in patients with obesity or overweight treated with GLP-1RAs could be achieved by adding skeletal muscle-targeted drug candidates such as the oral MAS receptor activator BIO101 (20-hydroxyecdysone; 20E),

Methods: In this context, BIO101 (20E) activity on muscle function has been tested on myoblasts and in high fat diet (HFD) obese mice and in a 12-week double-blind placebo-controlled study (6-week hypocaloric intervention phase followed by 6-week weight loss maintenance phase) with 37.5mg 20E in 58 participants with overweight or obesity (BMI ≥ 27 kg/m² and ≤ 38 kg/m²) aged 20-65 years.

Results: 20E has pro-differentiating effects in vitro in murine and human myocytes, increasing myotube diameter. In vivo, in HFD mice, 20E significantly prevented increase in adipose tissue by limiting adipocyte size, and decreased adipokines (leptin) and genes involved in inflammation (MCP-1), insulin resistance (osteopontin) and lipid storage (lipoprotein lipase).

20E at 37.5mg/day significantly decreased the secondary endpoint android fat mass in patients with overweight or obesity, (p=0.039). A nominally statistically significant reduction in adipocyte diameter was also observed in adipose tissue biopsies over the entire trial period. Moreover, compared to placebo, a trend for improvement in handgrip strength occurred in the subpopulation who lost more than 5% of their initial body weight during the hypocaloric phase.

Based on this observations and to answer the medical need represented by muscle mass and/or function loss induced in patients with obesity and treated with GLP-1RAs, Biophytis, has designed OBA, an interventional, randomized, double-blind, placebo-controlled clinical phase 2 trial in adults with obesity (BMI≥30) and overweight (BMI≥27) with one or more weight-related sequalae (e.g., hypertension, dyslipidemia, obstructive sleep apnea or cardiovascular disease) and treated with semaglutide. The primary endpoint is the knee extension strength. The main secondary endpoints include knee flexion and handgrip strength, physical performance, body composition parameters assessed through DXA examination, Quality of Life (SF-36 and WQOL-Lite-CT) and diet and exercise questionnaires. Subgroup analyses will be conducted on sub-populations determined by sex, BMI, age, and physical performance thresholds.

Conclusions: Supported by preliminary animal and clinical data, OBA a phase 2 Proof-of-Concept study combining BIO101 treatment with semaglutide received a may proceed letter from FDA and will be initiated shortly. While interactions are still ongoing with ethics committees, the protocol may be amended with the expansion to other countries in Europe and/or rest of the world.

AD10.05

The Effect of Early Weight Loss with Oral Shape-Shifting Superabsorbent Hydrogel Capsule

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Introduction: Early weight loss (EL) during treatment has been shown to be a strong predictor of longer-term weight loss. Early interventions for patients who are not responding well to treatment, such as add-on complementary therapies, treatment replacement, or treatment discontinuation, can help reduce exposure to ineffective therapies, improve the benefit-risk ratio for patients, and optimize healthcare resource utilization. In this post-hoc analysis, EL with Epitomee capsule combined with lifestyle intervention was examined.

Methods: The EL analysis is based on data from the RESET 24-week, double-blind, randomized, placebo-controlled study in participants with overweight and obesity. Participants (age=48.6±12.4; BMI=33.9±3.3) randomized to Epitomee (N=138) or placebo (N=141) combined with lifestyle intervention. The lifestyle portion included ongoing visit with a trained interventionist to support dietary and physical activity modification. Both the Epitomee capsule and the placebo were consumed twice daily at 30 minutes prior to two of the main meals.

Early weight loss was defined as ≥2% weight loss at week 8. Post-hoc analyses of early responders compared the two study arms' changes in body weight, shift in BMI classification, blood pressure (BP), and waist circumference from baseline to 24 weeks for each treatment arm.

Results: Among EL participants (n=77 and n=73 in the Epitomee and placebo groups respectively), weight loss at week 24 was greater with Epitomee compared to placebo (9.3±6.0% vs. 6.9±4.3%; p<0.0001). This was observed regardless of baseline BMI category (overweight, obesity class I and class II). The odds ratio for EL vs. none-EL to achieve >5% weight loss at week 24 was 5.00 (95%CI:1.20,20.89) for Epitomee and 2.51 (95%CI:0.64,9,76) for placebo. A greater proportion of EL receiving Epitomee, compared to placebo, achieved ≥7% (64% vs. 41%; p<0.001) and ≥10% (40% vs. 18%; p<0.001) weight loss at week 24. Additionally, participants in this EL sample demonstrated statistically significant reductions in waist circumference and BP from baseline to week 24 regardless of treatment condition.

Conclusion: Epitomee offers a new non-invasive, non-pharmacologic weight loss option for patients with overweight and obesity with BMI between 27-40 kg/m². EL with Epitomee was associated with greater weight loss (9.3%) at 24 weeks compared to placebo (6.9%). Monitoring early weight loss can facilitate identification of patients for whom the Epitomee capsule may be most beneficial.

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AD10.06

DAYBREAK Trial: Setmelanotide vs Placebo in Patients with Melanocortin-4 Receptor Pathway Variants

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Background: DAYBREAK (NCT04963231) is a 2-stage trial of setmelanotide in patients carrying a variant in ≥1 of 31 genes associated with the melanocortin-4 receptor (MC4R) pathway, which regulates energy balance and satiety.
Methods: Patients aged 6 to 65 years with body mass index (BMI) ≥40 kg/m2 (≥18 years) or ≥97th percentile (≥6 to <18 years) and hyperphagia carrying eligible variants were enrolled. Patients who achieved age-related weight loss criteria with setmelanotide at the end of the 16-week open-label Stage 1 (S1) could enter the 24-week, double-blind, randomized, placebo-controlled Stage 2 (S2). Patients could reinitiate open-label setmelanotide if BMI increased by ≥5% from S2 entry (switch to setmelanotide within S2 or transition early to bridging). Primary analyses were related to S1; S2 analyses, shown here, were exploratory or ad hoc.
Results: After S1, 49 patients with *PHIP*, *PLXNA(1-4)*, *SEMA3(A-G)*, *SIM1*, *MAGEL2*, *TBX3*, or *RPGRIP1L* variants were randomized 2:1 to receive setmelanotide or placebo; 39 completed S2. Three patients in the placebo arm switched to setmelanotide in S2, and 6 (n=4 placebo; n=2 setmelanotide) exited S2 early for bridging. A higher proportion of patients in the setmelanotide arm achieved or maintained 5% BMI reduction from study baseline to the end of S2 (27/32 on setmelanotide [84.4%] vs 5/17 on placebo [29.4%]; P=0.001). Per-genotype analyses were limited by the small number of placebo-treated patients. From study baseline to the end of S2, mean (SD; range) percent BMI change was −12.4% (8.0%; 1.2%-35.0%) in the continuous setmelanotide arm. Results of the gene cohort analyses were consistent with S1 trends; individuals with *PHIP* variants, which can lead to obesity by disrupting *POMC* transcription, maintained a consistent weight loss response. Setmelanotide was generally well tolerated with no new safety concerns.
Conclusion: The randomized setmelanotide withdrawal results support the efficacy of setmelanotide in patients with variants in the MC4R pathway genes and gene families identified in the open-label first stage of DAYBREAK and suggest these variants may be targets for setmelanotide therapy.

Tuesday, 13 May 2025

AD11 - Novel Drugs. The Seeds for the Future Are Here

AD11.01

HP515 supercharges lipid metabolism and energy expenditure, boosting GLP-1R agonist efficacy for weight loss and lean mass preservation

Li, J.; Yuan, H.; Du, W.; Chen, Y.; Li, X.
Hinova Pharmaceuticals Inc.

Introduction: Obesity rates continue to rise globally, particularly in Europe, the Americas, and Asia. Semaglutide and tirzepatide, two GLP-1R agonists, are effective in weight reduction by enhancing insulin sensitivity and promoting satiety. However, their use is limited by side effects like nausea, muscle loss, and weight regain after discontinuation. Thyroid hormone receptor beta (THRβ) agonists offer a novel approach for metabolic disorders, activating gene transcription in the liver and adipose tissue to promote lipid metabolism and energy balance. This study investigates the potential of HP515, a liver-directed, orally active, selective THRβ agonist, in combination with GLP-1R agonists to enhance weight loss while preserving lean mass.
Methods: We used a high-fat, high-fructose, and high-cholesterol diet-induced metabolic dysfunction-associated steatohepatitis (MASH) mouse model to assess HP515's effects on liver weight, lipid levels, and liver disease markers. Additionally, a high-fat, high-cholesterol diet-induced obese mouse model was used to evaluate the combination of HP515 with semaglutide and tirzepatide. The outcomes measured included body weight loss, fat mass reduction, lean mass-to-body weight ratio, and liver lipid levels. Gene expression changes in adipose and liver tissues were analyzed using RNA sequencing.
Results: HP515 significantly reduced liver weight, liver-to-body weight ratio, serum triglycerides (TG), total cholesterol (TC), LDL cholesterol (LDL-C), and hepatic lipid levels in the MASH model. It also improved the non-alcoholic fatty liver disease activity score (NAS) and reduced liver fibrosis. In the obese mouse model, semaglutide (30 nmol/kg) induced a 17.1% weight loss. However, when combined with 3 mg/kg or 30 mg/kg of HP515, weight loss increased to 30.2% and 35.4%, respectively. This combination also significantly improved fat mass loss and the lean mass-to-body weight ratio compared to semaglutide alone. The combination groups (65.2% and 68.8%) showed lean mass ratios close to the chow diet group (63.6%), while semaglutide alone resulted in 52.3%. Additionally,

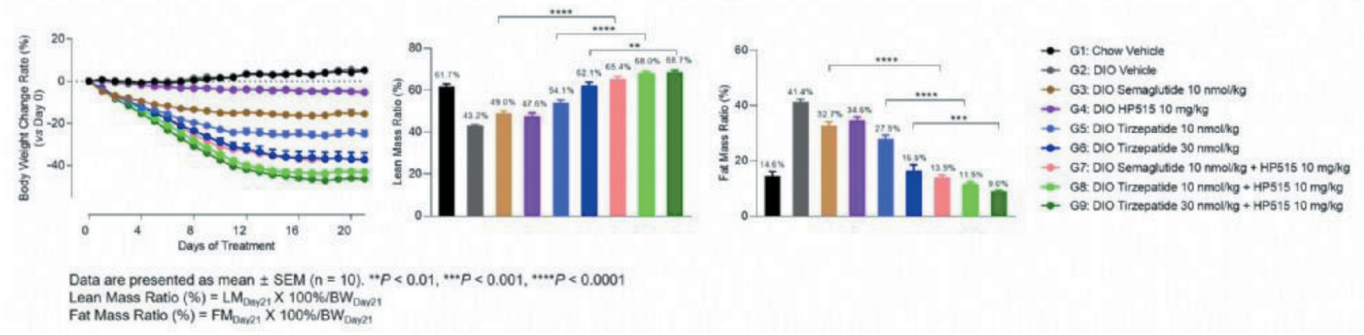


Fig. 1. HP515 enhances the weight loss efficacy of GLP-1R agonists while preserving lean mass.

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the combination reduced liver TG, TC, and plasma TC, TG, and LDL-C levels. RNA sequencing revealed upregulation of fatty acid metabolism genes (*CYP2E1* and UCP1) more pronounced in the combination group. Similar results were observed with tirzepatide.
Conclusion: HP515 shows promising potential as a combination therapy with GLP-1R agonists to promote weight loss while preserving lean mass. This approach could improve the efficacy of GLP-1R agonists, reduce required doses, and minimize adverse effects, offering a novel treatment for obesity and metabolic diseases.

AD11.02

siRNA-INHBE silencing in mice confirms human genetic data and supports the vision for next generation anti-obesity treatment

Yang, H. C.; Liu, W.; Bowman, K.; Byrne, M.; Caracta, C.; Desai, J.; Iwamoto, N.; Kandasamy, P.; Kawamoto, T.; Lamattina, A.; Liu, F.; Longo, K.; Luu, K.; Marappan, S.; Owen, L.; Pan, Q.; Prakasha, P.; Shah, H.; Singh, K.; Standley, S.; Taborn, K.; Thomas, C.; Yang, H.; Vargeese, C.; Ingelsson, E.

Wave Life Sciences, Cambridge MA, United States

Background: *INHBE* (Inhibin βE) is a gene encoding activin E, a hepatokine regulating lipolysis. Heterozygous carriers of *INHBE* loss-of-function variants (LoF) exhibit reduced abdominal fat, and reduced risk for type 2 diabetes and coronary artery disease, suggesting that lowering *INHBE* expression by 50% or more may restore a healthy metabolic profile in people living with obesity or metabolic syndrome. We investigated the impact of reducing *Inhbe* expression, via an *N*-acetylgalactosamine (GalNAc)-siRNA (INHBE-00003), on body weight and composition in a mouse model of diet-induced obesity (DIO), alone or added onto semaglutide treatment, a GLP-1 receptor agonist (GLP-1R).
Methods: C57BL/6 mice were fed a 60% high-fat diet to model DIO. Mice were treated with PBS or INHBE-00003 formulated in PBS, alone or added onto semaglutide treatment. Body weight, fat pad weight, and skeletal muscle weight were measured over time. *Inhbe* mRNA levels were also assessed.
Results: By 28 days after a single dose of INHBE-00003, DIO mice weighed 9% less, had 40% less diet-induced visceral adipose mass accumulation, and had 43% less diet-induced adipocyte enlargement than PBS-treated mice. At the same time point, quadricep muscle mass was preserved. In a separate study, daily semaglutide treatment in DIO mice resulted in mice weighing ~9% less than PBS-treated mice after 28 days. A single dose of INHBE-00003 added onto daily semaglutide treatment increased weight loss to 18% by day 28, compared with PBS controls. In another separate study, mice treated with daily semaglutide for 28 days regained all the weight they had lost by day 56. By contrast, mice treated with INHBE-00003 on days 21 and 28 maintained the semaglutide-induced weight loss compared with PBS-treated controls.
Conclusions: DIO mice treated with INHBE-00003 recapitulate human genetic findings for *INHBE* LoF, supporting the reduction of *INHBE* expression as means to support healthy weight loss. We also observed synergy between *INHBE* lowering with INBHE-00003 and daily semaglutide treatment. These preclinical results support multiple options for an *INHBE*-lowering siRNA treatment: 1) as a monotherapy, 2) an add-on to GLP-1R to potentiate weight loss, and 3) to curtail weight regain upon cessation of GLP-1R. Wave Life Sciences expects to initiate a clinical trial for WVE-007, an investigational INHBE GalNAc-siRNA, for the treatment of people living with obesity, in 1Q 2025.

Conflict of Interest: Authors are employees or contractors for Wave Life Sciences

Funding: This work was funded by Wave Life Sciences

AD11.03

The impact of steering fiber fermentation towards the distal colon on insulin sensitivity and cardiometabolic health in individuals with overweight: 12-week randomized controlled trial (DISTAL-study)

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Introduction: The gut microbiome ferments dietary fibers that reach the colon, producing short-chain fatty acids (SCFA) which are known to improve insulin resistance and cardiometabolic health. Previous work has shown that administering SCFA to the distal colon, not the proximal colon, has pronounced effects on cardiometabolic health. However, most dietary fibers are fermented proximally, leading to a lack of fermentable fibers and a shift towards protein fermentation in the distal colon, which reduces available SCFA and produces more branched-chain fatty acids (BCFA), known for their potential detrimental health effects. We hypothesize that increasing distal colonic saccharolytic fermentation while inhibiting proteolytic fermentation by using a fiber mixture that is fermented distally might therefore improve peripheral insulin sensitivity and cardiometabolic health in people at risk for developing type 2 diabetes.
Methods: This double-blind, 12-week randomized, placebo-controlled study investigated daily 15-gram potato fiber and sugar beet pectin supplementation or an isocaloric placebo (maltodextrin), added to a high-protein diet (25E% protein; 45% plant-based) on cardiometabolic health in adults with overweight at risk for developing type 2 diabetes. The primary outcome was peripheral insulin sensitivity (2-step hyperinsulinemic-euglycemic clamp). Secondary outcomes included tissue-specific insulin sensitivity, body composition, microbial composition (16SrRNA sequencing), and energy metabolism (indirect calorimetry), among other metabolic and lifestyle factors.
Results: 40 participants (30-75 years, BMI 28-40kg/m2) completed the intervention. We found no differences in peripheral, adipose tissue, or hepatic insulin sensitivity between groups. Interestingly, the rate of glucose disposal per unit insulin tended to decrease in the fiber group, while placebo tended to increase (ΔRd/insulin -0.006±0.019 vs 0.005±0.017, p=0.059). Protein oxidation increased by 19% in the placebo group, while the fiber group did not change (Δprotein oxidation 0.009±0.012 vs 0.000±0.000 g/min, p=0.026), without other differences in energy expenditure or substrate metabolism. Body composition and fecal and circulating metabolites including SCFA and BCFA were not altered over time, except for a significant difference in circulating isovalerate, which decreased in the fiber group and increased in the placebo group.
Conclusion: Potato fiber and sugar beet pectin supplementation against the background of a high (plant-based) protein diet did not improve insulin-mediated peripheral glucose disposal but rather tended to reduce glucose disposal per unit insulin. The lack of an increase in protein oxidation in the fiber group compared to placebo may suggest that fiber supplementation reduces the absorption and bioavailability of dietary proteins. More research on underlying mechanisms, including microbial composition and the balance between saccharolytic and proteolytic fermentation on both diets will follow.

Conflict of Interest: None disclosed

Funding: Research relating to this abstract was funded by NWO and Carbohydrate Competence Center (Next Food Collective).

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AD11.04

ABarginase: a First-in-class Drug Candidate for Treatment of Multiple Obesity-related Metabolic Diseases

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[2]ABRAM Therapeutics Limited, Hong Kong
[3]School of Biomedical Sciences, The Chinese University of Hong Kong, Hong Kong

Introduction: Obesity and its related metabolic diseases are global health threats with unmet medical needs. Animal studies show that depletion of essential amino acids such as leucine in the diet can reduce body fat mass and improve insulin sensitivity. However, long-term deprivation is harmful. Since leucine and arginine activate similar nutrient sensing pathways, we hypothesize that deprivation of arginine, a semi-essential amino acid, may have similar metabolic benefits but without much adverse effects.

Arginase is an arginine-depleting enzyme that converts arginine to ornithine and urea. Native arginase has a short circulatory half-life of less than 30 minutes. Using fusion protein strategy, we developed ABarginase, a recombinant human arginase that can bind to serum albumin to extend its circulatory half-life to over 4 days, which allows once-weekly injection to maintain arginine in the blood at low levels. This preclinical study investigated the efficacy and safety of ABarginase in treating obesity and its related metabolic diseases, including type II diabetes and fatty liver.

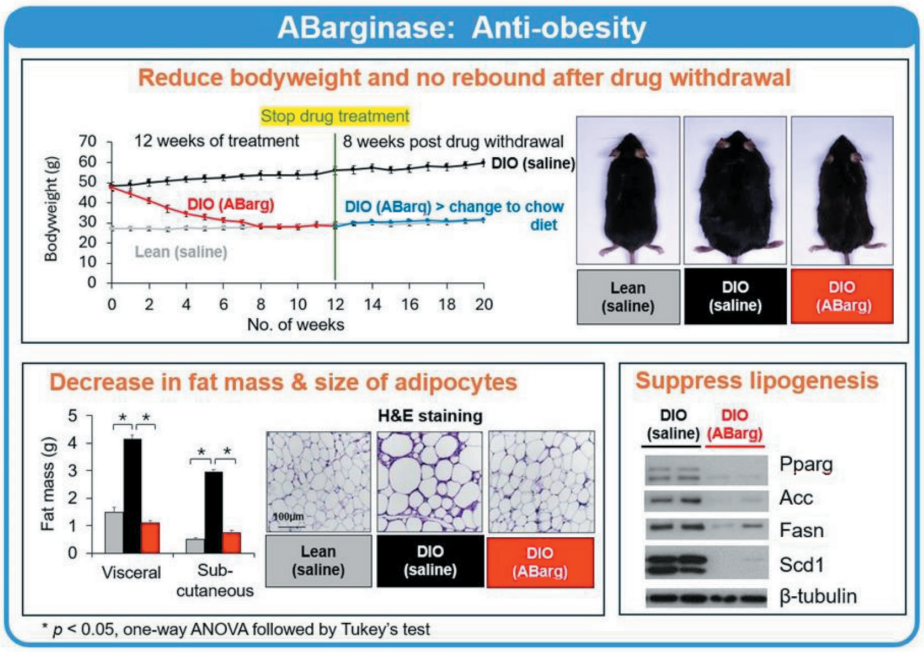


Fig. 1. Anti-obesity effects of ABarginase.

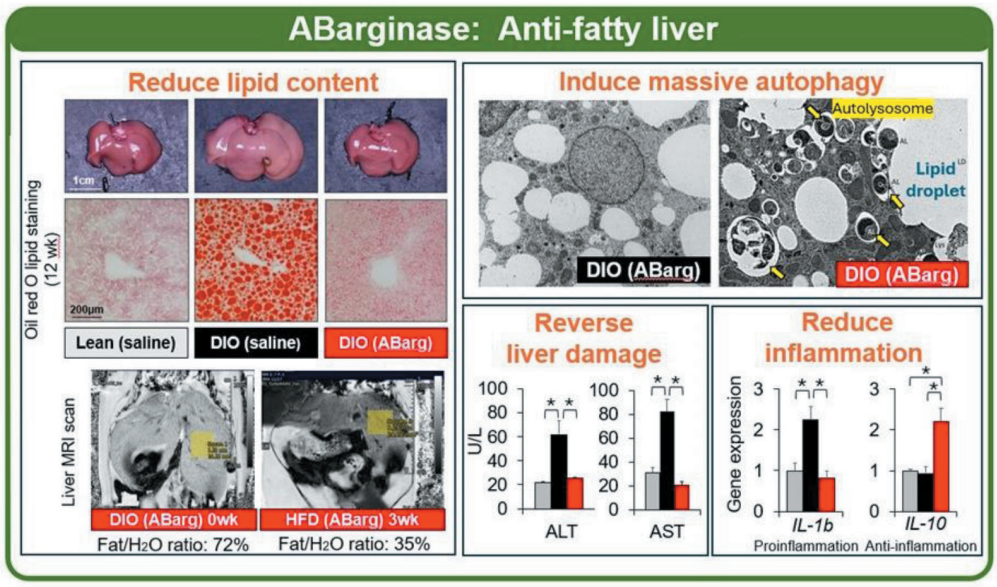


Fig. 2. Anti-fatty liver effects of ABarginase.

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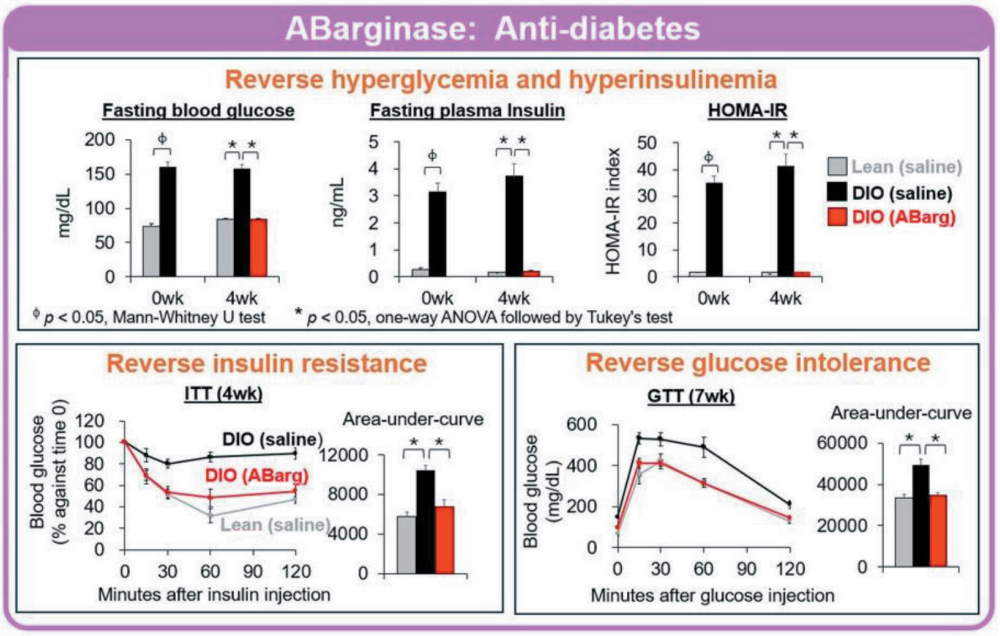


Fig. 3. Anti-diabetes effect of ABarginase.

Methods: Male mice were fed ad libitum with a high-fat diet to induce obesity. Diet-induced obese (DIO) mice were injected once-weekly with ABarginase or once-daily with semaglutide, DIO mice treated with saline served as the vehicle control, whereas age-matched mice fed an ordinary chow diet served as the lean control. Mice were treated for various durations (from 4 weeks to 8 months) and subjected to analysis of body composition, liver fat content, insulin sensitivity, muscle strength, whole-body energy expenditure, various metabolic and health markers and multi-omics studies.
Results: DIO mice treated with ABarginase achieved an average weight loss of 48% in comparison to 23% in mice treated with semaglutide, with body composition (fat mass and lean mass) and liver fat content being restored to levels similar to the lean control.
Results showed that ABarginase could suppress fat synthesis, promote fat breakdown, induce autophagy, increase insulin sensitivity and energy expenditure, and reduce oxidative stress and expressions of inflammation and fibrotic markers. Within 12 weeks of treatment, the bodyweight, fat mass, fatty liver and characteristic features of diabetes, such as elevated blood glucose, insulin resistance and glucose intolerance were entirely reversed. Following drug withdrawal after 12 weeks of treatment and switching to a chow diet, there was no rebound of bodyweight.
In DIO mice treated with ABarginase for 8 months, there was no drug resistance and ABarginase remained effective in maintaining various parameters (ALT, AST, blood pressure and heart rate) and muscle grip strength at levels similar to the lean control. Muscle stem cell markers and telomerase activity in muscle were significantly increased in comparison to the vehicle control.
Conclusion: ABarginase has potent anti-obesity and insulin-sensitizing effects. It has great potential to be developed into a first-in-class medication for weight loss and multiple metabolic diseases including metabolic dysfunction-associated steatohepatitis and type II diabetes.

AD11.05

ASC47, An Adipose-Targeted, Muscle-Preserving Weight Loss Drug Candidate For Obesity, Demonstrated Significant Weight Loss And Preserved Muscle In DIO Mice

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Introduction: ASC47 is a first-in-class, adipose-targeted, once-monthly subcutaneously injected, muscle-preserving weight loss drug candidate for the treatment of obesity. ASC47 is a potent and selective small molecule thyroid hormone receptor beta (THR-β) agonist discovered and developed in-house at Ascletis. The current study in diet-induced obese (DIO) mice assessed weight loss and muscle preservation of ASC47 monotherapy vs semaglutide.
Methods: Five-week-old male mice (C57BL/6J) were fed a high-fat diet (D12492 [Research Diets, Inc.]) with ad libitum fresh water and housed three to four mice per cage in a controlled environment (21-25 °C, 30%–70% relative humidity) with a 12-h dark/light cycle. After 16 weeks of feeding, the mice had obesity. Mice were grouped according to body weight and body fat percentage and muscle mass before the DIO studies. Animals were randomly divided into 5 groups (N=10 in each group) including C57BL/6 vehicle control (Lean mice); DIO model group; ASC47 (15 mg/kg, Q2W*6W, s.c); ASC47 (45 mg/kg, Q2W*6W, s.c); semaglutide (30 nmol/kg, QD*6W, s.c.). Body weight and food intake were recorded daily. Body composition was assessed by EchoMRI weekly. All operations and managements were carried out in strict accordance with the SOP institutional guidelines.
Results: In a head-to-head diet-induced obese (DIO) mouse study, compared to semaglutide (30 nmol/kg, QD, SQ), a clinically relevant dose of ASC47 (45 mg/kg, Q2W, SQ) reduced total fat mass (-63.5%, p=0.007 vs semaglutide), statistically and significantly more than semaglutide (-39.6%) in a DIO mouse study (Table 1). ASC47 increased total muscle mass (+5.8%, p<0.0001 vs semaglutide) compared to a decline in total muscle mass of semaglutide (-9.3%) (Table 1). Total body weight reduction was similar between ASC47 (-24.6%) and semaglutide (-23.1%) (Table 1), even though caloric intake reduction in ASC47-treated DIO mice was significantly less than semaglutide-treated DIO mice.
Conclusions: ASC47 has unique and differentiated properties, combined with ultra-long-acting subcutaneous administration, enabling targeted delivery to adipose tissue, resulting in significant weight loss and muscle preservation.

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Tab. 1. ASC47 reduced more fat and increased muscle in a dose-dependent manner compared to semaglutide in a head-to-head DIO mouse study.

Drug	Dosing	Total body weight change	Total fat mass change	Total muscle mass change
Lean	Vehicle, SQ, Q2W	10.7%	48.8%	1.48%
DIO	Vehicle, SQ, Q2W	10.4%	20.5%	6.37%
ASC47	15 mg/kg SQ, Q2W	-12.7%	-37.8%	+3.86% (p<0.0001 vs semaglutide)
ASC47	45 mg/kg SQ, Q2W	-24.2%	-63.5% (p<0.05 vs semaglutide)	+5.79% (p<0.0001 vs semaglutide)
Semaglutide	30 nmol/kg SQ, QD	-22.3%	-39.6%	-9.33%

Note: a. Q2W: once every two weeks; SQ: subcutaneous; QD: once daily.
b. The body weight on Day1 were set as the baseline. c. The fat and muscle mass measured by EchoMRI on Day0 were set as the baseline.

AD11.06

The novel small molecule Myo4 normalises glycemic control, reduces weight/fat mass and prevents semaglutide-induced muscle remodelling in the murine diet-induced obesity model

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[2]University of Exeter Medical School, UK

Background: GLP-1 receptor agonists (GLP-1RA) are proven therapeutic options reducing weight in obesity and related conditions (e.g. type 2 diabetes). However, concern is rapidly growing that this weight loss is at the expense of lean mass (skeletal muscle; SkM). For example, STEP1, STEP2, STEP4, and SUSTAIN8 trials with semaglutide showed lean mass accounted for up to 40% of weight loss; similarly seen in SCALE, LEAD-3 (liraglutide), SURMOUNT-1 (tirzepatide), and AWARD-11 (dulaglutide) trials. Though effective and well-tolerated, GLP-1RA have significant but poorly understood impact on SkM. Low muscle mass predicts poor health outcomes (e.g. frailty, disability, reduced immunity, increased infection risk, longer hospital stays, shorter lifespan). Thus, alternative

[A] Key parameter changes

Parameter	Vehicle	Semaglutide	Myo4	Combination (Semaglutide & Myo4)
Weight (absolute; g)	48.6 +/- 3.2	39.9 +/- 6.3	45.4 +/- 4.1	37.7 +/- 4.0
Weight relative (%)	101.0 +/- 3.4	81.1 +/- 6.2	93.2 +/- 4.7	76.8 +/- 3.7
Fat mass (% change from baseline)	-0.2 +/- 5.6	-34.06 +/- 13.1	-16.4 +/- 9.0	-44.5 +/- 10.0
Lean mass (% change from baseline)	-2.2 +/- 2.3	-0.8 +/- 3.2	1.7 +/- 3.7	1.4 +/- 4.5
Glucose (at 30 min)	17.9 +/- 3.1	16.2 +/- 1.5	17.6 +/- 2.7	14.5 +/- 1.7
Insulin (normalised to 0 min)	2.8 +/- 1.5	3.5 +/- 1.9	2.6 +/- 1.4	3.2 +/- 1.3

[B] Statistical analysis

Parameter	Vehicle vs. Semaglutide	Vehicle vs. Myo4	Semaglutide vs. Combination
Weight (slope)	p < 0.0001	p < 0.0001	p = 0.0052
Weight (mean)	p < 0.0001	p = 0.0001	p = 0.0303
Fat mass (mean)	p < 0.0001	p < 0.0001	p = 0.0093
Lean mass (mean)	p = 0.1907	p = 0.0034	p = 0.0689
Body composition (fat:lean)	p < 0.0001	p < 0.0001	p = 0.0086
Glucose (mean at 30 min),	p = 0.0799	p = 0.7059	p = 0.0978
Insulin (normalised to 0 min)	p = 0.3945	p = 0.5931	p = 0.9422

Effect of Myo4 (2.2 mg/kg), semaglutide (10 nmol/kg) or both drugs on key parameters in 16-week high fat diet-fed mice after 28 days dosing. [A] mean ± s.d., (n = 8-12 per group). [B] Statistical analysis (Exploristics Ltd, Belfast): Dunnett's with one or two-factor linear models with interactions with weight as the outcome, including baseline weight, treatment, time and a treatment*time interaction as fixed effects, and a random effect for intercept and slope.

Fig. 1.

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muscle-sparing weight loss strategies are urgently needed. Since mitochondrial dysfunction is a critical obesogenic and atrophic driver in metabolic diseases, we therefore developed novel small molecule mitochondriotropics to address these skeleto-metabolic defects.
Methods: We optimised structural and physicochemical properties, phenotypically screening compounds in mitochondrial and mammalian myotube functional assays, and other systems. Mitochondria-specific accumulation was confirmed using super-resolution microscopy with LC-MS/MS and in vivo toxicology identified Myo4 as the lead compound. Efficacy was tested in male C57BL/6JRj mice with diet-induced obesity (DIO), fed high fat diet (60%-kcal; D12492) or standard chow (Altromin 13240) from 5 weeks for 16 weeks, then dosed (s.c., q.d., T.I.W.) with Myo4 (0.22-2.2 mg/kg), semaglutide (10 nmol/kg), or both drugs for 4 weeks (n = 8-12 per group). Body weight, food intake, fasting glucose, insulin, OGTT, eWAT, BAT, SkM weight, and fat:lean redistribution (MRI) were assessed. Results were analysed with Dunnett's test, one/two-factor linear models with interactions.
Results: Myo4 rapidly accumulated within the mitochondrial matrix confirming mitochondria-targeting (i.e. 90 % with 60 min) with clean in vitro and in vivo toxicological assessments and EC50 < 20nM across screening assays. In vivo, ADME/PK studies (0.1-5 mg/kg, i.p., q.d.) showed SkM accumulation of Myo4 (e.g. gastrocnemius) within 1 h alongside detection of metabolites of Myo4 confirming in vivo SkM utilisation. In DIO mice, semaglutide caused an expected significant decrease in initial food intake (0-11 days) but this effect was absent with Myo4 at all doses. Key outcomes in DIO mice are summarised in Figure 1: Semaglutide and Myo4 alone reduced weight and fat mass, and glucose (OGTT) but increases in lean mass were only observed with Myo4 treatment. Of particular importance, Myo4 potentiated the beneficial metabolic effects of semaglutide, and crucially, significantly improved body composition (fat:lean ratio; Figure 1).
Conclusions: Myo4 is a novel first-in-class anti-obesogenic and muscle preserving therapeutic which could be used as a monotherapy for obesit0y-related indications requiring weight loss with muscle protection, or as a monotherapy following GLP-1RA cessation, and could be used in combination with GLP-1RA to prevent loss of SkM mass and function.

AD12 - From Bytes to Adipocytes: Digital Health's Role in Obesity Management

AD12.01

Association between StuffThatWorks Remote Platform and GLP1 Drug Management Efficiency

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[3]Faculty of Medicine Reichman University, Israel

Introduction: The healthcare industry is facing unprecedented challenges in managing the surge of GLP1 drug users for weight loss and associated metabolic conditions. Long-term patient retention and comprehensive data collection remain critical yet unresolved issues. Traditional methods have shown limited success in maintaining patient adherence and collecting reliable longitudinal data. StuffThatWorks, developed by members of the Waze founding team, introduces a novel, AI-powered platform that integrates remote patient management and advanced data collection techniques to address these challenges.
Methods: The StuffThatWorks platform utilizes a multi-dimensional approach to remote patient management. Core components include real-time data collection via patient-reported outcomes, integration with electronic medical records (EMRs), and wearable devices for objective health metrics. The platform incorporates automated triage, personalized education modules, and drug titration scheduling. Data normalization algorithms standardize patient-reported updates on parameters such as weight, well-being, dosage changes, and side effects, while a community-centric framework enhances patient engagement and retention.
Results: Over a one-year period, the platform demonstrated a patient retention rate exceeding 73%, significantly surpassing industry benchmarks. Retained patients provided updates, on average, twice weekly, offering insights into weight loss, well-being, treatment adjustments, and side effects. These outcomes can be bolstered by the seamless integration of EMR data, wearable device metrics, and automated side effect monitoring. The community-driven model facilitated sustained engagement, high satisfaction rates, and a scalable solution for long-term patient management.
Conclusion: The StuffThatWorks platform represents a paradigm shift in remote GLP1 drug management, combining scalable technology with community engagement to achieve exceptional patient retention and data quality. Its robust framework integrates subjective and objective data streams, enabling healthcare providers to optimize patient outcomes effectively. This innovative approach highlights the potential for AI-driven platforms to address critical gaps in chronic disease management and pharmacological treatment adherence.

AD12.02

Treat to Target in Weight management with Semaglutide: Real-World Evidence from an eHealth Clinic (TRIM)

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[2]Department of Biomedical Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark
[3]Department of Public Health, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark

Introduction: Incretin-based treatments have shown impressive weight loss in randomized controlled trials (RCTs). However, real-world evidence (RWE) on their effectiveness with lifestyle interventions, particularly in digital health settings, is limited. Prior RWE studies report smaller weight loss than RCTs, often without details on lifestyle interventions or medication use patterns. RWE suggests that few patients follow the dose titration used in clinical trials and most stay on lower doses than the standard 2.4 mg once-weekly. Key questions remain on scalable implementation and optimal medication dosing to reduce side effects and enhance long-term outcomes. This study evaluated the real-world effects of an online weight-management clinic (Embla), consisting of coaching that involves evidence-based recommendations on nutrition, exercise and behavioral therapy in combination with personalized semaglutide dosing.
Methods: This study is a real-world, new-user cohort including adults signing up for the weight management program no later than the 30th of September 2024. The program combined psychosocial learning principles, including Cognitive Behavioral Therapy (CBT) and Acceptance and Commitment Therapy (ACT), with diet, exercise and personalized medicine strategies. The intervention was delivered by a team of coaches, nurses, psychologists and physicians through an AI-powered app in order to tailor the program to each unique individual. The tailored dose escalation regimens focused on limiting side effects, limiting costs and involving shared decision making. All participant contact, data collection and monitoring was conducted via the Embla app and online calls. The primary outcome measure was percentage change in body weight from enrolment to week 64. Secondary outcomes measures included the average weekly dose of semaglutide (mg/week). Outcomes were modelled using a linear mixed effects model using data from weeks 1 to 64.
Results: A total of 2.694 participants were enrolled in the programme. After 26, 52, and 64 weeks, respectively, 1.580, 712, and 465 were still included. The programme resulted in an average weight loss of -16.7% (95%CI, -17.4 to -16.0) after 64 weeks (figure 1A), with a mean semaglutide dose of 1.02 mg/week (SD 0.56) (figure 1B). 98% and 83% of participants achieved weight loss of at least 5% and 10%. The percentage change in body weight was similar across baseline BMI class subgroups (figure 1C) and across average medication doses (figure 1D).
Conclusion: Participants in the Embla online obesity clinic achieved weight loss of a magnitude similar to those reported in randomized

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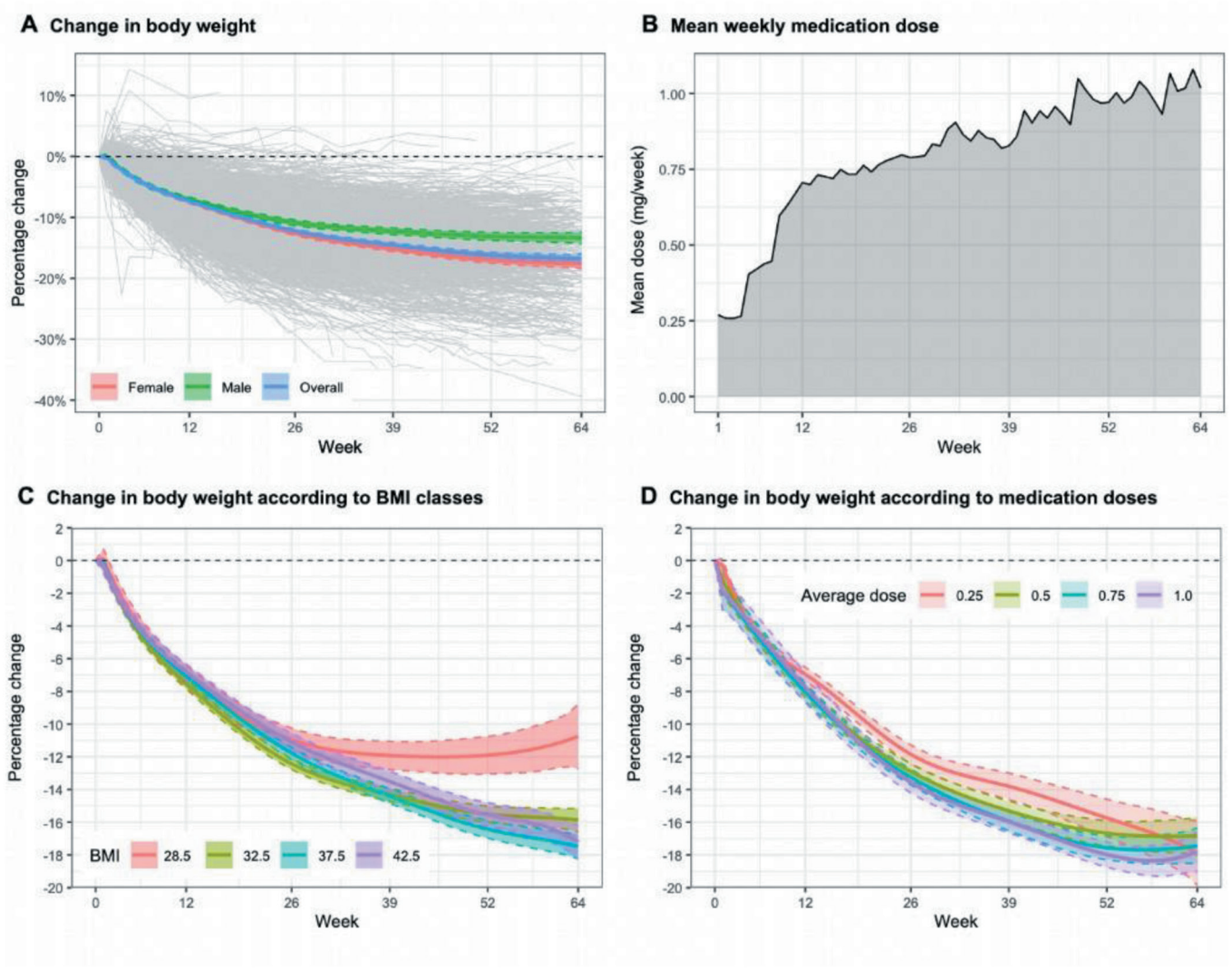


Figure 1. Changes in percentage body weight from initiation of the programme up to 64 weeks. Grey lines showing individual weight loss (Panel A). Mean weekly doses of semaglutide use (mg/week) from week 1 to week 64 (Panel B). Change in percentage body weight according to BMI classes (Panel C) and change in body weight according to medication doses 0.25, 0.5, 0.75, and 1 mg/week (Panel D).

Fig. 1.

controlled trials but with less than half of the medication used. Similar mean weight loss was observed across BMI classes and all medication doses. These results highlight the effectiveness of a personalized, treat-to-target approach to medical obesity management when combining this with intensive behavioural therapy. Furthermore this approach demonstrated that lower doses of semaglutide can still yield strong outcomes on weight loss offering new insights into the role of personalized dosing strategies and implementation.

AD12.03

Efficacy of digital programmes in adult weight management. A systematic review and meta-analysis

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Introduction: An increasing number of digital programmes are available to support people living with obesity. These programmes may be important in increasing the accessibility to appropriate support, enabling more people to achieve and maintain weight loss. This review aims to investigate the short-term and long-term efficacy of digital programmes compared to face-to-face contact or other forms of standard care.

Methods: A systematic search was conducted using four databases (Web of Science, CINAHL, Scopus and Medline). The PICO framework was used to determine inclusion criteria: Population – non pregnant adults with/without co-morbidities aged ≥18 years living with overweight/obesity; Intervention – digital technology eg web-sites, emails, SMS texting, apps; Comparison – non-digital, standard care or wait-list; Outcomes (primary) – changes in body composition including weight, BMI, waist circumference and body fat percentage. Where data was available, outcomes were compared at 3±1, 6±1 and 12±1 months with meta-analyses undertaken. Secondary outcomes included dietary and physical activity changes. To quality assess and determine any risk of bias, the Cochrane Risk of Bias 2 tool was used.

Results: Eleven studies, nine randomised controlled, one retrospective cohort and one quasi-experimental study met inclusion criteria. Studies included both male and females (two studies, male only). Overall, the studies were of low-medium risk of bias. Eight studies were included in the quantitative analyses for the primary outcomes. At 3±1 months for digital versus face-to-face/standard support, all body composition

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outcomes non-significantly favoured the face-to-face group (BMI CI -1.16 to 3.38kg/m2, p-value = 0.34). Across subsequent time-points, negative mean differences favoured the digital support group for all outcomes but did not reach statistical significance. For BMI change, this ranged from -0.23 to -0.89kg/m2, for weight change from -0.27 to -1.2kg and for body fat percentage the overall mean difference was -4.21% in favour of digital support.
Energy intake was reported across four studies with mixed findings at 3±1 months. At 6±1 months, a -115.6kcal/day greater reduction in energy intake was achieved in the digital group. Three studies reported changes in physical activity where the results all significantly favoured the digital group.
There are limitations to our review. Heterogeneity of the studies was high, ranging from 66-99% which may be due to differences in the study characteristics. The majority of results are not statistically significant and therefore should be interpreted with caution. Many studies also experienced high attrition rates, which increases the overall bias. Compliance should be considered as an important outcome measure in future reviews.
Conclusion: In the short-term, face-to-face or standard care may be better than digital support but but over time, digital support becomes more effective. Digital weight management support should be considered as a scalable and accessible option which is likely to be equally as effective as standard care. We noted that a level of personalisation increased the efficacy of digital support.

AD12.04

Sustainable Weight Loss and Health Benefits in Obesity Care: 18-Month Real-World Results in a Virtual Care Setting

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Introduction: Obesity is a chronic disease requiring comprehensive, lifelong management. Digital care for obesity offers numerous benefits for patients and providers, including improved accessibility, convenience, and the potential for better treatment outcomes through continuous support and holistic care.

Methods: This retrospective real-world study evaluated outcomes from 2,008 patients, assessing changes in weight, fat mass, waist circumference, blood pressure, and laboratory markers. All patients were treated for 18 months through Yazen Health's digital care service. Of these, 455 were men and 1,553 were women. For inclusion, patients had a BMI of at least 30 kg/m² or ≥ 27 kg/m² with weight-related health problems. The mean initial BMI was 33.5 (SD 4.9), and the mean age was 48.9 years (SD 10.4). Patients recorded weight and other metrics and received continuous support through the Yazen app. The care model integrates a multidisciplinary team,comprising physicians, health coaches, dietitians, psychologists, and personal trainers. Most patients were treated with different GLP-1 analogues and received lifestyle interventions through the app. Medication doses were gradually increased to minimize side effects. Baseline laboratory tests were taken, followed by additional tests at 6 and 15 months. Weight and anthropometric variables were measured monthly.
Results: The cohort achieved significant weight loss, with mean reductions of 8.3% after 3 months, 12.9% after 6 months, 15.5% after 9 months, 16.4% after 12 months, 16.7% after 15 months, and 16.6% after 18 months. Weight, waist circumference, and fat mass decreased continuously up to 12 months, after which a plateau was observed with no further significant changes between 12 and 18 months. Women demonstrated greater weight reduction compared to men (17.6% vs. 13.4% after 18 months, $p < 0.001$). Significant improvements in blood pressure, blood lipids, liver enzymes, glucose, and HbA1c levels were observed, progressing gradually from baseline and reaching substantial levels by 12 months, reflecting enhanced metabolic health
Conclusion-Discussion: This 18-month retrospective study demonstrates the effectiveness of a digital, team-based, holistic care approach for sustainable weight loss and health improvements in patients with obesity. In the STEP 1 and STEP 5 studies conducted by Novo Nordisk, participants with obesity were treated with semaglutide, with doses gradually increased to 2.4 mg. The STEP 1 trial reported an average weight reduction of approximately 14.9% after 68 weeks (about 16 months) of treatment, and the STEP 5 trial demonstrated a mean weight loss of over 15% from baseline through 104 weeks (2 years). While direct comparisons should be interpreted cautiously due to differences in study designs, populations, and treatment modalities, the outcomes observed in Yazen Health's digital care model—which integrates lifestyle interventions with individualized pharmacological treatment—suggest a comparable or potentially favorable effectiveness when considering real-world settings.

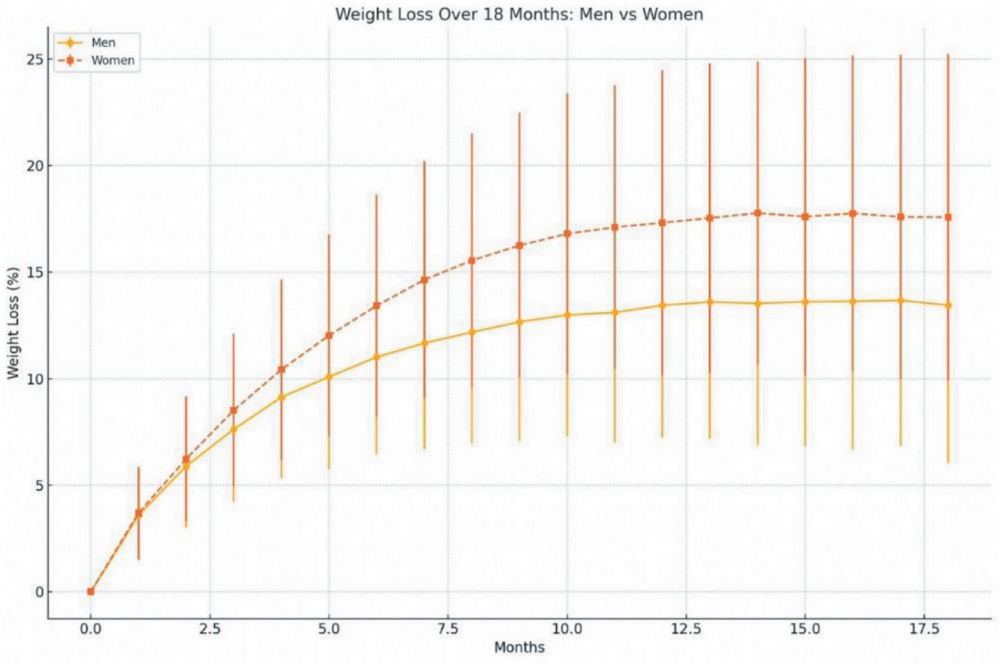


Fig. 1. Weight Loss Over 18 months: Men vs Women.

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AD12.05

Novel service design of an integrated NHS and digital pathway - Using Roczen to increase capacity and access for people with obesity eligible for publicly-funded specialist weight management services

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Introduction: The increasing impact of obesity in the UK necessitates innovative solutions to improve patient access to approved clinically effective treatments and streamline care pathways. Average waiting list time for National Health Service (NHS) specialist weight management services (SWMS) are estimated at 16 months, with patients waiting 12 months to enter bariatric services, on average. The integration of patient preferences, including flexibility in delivery (digital or face-to-face), is crucial to improving accessibility and retention. In 2023, the National Institute of Health and Care Excellence (NICE) recommended Roczen in guidance to deliver digital weight management inclusive of pharmacotherapy and monitoring in the NHS. East Suffolk and North Essex Foundation Trust (ESNEFT) and Roczen have launched a novel partnership to deliver a publicly funded and integrated specialist weight management service (SWMS).

Objectives: This partnership aims to:

1. Improve patient choice and flexibility in accessing SWMS by integrating digital pathways, improving retention and adherence.
2. Streamline the assessment process with a focused 3-6 month multidisciplinary evaluation for treatment suitability, reducing waiting times for eligible patients seeking pharmacotherapy or bariatric surgery
3. Optimise resource utilisation within NHS services whilst maintaining clinical governance, delivering cost-effective and scalable interventions

Methods: The service comprises a multidisciplinary team of both the NHS and Roczen clinicians, including GPs, bariatric surgeons, dietitians, bariatric physicians and psychologists utilising partnership working. This includes regular interdisciplinary working, shared protocols and joint training. Patients engage in an initial 3-6 month programme (either face-to-face or digital depending on patient preference) designed to deliver an evidence-based dietary and behavioural intervention whilst assessing eligibility for pharmacological or surgical treatment. Biometric and psychosocial data are collected using digital tools, including the Roczen App, at baseline and throughout the intervention for patient safety, pharmacovigilance and service improvement.

Implementation: The service was introduced in ESNEFT in December 2024 following alignment of clinical workflows with the digital programme components at kick-off workshops according to the NHS service specification. Clear referral criteria and governance processes were defined. These collaborative workshops addressed clinician's potential concerns regarding digital pathways, improving understanding across the teams. Early service data will be available in May 2025. This will include data on access, retention and referral into the digital pathway, as well as patient biometric and psychosocial outcomes.

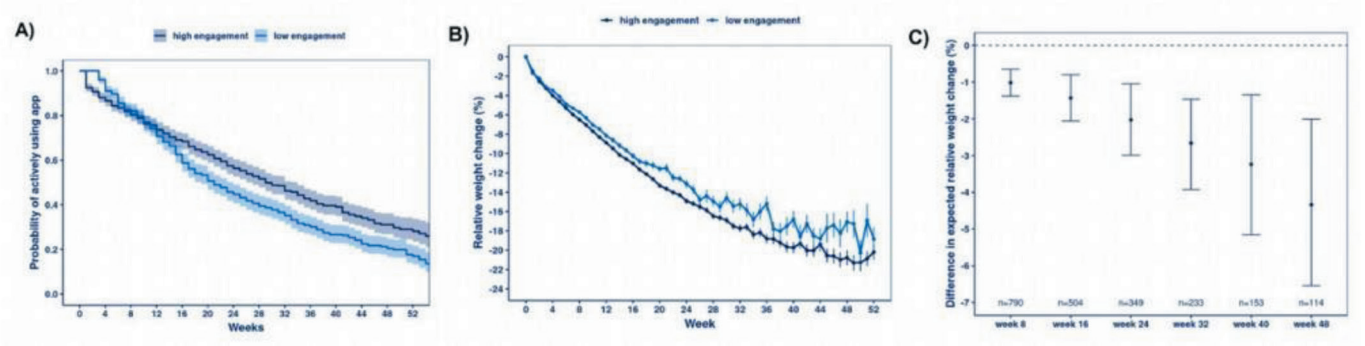
AD12.06

Association between engagement with the WegovyCare digital self-support app and weight loss in a real-world setting

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Introduction: WegovyCare is an app-based patient support solution (PSS) for individuals with obesity (body mass index [BMI] ≥ 30 kg/m2) or overweight (BMI ≥ 27 kg/m2 to <30 kg/m2) with at least one weight-related comorbidity (e.g., dysglycaemia, hypertension, dyslipidaemia, obstructive sleep apnoea or cardiovascular disease) using once-weekly subcutaneous semaglutide (dose range: 0.25 mg to 2.4 mg) for weight management. The app allows users to track body weight, record their semaglutide doses, and access educational resources designed to assist with weight management.



A. Kaplan-Meier curve showing the probability of continued app use over time for users with high engagement (dark blue; activity ratio >0.5) and low engagement (light blue; activity ratio ≤0.5).
B. Line graph showing relative weight change (%-points) over 52 weeks for users with high engagement (dark blue; activity ratio >0.5) and low engagement (light blue; activity ratio ≤0.5). Points and error bars show the mean and standard error of the mean.
C. Plot of median (symbols) and 95% credibility interval (bars); the plot shows the difference in predicted relative weight change (%-points) at weeks 8, 16, 24, 32, 40, and 48, comparing app users with higher engagement (activity ratio 0.75) to those with lower engagement (activity ratio 0.25). The horizontal dashed line at 0 represents no difference in predicted relative weight change between the two groups. The mean baseline body weight was approximately 105 kg, meaning a 2.0 %-point reduction roughly corresponds to a 2 kg weight difference.

Activity ratio definitions were adapted from Böhm AK et al., *JMIR Mhealth Uhealth* 2020;8(11): doi: 10.2196/22212.

Fig. 1. App stay time by app engagement (A), weight loss trends by app engagement (B) and difference in predicted relative weight change at various time points (C).

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This real-world, retrospective study evaluated the association between app engagement and weight loss among app users.
Methods: Data were collected from all countries where the app was launched – Denmark (from January 2023), Germany (from July 2023), and Switzerland (from November 2023) – until May 2024. App engagement was categorised based on the activity ratio, defined as the proportion of weeks with at least one app entry where both body weight and dose were recorded. App users were classified into two groups: high engagement (activity ratio >0.5, users checked-in during more than half of their app use weeks) or low engagement (activity ratio ≤0.5; users checked-in during fewer than half of their app use weeks). Kaplan-Meier analysis was used to assess app use duration (stay time). Here, users were considered inactive if they had no check-ins for 12 consecutive weeks. A Bayesian linear regression model was applied to predict weight loss differences by app engagement, adjusted for sex, age, and baseline body weight (recorded at the user's first check-in).
Results: Of the 4108 registered app users, 1797 (81% female; mean age 48 years; mean baseline body weight of 105 kg) had at least one check-in after baseline, and the majority (>85%) were from Denmark, reflective of the app launch date. In total, 964 registered app users were classified into the high app engagement and 833 into the low app engagement group. App users with high engagement had longer periods of app use than those with low engagement (Fig. 1A). A steady reduction from baseline in body weight was observed among those who remained engaged over 52 weeks. High app engagement was associated with greater body weight reductions than low app engagement (Fig. 1B). At 24 weeks, compared with app users with lower app engagement (activity ratio 0.25; predicted relative weight change: -12.6% [95% credibility interval [CI]: -13.3; -11.8]), app users with higher app engagement (activity ratio 0.75; predicted relative weight change: -14.6% [95% CI: -15.2; -13.9]) were predicted to have a 2.0 %-point (95% CI: 1.1; 3.0) greater reduction in body weight (Fig. 1C).
Conclusions: High app engagement with WegovyCare was associated with greater weight loss than low app engagement, suggesting that the use of a digital app could additionally support weight management, although not necessarily reflecting a causal relationship.

AD13 - Public Health Epidemiology

AD13.01

Obesity Prevalence by Education, Occupation, and Income from 2005 to 2019: trends from the Portuguese National Health Surveys

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Introduction: In Portugal, obesity inequalities related to education are well documented, with women disproportionately affected. However, other dimensions of socioeconomic position (SEP), such as occupation and income, are often overlooked. This study analysed trends in obesity prevalence among women and men from 2005 to 2019, stratified by education, occupation, and income, using data from the Portuguese National Health Surveys (NHS).
Methods: Weighted data from adults aged 20–64 years in the 2005/2006 (N=6,508,833), 2014 (N=6,227,041), and 2019 (N=6,073,178) NHS were analysed. SEP indicators were education (none, 6th grade, 9th grade, 12th grade, post-secondary education, higher education), occupation (unemployed, operations/trade, technical/administrative, senior professional and managerial), and monthly household income (quintiles). Obesity was defined as Body Mass Index ≥ 30 kg/m², calculated from self-reported data. Prevalence estimates with 95% confidence intervals (CI) were calculated for each survey, and stratified by sex and socioeconomic indicators. Analyses were conducted in RStudio®.
Results: Overall prevalence of obesity increased modestly between 2005/2006 and 2019, reaching approximately 17% for both sexes by 2019: 16.93% (95%CI=15.25–18.61) in women and 16.53% (95%CI=14.64–18.41) in men. During this period, obesity prevalence rose among individuals with lower educational attainment: an increase from 30.47% (95%CI=25.50–35.45) to 42.34% (95%CI=25.93–58.74) in women with no formal education, while men's rates rose from 21.34% (95%CI=13.55–29.12) to 25.21% (95%CI=11.32–39.10). Conversely, higher education was associated with consistently lower and more stable obesity rates across time. Unemployment was linked to increasing obesity rates, particularly among men, whose prevalence rose from 6.16% (95%CI=2.07–10.25) to 16.43% (95%CI=12.64–20.22). In contrast, men working in senior professional and managerial occupations experienced declining obesity prevalence from 14.32% (95%CI=11.42–17.23) to 10.78% (95%CI=7.43–22.27). Low-income quintiles consistently showed the highest obesity prevalence, peaking in 2014 among women at 24.80%; 95%CI=21.33–28.28) before declining to 18.27% (95%CI=14.92–21.62) in 2019. Men in the lowest income quintile exhibited stable prevalence (~17%). Obesity rates were lower and relatively stable in the highest income quintile for both sexes.
Conclusion: There are clear sex differences in obesity distribution by socioeconomic position in Portugal. An inverse relationship between educational level and obesity prevalence was evident, with a stronger magnitude observed in women compared to men. Larger differences were also found in obesity prevalence by occupation and income in women than in men. Stronger efforts, including targeting structural determinants of health, are needed to achieve meaningful reductions in obesity prevalence and to address the persistent sex and socioeconomic inequalities associated with obesity.

AD13.02

Genetically Predicted and Measured Obesity in Relation to Adiposity and Risk of Mortality and Non-Communicable Diseases

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Introduction: Obesity is a strong risk factor for mortality and several non-communicable diseases (NCDs), including stroke, cancer, and chronic obstructive pulmonary disease (COPD). However, the interplay between genetic predisposition and measured obesity in relation to health risks is not fully understood. In our previous research, we have seen that obesity in midlife was a stronger risk factor among those with genetically predicted low BMI compared to those with genetic predisposition to a higher BMI1. This study investigates the independent and joint effects of Body Mass Index (BMI) and genetic predisposition on mortality and NCD risks using UK Biobank data.
Methods: We analyzed data from 488,000 UK Biobank participants aged 40–69 years. We categorized BMI using WHO criteria (underweight, normal weight, overweight, obesity) and computed polygenic scores for BMI (PGSBMI) to measure genetic predisposition.

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Using register linkage, we examined outcomes, including incident all-cause mortality, stroke, cancer, and COPD. We applied Cox proportional hazards models to assess the independent and joint effects of BMI and PGSBMI, along with their interaction, while adjusting for age, sex, and education.

Results: Obesity and the PGSBMI were associated with higher risk of all tested outcomes, even when mutually adjusted for. Interaction analyses indicated that genetic predisposition to a high BMI moderated obesity-related risks, with weaker association between obesity and the risk of stroke and CPOD among individuals with a genetic predisposition to a higher BMI.

Conclusion: Obesity-related risks for mortality and NCDs were evident regardless of genetic predisposition. However, obesity influenced by genetic predisposition to a high BMI appeared less detrimental than obesity driven by non-genetic factors, particularly for stroke and COPD. These findings emphasize the importance of recognizing the heterogeneity of obesity and considering both genetic and environmental influences in shaping obesity-related risks. Further analyses will include measured and genetically predicted waist-hip ratio as well as additional NCDs, to provide a comprehensive examination of how genetic predisposition to higher adiposity influences associations with obesity-related health risks.

Reference

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AD13.03

Obesity prevalence in night shift workers compared to day workers across Europe – a preliminary analysis of the SHIFT2HEALTH online survey

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Introduction: Previous research has shown that working night shifts is associated with an increased body mass index (BMI) and a higher risk of developing overweight and obesity, but comparative data across EU countries are missing. Therefore, the aim of this study was to compare the prevalence of overweight and obesity between night shift workers and day workers and to analyse differences in dietary and physical activity behaviour among night shift workers with overweight/obesity and those with normal weight in Europe.

Tab. 1. Risk of mortality or NCDs, in relation to BMI and a polygenic score for BMI.

BMI	Mortality	Stroke	Cancer	COPD
Independent effect model				
Underweight	2.60 (2.35–2.88)	1.80 (1.27–2.56)	1.05 (0.92–1.19)	3.69 (3.01–4.47)
Normal weight	Ref	Ref	Ref	Ref
Overweight	0.94 (0.92–0.96)	0.99 (0.93–1.06)	1.05 (1.03–1.07)	0.84 (0.80–0.89)
Obesity	1.32 (1.29–1.36)	1.28 (1.19–1.37)	1.13 (1.10–1.16)	1.31 (1.25–1.40)
PGSBMI	1.10 (1.09–1.12)	1.10 (1.07–1.14)	1.04 (1.03–1.05)	1.21 (1.18–1.24)
Joint effect model				
Underweight	2.72 (2.45–3.01)	1.88 (1.32–2.67)	1.06 (0.93–1.21)	4.04 (3.33–4.93)
Normal weight	Ref	Ref	Ref	Ref
Overweight	0.92 (0.89–0.94)	0.97 (0.90–1.04)	1.04 (1.02–1.06)	0.80 (0.75–0.84)
Obesity	1.26 (1.23–1.30)	1.22 (1.13–1.32)	1.11 (1.09–1.14)	1.20 (1.13–1.27)
PGSBMI	1.09 (1.07–1.10)	1.08 (1.05–1.12)	1.03 (1.02–1.04)	1.20 (1.17–1.23)
Interaction model				
Underweight	3.10 (2.76–3.48)	2.21 (1.50–3.24)	1.17 (1.00–1.38)	4.55 (3.67–5.62)
Normal weight	Ref	Ref	Ref	Ref
Overweight	0.92 (0.88–0.94)	0.97 (0.90–1.04)	1.04 (1.02–1.06)	0.80 (0.75–0.84)
Obesity	1.27 (1.23–1.30)	1.24 (1.14–1.33)	1.11 (1.08–1.14)	1.22 (1.15–1.29)
PGSBMI	1.09 (1.07–1.12)	1.13 (1.06–1.19)	1.03 (1.01–1.05)	1.25 (1.20–1.31)
Underweight * PGSBMI	1.22 (1.10–1.34)	1.25 (0.89–1.75)	1.13 (1.00–1.27)	1.18 (0.98–1.42)
Overweight * PGSBMI	0.98 (0.96–1.00)	0.95 (0.89–1.02)	0.99 (0.97–1.01)	0.94 (0.89–1.00)
Obesity * PGSBMI	0.98 (0.95–1.01)	0.93 (0.86–1.00)	0.99 (0.97–1.01)	0.92 (0.86–0.98)

Hazard rate ratios (95% confidence intervals) of the outcomes mortality, stroke, cancer, or COPD in relation to BMI category and the PGSBMI, for the total sample. All models are adjusted for sex, ethnicity, and education, and age used as the underlying time scale. Independent effect models contain either BMI category or PGSBMI as predictors of the outcomes. Joint effect models contain BMI category and PGSBMI together as predictors of the outcomes. Interaction models contain main effects of BMI category and the PGSBMI, and an interaction term between BMI category and the PGSBMI. Statistically significant estimates (at the $\alpha < 0.05$ level) are presented in bold. BMI body mass index, COPD chronic obstructive pulmonary disease, NCDs non-communicable diseases, PGS polygenic score.

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Methods: This analysis presents preliminary data from an online survey conducted in eight European countries (AT, DE, DK, ES, GR, IT, NL, PL) within the framework of the EU-funded SHIFT2HEALTH project (https://shift2health.eu/). The survey collected self-reported data on BMI, occupation, work hours, shift work history, dietary behaviour (shortened Food Frequency Questionnaire), and physical activity (Godin Weekly Leisure Activity Score), among other factors. The prevalence of overweight and obesity is presented as percentages, and comparisons between BMI groups were made using the Chi-square test.
Results: A total of 3,936 individuals were included (mean age: 40 [SD: 10.6] years; 49.3% female). Of the participants, 38.6% worked in the health or social care sector, and 45.8% had a university degree or higher. Greece had the highest prevalence of overweight and obesity (59.2%), while the lowest prevalence was observed in Italy (40.5%; p<0.001). Regarding shift work, 52.3% currently worked night shifts, 24.7% had night shifts in the past, and 23.0% worked day shifts. Current night shift workers had a significantly higher prevalence of overweight and obesity (27.0% and 19.0%), followed by former night shift workers (35.8% and 16.3%) and day workers (32.0% and 13.8%; p<0.001). Night shift workers with overweight/obesity reported faster self-rated eating speeds (p<0.001) compared to night shift workers with normal weight. Significantly more night shift workers with overweight/obesity reported daily consumption of soft drinks (20.5% vs. 14.4%; p=0.005) and less daily intake of legumes (11.4% vs. 15.5%; p<0.001), vegetables (41.0% vs. 48.0%; p=0.016), and fruit (43.7% vs. 53.0%; p<0.001) compared to night shift workers with normal weight. In addition, night shift workers with overweight/obesity reported less leisure-time physical activity on a weekly basis (55.2% vs. 67.6%; p<0.001).
Conclusion: Night shift workers had a higher prevalence of overweight and obesity than day workers. Furthermore, night shift workers with a higher BMI tended to have less favourable dietary and physical activity behaviour. These results suggest the need for tailored interventions that focus on practical approaches to directly engage individuals, which is one of the aims of the SHIFT2HEALTH project. European companies and the health care sector should consider providing adaptable tools and services specifically for night shift workers to help prevent and reverse obesity within this group.

AD13.04

Exploring socioeconomic inequalities in healthy and sustainable diets using big data: An observational analysis of loyalty card data from a UK High Street Supermarket, 2022

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Introduction: There are wide socioeconomic inequalities in obesity and diet-related ill health. While interventions targeted at reducing these inequalities often focus on promoting healthy foods, within the context of climate change such strategies need to be mindful of encouraging sustainable diets as well. There is a lack of evidence on how healthy and sustainable diets intersect across socioeconomic inequalities. Existing studies often utilise self-reported diet recall surveys which can be subject to bias (e.g., under-reporting of food purchased).
Methods: Millions of loyalty card derived food and drink purchase records for Yorkshire and Humberside (UK) in 2022 were accessed. We focused on 'primary shoppers' who were estimated to be doing most of their shopping at the retailer (i.e., at least 10 shopping occasions and purchased from at least seven different food groups). We linked food and drink products to published estimates of mean global greenhouse gas emissions [1] and whether they were high in fat, salt and sugar (HFSS). We aggregated records to households as the primary unit of analysis. To adjust for potential selection bias in loyalty card records, and to allow more generalisable insights about the Yorkshire and Humberside population, we adjusted estimates using multilevel regression with post-stratification. Models were adjusted for loyalty card holder age, neighbourhood deprivation, population density, distance to nearest supermarket, and a random effect for neighbourhood location.
Results: A socioeconomic gradient was observed for HFSS purchases, as a proportion of total food and drink by weight (g). For example, households residing in the most deprived tenth of the population purchased 31% of

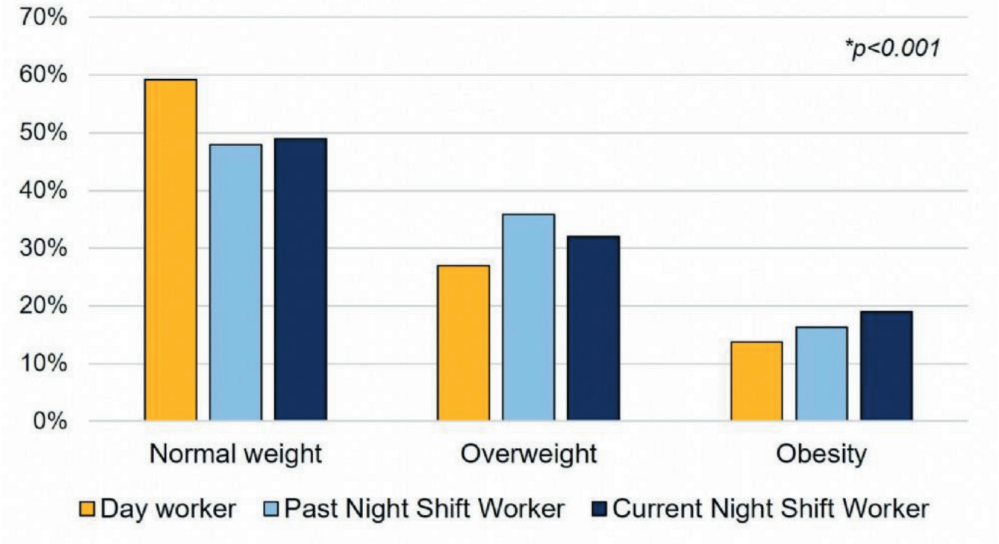


Fig. 1. Overweight and Obesity Prevalence.

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food and drink as HFSS compared to 28% in the least deprived tenth. In contrast, there was a flat socioeconomic gradient for greenhouse gas emissions with no substantive differences between the most and least deprived tenths. Foods that were HFSS were more expensive (83p vs 48p per 100g) and had higher greenhouse gas emissions (0.32 vs 0.21 kg CO2 equivalent per 100g) than non-HFSS foods.

Conclusion: Our study demonstrates a novel application of incidental big data repurposed to generate insights about dietary behaviours. We find that distinct socioeconomic inequalities in the purchase of unhealthy foods are not evident when we consider greenhouse gas emissions. This suggests that promoting sustainable diets is a broader societal issue than just limited to the most deprived populations. Promoting the consumption of non-HFSS foods that are low cost, healthy, and sustainable will be key to tackling socioeconomic inequalities.

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AD13.05

Metabolic risks and obesity in Mexico: an analysis using the Global Burden of Disease Study

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Introduction: In Mexico, the transition from infectious to non-communicable diseases and violence reflects lifestyle and urbanization changes. Overweight and obesity (OW/OB) have emerged as critical challenges with significant impacts on health loss, society, and the economy. The accelerated demographic, epidemiological, and nutritional transition has aggravated OW/OB problems.

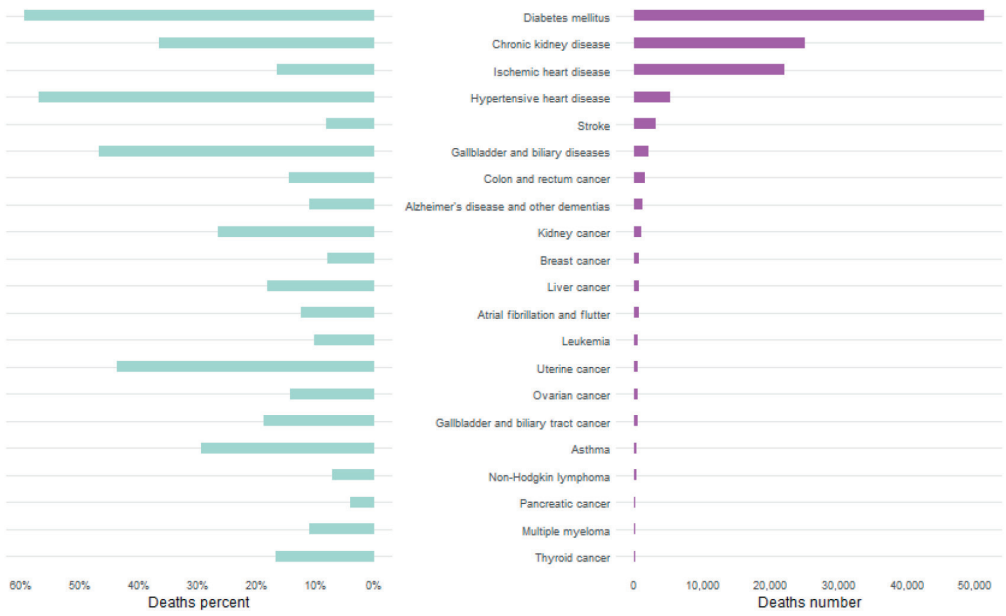
Methods: We used the Global Burden of Disease and Risk Factors 2021 study methodology to analyze mortality and DALYs associated with elevated body mass index (BMI) and attributable to environmental and occupational, behavioral, and metabolic risk factors. Data stratified by age, sex, and state were analyzed to assess changes in metabolic risk factors and patterns attributable to OW/OB.

Results: In 2021, overweight/obesity (OW/OB) caused 118,000 deaths, 10.6% of Mexico's total, and 4.2 million DALYs, 9% of the national total. Metabolic risks accounted for 19.8% of 14.9 million DALYs from risk factors.

Diabetes mellitus, responsible for 64.4% of high BMI-related deaths (76,000 fatalities), was the leading cause linked to OW/OB. Chronic kidney disease and ischemic heart disease caused around 30,000 and 26,000 deaths, respectively. High BMI's burden increased across all age groups, notably among those aged 70+ (14,433 DALYs per 100,000) and 50-69 years (10,057 DALYs per 100,000), underscoring a growing public health issue.

Metabolic risks, especially high fasting plasma glucose and high BMI, were the largest disease burdens across all states. States with lower Sociodemographic Index (SDI), like Oaxaca, Guerrero, and Chiapas, had the highest malnutrition, air pollution, and occupational risks, while higher SDI states had more tobacco use, elevated LDL cholesterol, and low physical activity.

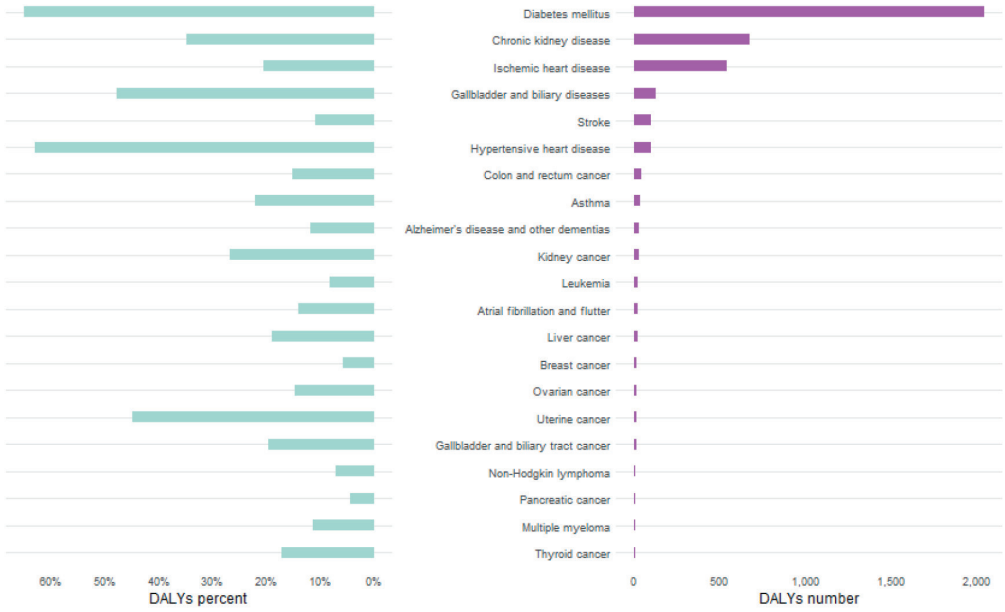
Conclusion: Despite declines in the metabolic trends, the growing burden of overweight and obesity is still considerable and poses significant public health challenges in Mexico. This crisis is not just a medical concern but a societal challenge, deeply intertwined with metabolic risks that have surged, particularly in socioeconomically disadvantaged regions. The findings underscore a need for a paradigm shift in public health strategy. It is imperative to transition from reactive health measures to proactive, comprehensive interventions that encompass dietary, behavioral, and policy changes. Multisectoral interventions are crucial to strengthen the health system and address the underlying factors of obesity and metabolic risks.



In Mexico during 2021, high BMI contributed to 118,000 deaths, with diabetes being the leading cause at 76,000 deaths (64.4%), followed by chronic kidney disease at 30,000 (23.7%), and heart disease at 26,000 (20.7%). Smaller but significant numbers were seen in stroke (10,000), hypertensive heart disease (4,400), and Alzheimer's (4,000). Looking at it another way, high BMI was responsible for 55% of all diabetes deaths, 50.7% of uterine cancer deaths, and nearly half of all hypertensive heart disease deaths in the country.

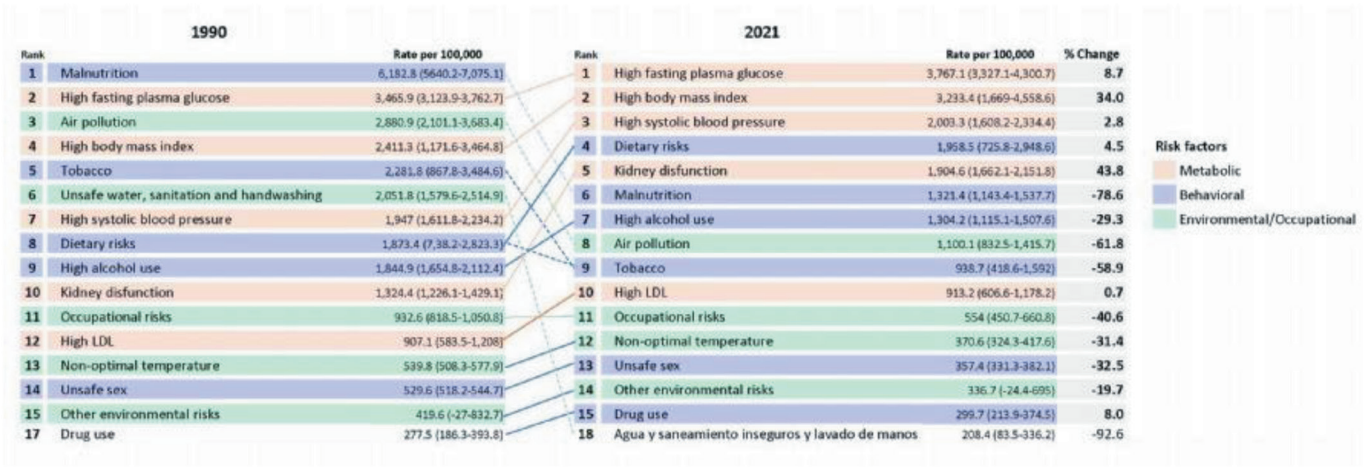
Fig. 1. High body mass index as risk factor for mortality due to different diseases. Mexico, 2021.

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In 2021, high BMI led to a loss of 4.2 million DALYs (disability-adjusted life years) in Mexico. The biggest impact was seen in six main conditions: diabetes topped the list with 2 million DALYs, followed by chronic kidney disease (675,000), heart disease (538,000), gallbladder disease (124,000), stroke (101,000), and hypertensive heart disease (97,000). Together, these conditions accounted for 85.6% of all DALYs lost. Looking at specific diseases, high BMI was responsible for 65% of diabetes cases, 62.9% of hypertensive heart disease, 47.7% of gallbladder disease, 44.9% of uterine cancer, 34.7% of kidney disease, and 26.7% of kidney cancer.

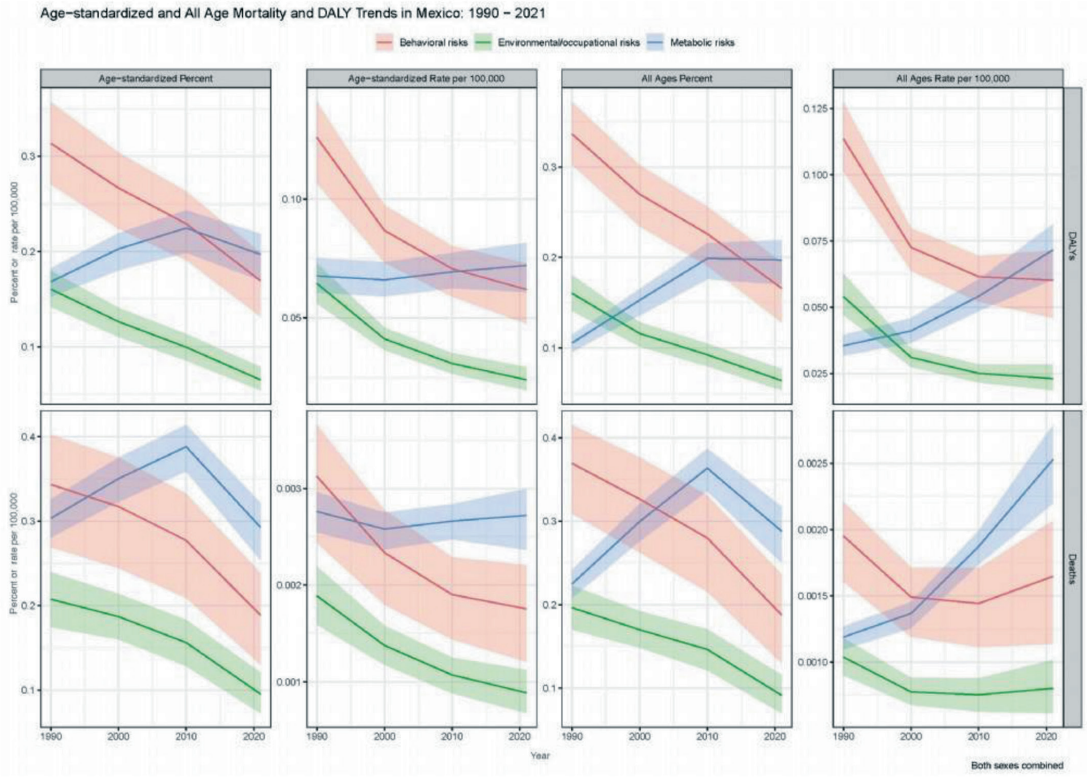
Fig. 2. High body mass index as risk factor for disability-adjusted life years (DALYs) due to different diseases. Mexico, 2021.



Mexico's health patterns have shifted dramatically over three decades. In 1990, the main health threats were malnutrition, high blood sugar, and air pollution. By 2021, the picture had changed - high blood sugar remained a major concern, but was now joined by obesity and high blood pressure as the top issues. Almost all metabolic health problems (except low bone density) became more serious during this time. While dietary issues worsened, climbing to fourth place with a 4.5% increase, there was good news in other areas. Significant improvements were seen in malnutrition (down 79%), tobacco use (down 59%), and alcohol abuse (down 29%). Environmental conditions also got much better, with water safety issues dropping by 92% and air pollution declining by 61%.

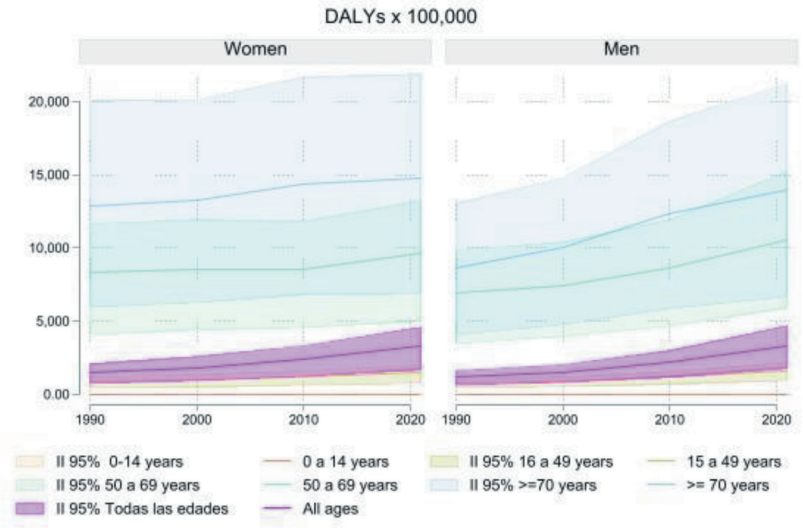
Fig. 3. Main risk factors for disability-adjusted life years (DALYs) in Mexico for 1990 and 2021. Risk factors ordered by age-adjusted DALYs rate per 100,000 population, both sexes.

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Between 1990 and 2021, an interesting shift occurred in health risk factors across Mexico. While metabolic risks (like high blood pressure and obesity) increased by 6.5%, there was actually good news in other areas. Behavioral risks dropped significantly by 50.8%, and environmental risks saw an even bigger decrease of 62.9%. However, these changes weren't uniform across the country - different states experienced varying patterns of change.

Fig. 4. Mortality and disability-adjusted life years (DALYs) attributable to risk factors in Mexico from 1990 to 2021.



When looking at the impact of health issues (DALYs), older adults aged 70 and above were the most affected group by far. To put it in perspective, they experienced a staggering rate of 14,433 cases per 100,000 people. Following behind were middle-aged adults between 50 and 69, with about 10,057 cases. Young adults aged 15 to 49 showed significantly lower numbers at 1,530 cases, while children under 14 had the lowest rate at just 8.6 cases per 100,000 people. This isn't surprising, really - as we've seen, having a high body mass index (H-BMI) tends to become more of an issue as people age. Over time, these numbers have been climbing by about 3% each year, except for one bright spot: children under 15 actually showed a small improvement, with their numbers dropping by 0.3% annually.

Fig. 5. Trend in the rate of disability-adjusted life years due to high body mass index by age group. Mexico, 1990 to 2021.

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Arreola-Ornelas H, Merino-Juárez GA, et al. "Burden of overweight and obesity in Mexico from 1990 to 2021." Gaceta Médica de México, 2023;159:543-556.

Conflict of Interest: None disclosed

Funding: No funding to report

AD13.06

Body composition and risk of obesity-related cancers in the Danish Diet, Cancer and Health cohort

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Introduction: Overweight and obesity are well-established risk factors for several cancer types. According to the World Cancer Research Fund (WCRF) and the International Agency for Research on Cancer (IARC), overweight and obesity in adult life increase the risk of 15 cancer types including colorectal, aggressive prostate and post-menopausal breast cancer. Previous studies have commonly used body mass index (BMI) as an indicator for obesity, however, BMI does not distinguish between fat mass (FM) and fat-free mass (FFM). In this prospective cohort study, we examined the associations between FM and FFM with the risk of overall and site-specific obesity-related cancers.

Methods: We included 55,780 individuals (29,142 women) aged 50 – 64 years from the Danish Diet, Cancer and Health cohort established between 1993 and 1997. FM and FFM were calculated from bioelectrical impedance measurements. Information on cancer diagnoses were available through linkage to the Danish Cancer Register from baseline to 2022. We used Cox models to estimate sex-specific hazard ratios (HR) and 95% confidence intervals (CI) of overall and 15 site-specific obesity-related cancers for the exposures of height-normalised indices of FM (FMI) and FFM (FFMI) (per 1 kg/m2). Analyses were mutually adjusted with additional adjustment for lifestyle factors and socioeconomic status.

Results: For male participants, each unit increase in FMI was positively associated with colorectal cancer (HR: 1.04, 95% CI 1.00-1.07), liver cancer (HR: 1.16, 95% CI 1.06-1.27), kidney cancer (HR: 1.10, 95% CI 1.02-1.18), and overall obesity-related cancers (HR: 1.02, 95% CI 1.01-1.04). FFMI was not significantly associated with any cancer sites. For female participants, each unit increase in FMI was positively associated with oesophageal adenocarcinoma (HR: 1.39, 95% CI 1.00-1.92), endometrial cancer (HR: 1.07, 95% CI 1.03-1.12), ovarian cancer (HR: 1.07, 95% CI 1.01-1.13), and slightly with overall obesity-related cancers (HR: 1.01, 95% CI 1.00-1.02). Each unit increase in FFMI was positively associated with cancer in cardia of the stomach (HR: 1.43, 95% CI 1.00-2.03), thyroid cancer (HR: 1.41, 95% CI 1.07-1.87), multiple myeloma (HR: 1.33, 95% CI 1.08-1.63), post-menopausal breast cancer (HR: 1.05, 95% CI 1.00-1.10) and overall obesity-related cancer (HR: 1.04, 95% CI 1.01-1.08).

Conclusion: Our findings suggest that body composition measures, i.e., FM and FFM, are important indicators of cancer risk. The associations with these measures seem to vary by sex and cancer type; higher FM appears to be a risk factor for some cancer sites among men, while higher FM and FFM appear to be risk factors among women depending on cancer type.

Conflict of Interest: Unrelated to this work J Baker has received consulting fees from Novo Nordisk A/S. L Mellemkjær has an immediate family member who is employed at Novo Nordisk A/S and an immediate family member who owns stocks in Novo Nordisk A/S.

Funding: Research relating to this abstract was funded (grant number IIG_FULL_2023_024) by Wereld Kanker Onderzoek Fonds (WKOF), as part of the World Cancer Research Fund International grant programme.

AD14 - Molecular Signals Driving Obesity in Children

AD14.01

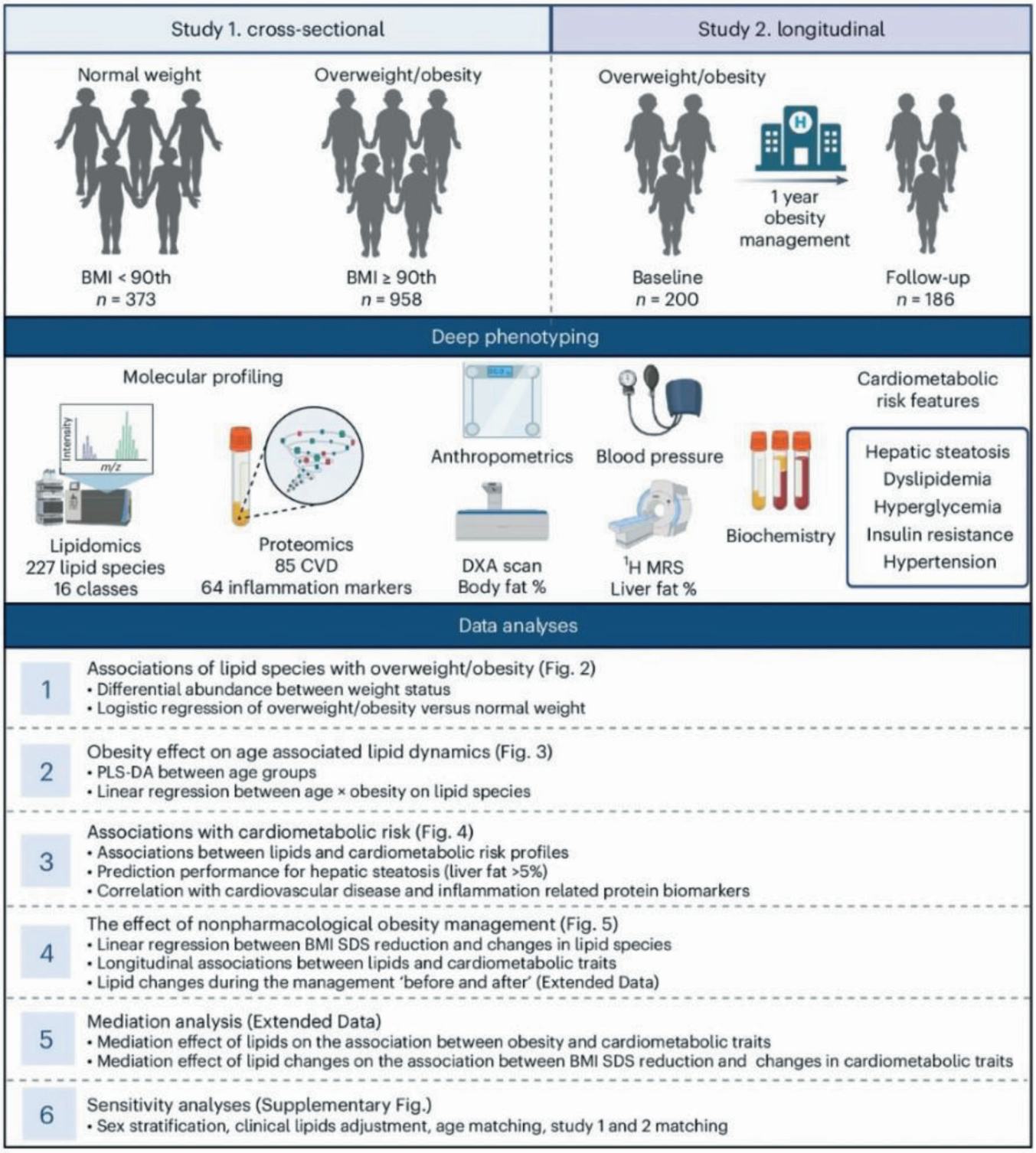
Lipid profiling identifies modifiable signatures of cardiometabolic risk in children and adolescents with obesity

Huang, Y.[1]*; Sulek, K.*[2]*; Stinson, S. E.*[1]*; Holm, L. A.*[3]*; Kim, M.*[2]*; Trost, K.*[4]*; Hooshmand, K.*[2]*; Lund, M.*[5]*; Fonvig, C.*[6]*; Juel, H. B.*[1]*; Nielsen, T.*[7]*; Ängquist, L.*[1]*; Rossing, P.*[8]*; Thiele, M.*[9]*; Krag, A.*[9]*, Holm, J.-C.*[6]*; Legido Quigley, C.*[10]*; Hansen, T.*[1]

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Pediatric obesity is a progressive, chronic disease that can lead to serious cardiometabolic complications. Here we investigated the peripheral lipidome in 958 children and adolescents with overweight or obesity and 373 with normal weight, in a cross-sectional study. We also implemented a family-based, personalized program to assess the effects of obesity management on 186 children and adolescents in a clinical setting. Using mass spectrometry-based lipidomics, we report an increase in ceramides, alongside a decrease in lysophospholipids and omega-3 fatty acids with obesity metabolism. Ceramides, phosphatidylethanolamines and phosphatidylinositols were associated with insulin resistance and cardiometabolic risk, whereas sphingomyelins showed inverse associations. Additionally, a panel of three lipids predicted hepatic steatosis as effectively as liver enzymes. Lipids partially mediated the association between obesity and cardiometabolic traits. The nonpharmacological management reduced levels of ceramides, phospholipids and triglycerides, indicating that lowering the degree of obesity could partially restore a healthy lipid profile in children and adolescents.

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Lipidomic profiles were measured in 373 children and adolescents with normal weight and 958 with overweight or obesity. We investigated lipid dysregulation in relation to overweight/obesity, cardiometabolic risk profiles, known CVD-related and inflammatory markers, and the predictive ability to detect hepatic steatosis. In addition, lipidomic profiles were measured in a subset of children and adolescents who received nonpharmacological obesity treatment. The lipidome response to BMI SDS reduction and longitudinal associations between lipids and cardiometabolic traits were examined. Mediation and sensitivity analyses were conducted. Created with BioRender.com.

Fig. 1. Schematic study design.

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AD14.02

Early childhood growth trajectories in children with monogenic obesity. A European collaboration project

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Introduction: Monogenic defects in the leptin-melanocortin pathway can cause hyperphagia and severe, early-onset obesity. Knowledge of the natural history of anthropometric parameters in patients with monogenic obesity is essential for diagnosis, but reliable data on early childhood weight and height development are lacking. This study aimed to evaluate the natural history of height, weight, and BMI development in early childhood in a European cohort of patients with monogenic obesity.
Methods: This multicenter cohort study included 147 patients with biallelic (likely) pathogenic variants in the LEP (n=9), LEPR (n=53), POMC (n=10), or MC4R (n=16) gene, or monoallelic (likely) pathogenic MC4R variants (n=59) from six European centers. Weight, height, and BMI data from birth to five years of age were compared with controls with obesity without a known genetic cause (n=113). Diagnostic performance of BMI as a predictive marker was also evaluated.
Results: Individuals with biallelic variants had significantly higher BMIs than monoallelic MC4R carriers ($p < 0.05$) and controls ($p < 0.05$) from six months of age onwards. Patients with biallelic LEP, LEPR, and MC4R variants showed a steep BMI increase in the first year of life, followed by a plateau until five years of age. In contrast, patients with biallelic POMC variants had a less steep BMI increase during the first year of life, followed by a continuous BMI increase until five years of age. The optimal BMI cut-off to distinguish biallelic variants from controls was ≥24.0 kg/m² at two years of age (sensitivity: 0.96, AUC: 0.96, $p < 0.01$). However, such cut-off was not found for monoallelic MC4R variants. Body length at birth was similar across groups. Accelerated growth was only observed in patients with biallelic MC4R variants by one year of age, while patients with other forms of monogenic obesity grew within the growth references.
Conclusion: This large multicenter cohort study reveals distinct early childhood BMI trajectories in patients with monogenic obesity based on the genetic variants. A BMI cut-off of ≥24 kg/m² at two years of age was identified as optimal threshold for recommending genetic screening for monogenic obesity. Accelerated growth is an additional distinguishing feature in patients with biallelic MC4R variants.

AD14.03

A novel syndromic obesity disorder mimicking Prader-Willi Syndrome caused by biallelic variations in *SREK1*

Saeed, S.[1]; *Siegert, A. M.*[2]; *Tung, L.*[2]; *Khanam, R.*[3]; *Janjua, Q. M.*[4]; *Manzoor, J.*[5]; *Lam, B. Y. H.*[2]; *Awad, S.*[2]; *Derhourhi, M.*[1]; *O'rahilly, S.*[2]; *Goldstone, A. P.*[6]; *Arslan, M.*[3]; *Bonnefond, A.*[1]; *Yeo, G. S. H.*[2]; *Froguel, P.*[7]

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Introduction: Obesity is a highly heritable behavioural disorder, driven by genes predominantly expressed in the brain. Studies on monogenic obesity have revealed key neuronal pathways, such as the leptin-melanocortin system, that regulate appetite and energy balance, paving the way for novel therapies. Syndromic obesity is traditionally associated with developmental and neurological abnormalities. Recent findings from the Severe Obesity in Pakistani Population (SOPP) cohort, comprising children from consanguineous families, have identified *P4HTM* as a gene linked to severe obesity and brain defects. We hypothesize that many syndromic obesity cases remain undiscovered, emphasising the need to investigate rare variants and their effects on hypothalamic function and energy regulation.
Methods: We analysed exome sequencing data from 463 children living with severe obesity from SOPP and over 1,000 geographically matched controls. Genes carrying homozygous, potentially damaging variants were systematically prioritized. To confirm their relevance, we performed protein modeling to assess the functional consequences of the variants. Additionally, we conducted experiments using iPSC-derived hypothalamic neurons, complemented by RNA sequencing. Subsequently, targeted clinical re-examinations were performed.
Results: We identified three unrelated families harbouring homozygous variants in the *SREK1* gene, exhibiting severe obesity and developmental delays (Fig 1A). SREK1, a member of the serine/arginine-rich splicing factor family (SRFS), encodes a critical regulator of RNA splicing and is prominently expressed in the hypothalamus. Protein modeling suggested that the RNA Recognition Motif (RRM) variants (P95L, T194M) impair RNA-binding, while the E601K variant likely affects spliceosome function. Using iPSC-derived hypothalamic neurons, we demonstrated that these variants result in differential expression of SNORD115 and SNORD116, with the latter being a well-known driver of hyperphagia and weight gain in Prader-Willi Syndrome (PWS) (Fig 1B). qPCR analysis

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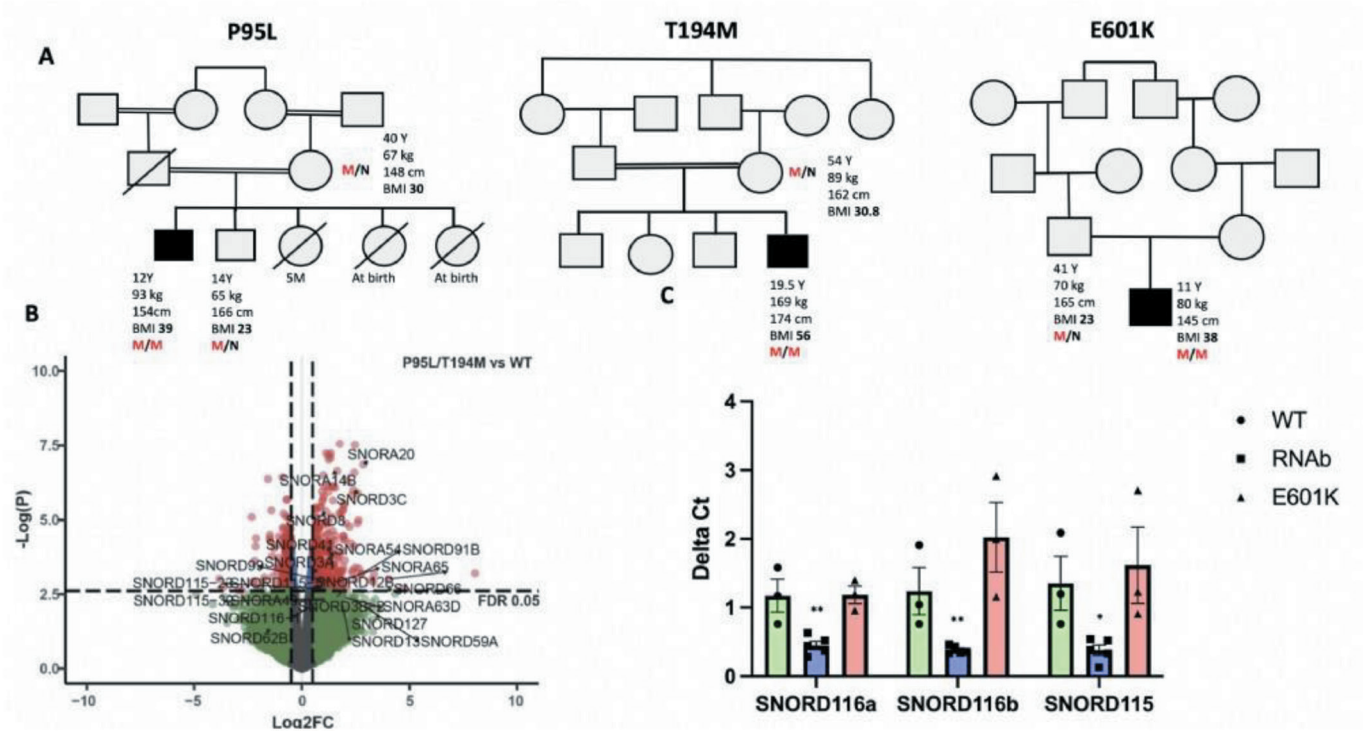


Figure1 1 (A) Pedigrees of three consanguineous families showing SREK1 variants (P95L, T194M, and E601K). (B) Volcano plot of differentially expressed genes (DEGs) comparing RNAb domain variants to wild-type (WT). Dysregulated small nucleolar RNAs (snoRNAs), especially SNORD115 and SNORD116, are highlighted. (C) The mRNA levels of SNORD116 and SNORD115 were significantly reduced in the RNAb samples compared to the wild-type (WT) control. The expression levels were normalised to GAPDH. Statistical significance was calculated using multiple unpaired t-test based on data from at least three independent experiments (**p < 0.01, *p<0.05).

Fig. 1.

confirmed that SNORD115 and SNORD116 are significantly downregulated in neurons expressing the RRM domain variants (P95L, T194M), but not in neurons expressing the C-terminal variant (E601K) (Fig 1C). Clinical re-evaluations further corroborated these findings, revealing overlapping phenotypic features with PWS, including hyperphagia, developmental delays, hypotonia and distinctive facial characteristics.

Interpretation: We show that biallelic variants in *SREK1* lead to a novel form of syndromic obesity by disrupting RNA splicing and associated molecular pathways, similar to those seen in PWS. Our findings highlight the critical role of RNA regulatory networks in hypothalamic function and energy regulation, offering new insights into the genetic underpinnings of syndromic obesity.

Conflict of Interest: None declared.

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AD14.04

Accelerated Epigenetic Aging as a Biomarker of Pediatric Obesity: Insights from Pubertal Development

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Introduction: Obesity, a multifactorial disease with a strong epigenetic component influenced by environmental factors, increases susceptibility to age-related diseases. Estimating biological age through DNA

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methylation via epigenetic clocks provides deeper insights into this phenomenon. Although prior studies suggest accelerated aging in individuals with overweight or obesity, findings vary depending on the epigenetic clocks and populations studied, particularly in pediatric and adolescent cohorts. This study aims to validate the application of epigenetic clocks during pubertal development and analyze the impact of obesity on the difference between biological and chronological age (age acceleration).

Methods: Data were drawn from the PUBMEP study, comprising 123 children with and without obesity, evaluated before and during puberty. Height, weight, and waist circumference (WC) were measured to calculate BMI and WC z-scores. Body composition, including total fat mass, was assessed by Dual-energy X-ray absorptiometry (DXA), and the derived fat mass index (FMI) was calculated. Blood pressure (BP), fasting levels of insulin, glucose, HDL-c, and triacylglycerols (TAG) were measured following international guidelines and standardized protocols, and z-scores for cardiometabolic traits (BP, Homeostatic Model Assessment [HOMA-IR], HDL-c, and triacylglycerols) were computed. Pubertal staging was determined based on Tanner classification. DNA methylation profiling was performed using the Illumina 850k platform. Epigenetic clocks were estimated using the R package methylclock, and multivariate analyses were conducted to explore associations between age acceleration and clinical traits.

Results: Significant correlations were observed between biological age, estimated using epigenetic clocks, and chronological age across the cohort. Association analyses revealed a significant positive relationship between body mass index, HOMA-IR index, and waist circumference with epigenetic age acceleration. In the prepubertal stage, waist circumference was significantly associated with age acceleration in boys, whereas during puberty, this association was significant only in girls.

Conclusions: The findings suggest that children with accelerated epigenetic age tend to exhibit higher levels of obesity and adiposity, with sex- and pubertal stage-specific effects. These results underscore the importance of considering developmental stages and sex-specific differences in the interaction between metabolic health and epigenetic aging processes.

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AD14.05

Epistasis of GLP-1 signaling related genetic variants suggests involvement in the regulation of appetitive traits among pre-adolescents

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Introduction: GLP-1 receptor agonists are hypothesized to reduce obesity in part through appetite regulation. Despite their therapeutic benefits, the precise physiological mechanisms of their effects are unclear. We examined common endogenous sequence variations proximal to several genes within the GLP-1 signaling pathway to assess their contribution to clinical descriptors of appetitive behavior in children.

Methods: Among 247 children from two studies aged 9-12 years of European ancestry with single nucleotide polymorphism (SNP) array data, we selected 33 independent, common SNPs within 20 kbps of four genes: 1) *GCG* (encoding multiple appetite-related peptides including GLP-1) 2) *PCSK1* (*GCG* post-translational processing), 3) *DPP-IV* (GLP-1-degrading enzyme), and 4) *GLP-1R* (GLP-1 receptor). From the parent-reported Child Eating Behavior Questionnaire (CEBQ), we computed a composite score to characterize appetitive traits that influence food intake. We applied a quantitative multifactor dimensionality reduction (QMDR) algorithm with 10-fold cross validation (CV) to search for one through four-way interactions among the candidate SNPs related to the composite appetite score, adjusting for age, sex, parent education, study, and genetic principal components. Using variants selected by QMDR, we computed adjusted linear regression models to quantify variance in appetitive traits explained by the optimal one through four-way interactions. Subsequent permutation tests assessed how variance explained at each level of interaction compared to a null distribution that jointly accounted for SNP selection and regression fitting. These steps were further assessed including the additional 28 participants of non-European ancestry (total n = 275).

Results: The optimal genetic model identified using QMDR was a four-way interaction (testing t = 3.95, CV consistency = 6/10) that included one SNP proximal to each of *GCG* (rs13429709), *PCSK1* (rs156003), *DPP-IV* (rs17574), and *GLP-1R* (rs2235868). Adjusted linear regression identified a significant association of this interaction with the composite appetite score (adjusted $R^2 = 0.212$, $p = 0.0007$). Under the permutation test accounting for both using QMDR to select SNPs and regression model fitting, this was consistent with type I error < 0.05. Repeating QMDR in the all-ancestry sample selected the same SNPs for the four-way interaction (testing t = 3.99, CV consistency = 7/10), with similar variance explained in the outcome (adjusted $R^2 = 0.194$, $p = 0.0005$). Querying the GTEx Portal for eQTLs suggests these SNPs are related to the expression of GLP-1 signaling-related genes.

Conclusion: Genetic epistasis related to endogenous variation in the GLP-1 signaling pathway was associated with food intake-promoting appetitive traits among pre-adolescents. These observations suggest the involvement of this signaling system in the regulation of appetitive behavior and are consistent with the known clinical effects of GLP-1R agonists on appetite. Future studies should validate these findings in an external dataset and assess these genotypes in terms of other eating behavior and obesity-related outcomes.

AD14.06

Identification of Novel Epigenetic Biomarkers Associated with Childhood Obesity and Early Development of Cardiometabolic Risk Factors

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Introduction: Childhood obesity is a growing health challenge worldwide, predisposing children to early-onset metabolic disturbances. Recent studies have highlighted the importance of epigenetic mechanisms, particularly DNA methylation, as potential biomarkers for predicting cardiometabolic risk. The identification of these early markers could be key to informing preventive strategies and interventions during crucial developmental windows.
Methods: We investigated epigenetic profiles in two Spanish pediatric cohorts: (1) a longitudinal discovery population (n = 90) and (2) a cross-sectional validation population (n = 237), both including participants aged 2 to 18 years. Height, weight, and waist circumference (WC) were measured to calculate BMI and WC z-scores. Body composition, including total fat mass, was assessed by Dual-energy X-ray absorptiometry (DXA), and the derived fat mass index (FMI) was calculated. Blood pressure (BP), fasting levels of insulin, glucose, HDL-c, and triacylglycerols (TAG) were measured following international guidelines and standardized protocols, and z-scores for cardiometabolic traits (BP, HOMA-IR, HDL-c, and triacylglycerols) were computed. Pubertal staging was determined based on Tanner classification. DNA methylation was quantified in white blood cells using the Illumina MethylationEPIC 850K array. Linear models were performed to identify CpG sites associated with adiposity and cardiometabolic risk factors, adjusting for age, sex, center and white cell proportions. Significant loci in the discovery cohort (193 CpG sites annotated in 89 genes) were tested for replication in the validation cohort.
Results: Our analyses revealed multiple CpG sites displaying differential methylation associated with adiposity traits and early cardiometabolic risk. Of particular note, *ABCG1*, *DMN3*, *EEFSEC*, *TINAGL1*, and *VASN* emerged as promising candidates, with the strongest associations observed in pubertal children. Interestingly, *ABCG1*, widely reported in the literature for its association with obesity and cardiometabolic risk in adults, showed the strongest associations in our study. These findings highlight the potential utility of epigenetic biomarkers in understanding and potentially predicting early-onset metabolic disturbances in pediatric populations.
Conclusion: These findings shed light on emerging epigenetic markers linked to childhood obesity and the early development of cardiometabolic risk. Future research should investigate larger, more diverse populations and employ refined analytical methods to confirm these associations. Early detection and targeted interventions based on epigenetic signatures may help mitigate the progression of obesity-related complications in pediatric populations.

Conflict of Interest: None.

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AD15 - Incretin Alchemy: Transforming Obesity Management with Hormonal Science

AD15.01

Tirzepatide vs semaglutide for the management of obesity and overweight: a subgroup indirect treatment comparison of body composition outcomes from SURMOUNT-1 and STEP 1

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Introduction: Changes in body composition are of key importance in the context of obesity management, with the distribution of fat and lean body mass (BM) linked to mortality risks, cardiometabolic complications and the challenge of weight regain. However, there is no published comparison of body composition outcomes between the obesity management medications tirzepatide (TZP), a glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist (RA) and semaglutide, a GLP-1 RA. Here, body composition outcomes were compared for TZP and semaglutide in an indirect treatment comparison (ITC).
Methods: A Bucher ITC was conducted on SURMOUNT-1 (SMT-1) and STEP 1 trial subgroups that underwent dual-energy X-ray absorptiometry: adults without type 2 diabetes and with obesity (BMI ≥30 kg/m2), or overweight (BMI ≥27 kg/m2) with ≥1 obesity-related complication, with BMI ≤40 kg/m2 for STEP 1 and no upper BMI limit for SMT-1. Both populations were suitably similar for inclusion in an ITC. Each TZP dose (SMT-1: 5 mg [n=38], 10 mg [n=39], 15 mg [n=43], all once weekly [QW]) was compared with semaglutide 2.4 mg QW (STEP 1: n=95) via placebo (SMT-1: n=36, STEP 1: n=45), all adjunct to reduced-calorie diet and increased physical activity. Efficacy estimand data (patients remaining on treatment with no rescue medication) were used at the primary timepoint (SMT-1: Week 72; STEP 1: Week 68) to investigate changes in absolute (kg) and relative (proportion of total BM, %) fat and lean mass.
Results: TZP 15 mg had a statistically significant greater reduction in absolute and relative fat mass (mean difference [95% CI]: −4.87 kg [−9.64, −0.10], −3.50 %pt. [−6.66, −0.34], resp.) versus semaglutide 2.4 mg, while TZP 5 and 10 mg had non-significant trends of greater or similar reductions in absolute (−0.57 kg [−5.41, 4.27], −4.17 kg [−8.94, 0.60], resp.) and relative fat mass (−0.80 %pt. [−4.03, 2.43], −2.40 %pt. [−5.60, 0.80], resp.). Versus semaglutide 2.4 mg, TZP 5, 10 and 15 mg had comparable reductions in absolute regional visceral fat mass (0.05 kg [−0.19, 0.29], −0.05 kg [−0.28, 0.18], −0.12 kg [−0.35, 0.11], resp.) as well as non-significant trends of smaller or similar reductions in absolute lean mass (2.14 kg [−0.01, 4.29], 0.04 kg [−2.11, 2.19], 0.84 kg [−1.28, 2.96], resp.) and greater increases in relative lean mass (0.90 %pt. [−2.14, 3.94], 2.30 %pt. [−0.74, 5.34], 3.40 %pt. [0.40, 6.40], resp.) with TZP 15 mg reaching statistical significance for the latter.
Conclusion: This ITC showed that, compared to semaglutide 2.4 mg, TZP 15 mg was associated with statistically significant greater reductions in absolute and relative fat mass, indicating more favourable changes in body composition. Although all TZP doses and semaglutide 2.4 mg were associated with decreases in absolute lean mass, the ITC showed that TZP 15 mg was associated with a statistically significant greater increase in relative lean mass (i.e., a smaller relative decrease in lean mass versus total BM) compared to semaglutide 2.4 mg. However, the small subgroup sizes and supplementary nature of these outcomes in both trials limit the conclusions of this ITC.

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AD15.02

Association of glucagon-like peptide-1 receptor agonists treatment post-metabolic bariatric surgery with primary prevention of MACE

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Introduction: In patients with obesity and diabetes, the separate advantage of Bariatric Metabolic Surgery (BMS) and Glucagon-Like Peptide-1 Receptor Agonists (GLP-1RA) in reducing Major Adverse Cardiovascular Events (MACE) is well-established. However, the benefit of GLP-1RA treatment post-BMS for primary prevention of MACE is unclear. The objective of this study was to assess the association of GLP-1RA treatment post-BMS with first incidence of MACE or all-cause mortality, as well as its association with BMI and HbA1c levels in patients living with obesity and diabetes.

Methods: This was an observational, retrospective cohort study. Data were obtained from the electronic medical records of Clalit Health Services. Post-BMS patients (2008-2022) aged≥24 years, with diabetes and obesity (BMI≥30 kg/m2), who had no prior history of ischemic heart disease, ischemic stroke, or congestive heart failure, and who were not treated with GLP-1RA prior to BMS were included in the study. For each individual who initiated GLP-1RA post-BMS, one individual who did not initiate GLP-1RA (BMS-only) was matched based on age, sex, BMI, and the number of years since BMS. Multivariable Cox proportional-hazards regression model was used to evaluate the association between exposure to GLP-1RA post-BMS and incidence of MACE or all-cause mortality. Follow-up began at the initiation of GLP-1RA (index date) and ended on December 31, 2023.

Results: Out of 2,832 eligible individuals, 411 matched pairs were included in the study (mean [SD] age: 57.9 [9.05] years; 594 [72,3%] women). BMS-only group and GLP-1RA post-BMS group were followed for an average of 1.7 (0.64) years and 1.8 (0.64) years, respectively. During this follow up, 3.2% (n=13, 151.9 per 100,000 person months) and 1.2% (n=5, 57.2 per 100,000 person months) new cases of MACE or all-cause mortality occurred in BMS only and GLP-1RA post-BMS group, respectively. Multivariable Cox model demonstrated lower risk for MACE or all-cause mortality among those who initiated GLP-1RA compared to BMS-only (HR: 0.33; 95% CI, 0.11 - 0.98).

Conclusion: Treatment with GLP-1RA post-MBS was associated with 67% reduced risk for MACE or all-cause mortality. Additional research is needed to establish the benefit of GLP-1RA post-BMS and determine the timing for which this intervention is optimal.

Conflict of Interest: Drs Dicker, Lavie, and Reges reported receiving grants from the Israel Science Foundation outside the submitted work. Dr Dicker reported receiving grants, personal fees, and non-financial support from NovoNordisk and Eli Lilly; and personal fees and non-financial support from Boehringer Ingelheim outside the submitted work. No other disclosures were reported.

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AD15.04

Early Clinical Benefit of Semaglutide in Adults with Overweight or Obesity and Cardiovascular Disease: A Secondary Analysis of the SELECT Trial

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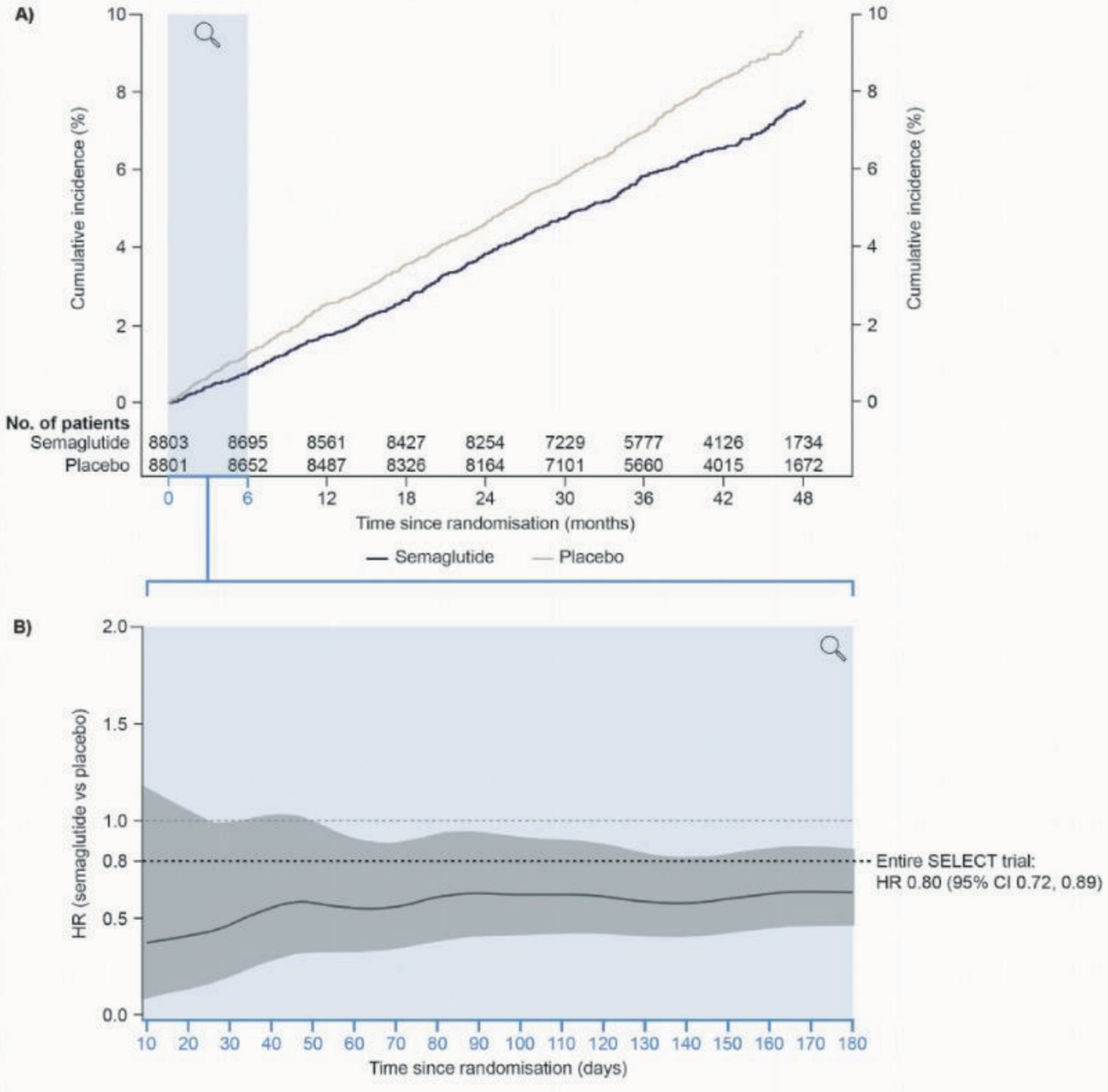
Introduction: In the SELECT trial, semaglutide reduced major adverse cardiovascular (CV) events (MACE) by 20% versus placebo over 39.8 months (mean) in patients with overweight/obesity (body mass index ≥27 kg/m²) and established cardiovascular disease (CVD) without diabetes. This secondary analysis examined the time to onset of the benefit on MACE and changes in other parameters of interest in the early stages post-randomisation.

Methods: SELECT randomised 17,604 patients to once-weekly subcutaneous semaglutide or placebo (planned titration to 2.4 mg at week 16), in addition to standard of care. The primary endpoint of MACE was defined as a composite of CV death, nonfatal myocardial infarction or nonfatal stroke. Secondary endpoints included death from CV causes, a heart failure (HF) composite (death from CV causes or hospitalisation or an urgent medical visit for HF) and death from any cause. Here, the difference in CV events with semaglutide versus placebo was evaluated over truncated intervals from randomisation to each specified day up to 6 months post-randomisation, using Cox proportional hazards models with treatment as a fixed factor. Estimated hazard ratios (HRs) and 95% confidence intervals (CIs) unadjusted for multiple comparisons are reported for months 0–3 and 0–6 and displayed as a smoothed curve. Cumulative incidence curves for MACE by treatment group were analysed using the Aalen–Johansen estimator.

Results: The HR for MACE for the entire trial was 0.80 (95% CI 0.72, 0.89) and the cumulative incidence curves for time to first MACE showed an early separation between treatment groups (Figure 1A). Figure 1B displays HRs and 95% CIs over the first 6 months post-randomisation. Nominally significant benefit of semaglutide on MACE was observed over the first 3 months (HR 0.63; 95% CI 0.41, 0.95) and the first 6 months (HR 0.60; 95% CI 0.44, 0.81). Similar early efficacy estimates were observed over the first 6 months for death from CV causes (HR 0.50; 95% CI 0.26, 0.93), the HF composite (HR 0.41; 95% CI 0.24, 0.67) and death from any cause (HR 0.60; 95% CI 0.36, 1.01). At the planned trial visits, the treatment difference (semaglutide – placebo) in mean body weight was −1.1% (95% CI −1.2, −1.1) at week 4 and −3.6% (95% CI −3.7, 3.5) at week 12. Additional analyses of the early MACE separation for semaglutide versus placebo by individual MACE components, additional clinical outcomes, patient subgroups and other parameters changing during the early post-randomisation stages of the trial will be provided.

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Figure 1. Time to first EAC-confirmed MACE: A) Time from randomisation to first EAC-confirmed MACE throughout the SELECT trial; and B) Estimated HRs and 95% CIs by day over the first 6 months post-randomisation



Data are from the in-trial period for the full analysis set. In panel A, cumulative incidence estimates are based on the time from randomisation to first EAC-confirmed MACE with non-CV death modelled as a competing risk using the Aalen–Johansen estimator. Patients without events of interest were censored at the end of their in-trial observation period. The x axis is truncated at 48 months because of the limited number of patients in the trial after 48 months. In panel B, estimated HRs and 95% CIs are shown as smoothed from day 10 to day 180 post-randomisation (period defined *post hoc* for data visualisation purposes). A two-sided significance level of 5% was used. No adjustments for multiplicity were performed. CI, confidence interval; CV, cardiovascular; EAC, event adjudication committee; HR, hazard ratio; MACE, major adverse cardiovascular events.

Fig. 1.

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Conclusion: In this secondary analysis of SELECT, nominal significance was observed within 3 months post-randomisation for MACE and within 6 months post-randomisation for death from CV causes and a HF composite. The efficacy estimates for MACE preceded any clinically meaningful changes in body weight, at a time when the semaglutide dose would not yet have been titrated to the targeted 2.4 mg. Semaglutide may rapidly improve disease trajectory in patients with overweight/obesity and CVD without diabetes. Further work addressing the mechanisms by which semaglutide produces these early clinical benefits would be of value.

AD15.05

Nutritional and lifestyle recommendations for the management of obesity with GLP-1 based therapies: An expert consensus statement using a modified Delphi approach

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Background: Obesity-management medications such as the glucagon-like peptide receptor 1 (GLP-1) receptor agonists (RA) semaglutide and liraglutide and the dual unimolecular GLP-1/glucose-dependent insulinotropic polypeptide (GIP) RA tirzepatide have transformed the management of obesity. However, challenges associated with dose-related gastrointestinal effects, obesity-associated nutritional insufficiencies, access and cost issues leading to poor adherence, may limit their long-term health benefits. Nutritional and lifestyle modifications are recognized as the cornerstone of obesity management but recommendations specific to people on GLP-1 based therapies (GBT) are lacking.
Methods: An international multidisciplinary panel consisting of clinicians and nutritionists employed a modified Delphi process to develop practical recommendations for nutritional and lifestyle strategies that may support people on GBT to optimise weight loss maintenance and health outcomes.
Results: A total of 52 consensus statements was developed, outlining key considerations for the practical management of obesity with GBTs, with a focus on nutritional factors in relation to obesity, physical activity, and the management of common gastrointestinal symptoms, nausea, vomiting, diarrhea, and constipation. The consensus statements include practical strategies supporting the weight loss journey, from before starting a GBT, during the weight loss and weight maintenance phases, and in case of GBT discontinuation. Key consensus statements include: 1) A non-judgmental, stigma-free environment is necessary when assessing a patient living with obesity. 2) Nutrition and lifestyle recommendations should be developed using a shared decision-making approach and be personalized to support a dietary approach that is safe, sustainable, realistic, and nutritionally adequate. 3) Exercise prescription must be individualized to the needs, preferences, capacity, and health status of each patient to sustain long-term adherence and prevent injuries. 4) A variety of dietary patterns can be used equally effectively for weight management, provided that they meet nutritional recommendations for protein, fat, micronutrient and fiber intake. 5) Nutritionally complete low-energy formula products can be used, either temporarily for weight-loss as a total or partial diet replacement. 6) In cases where the patient experiences nausea or vomiting, healthcare providers should monitor symptoms, adjust the GBT dose and try individualized dietary approaches to reduce or eliminate these symptoms. Proper hydration should be prioritized. 7) In cases where the patient experiences diarrhea, an individualized pharmacological and dietary approach along with adequate hydration should be implemented. 8) If GBT must be discontinued, the patient should be referred to a registered dietitian or registered nutritionist for continued nutritional support.
Conclusions: These expert consensus recommendations offer guidance for healthcare providers on nutritional and lifestyle strategies to support patients through their GBT weight loss journey.

AD15.06

Weight loss trajectories on tirzepatide treatment in people with prediabetes and overweight or obesity in SURMOUNT-1 3-year Study

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Introduction: In SURMOUNT-1 (SM-1) phase 3 trial of tirzepatide, a GIP/GLP-1 receptor agonist approved for obesity and T2D treatment, participants with overweight or obesity and prediabetes at baseline were included in a pre-specified 3-year blinded treatment period. This post hoc analysis assessed weight loss trajectories to better understand long-term weight reduction patterns and their durability with tirzepatide.
Methods: On-treatment data of participants from SURMOUNT-1 who were randomized to receive tirzepatide, treatment adherent (≥75% doses received) and had prediabetes at baseline were used in this analysis. Growth mixture models jointly modeling percent weight change trajectory and time to reach 20% weight reduction were used to classify participants into three groups. Weight trajectories of these groups over 3 years were evaluated and compared. Associations between participants' group and baseline characteristics as well as weight plateau outcomes were assessed. Weight plateau was defined as <5% weight change over 3 months after initial body weight reduction and over all subsequent 3-month intervals. Comparisons were based on Chi-square test or ANOVA.
Results: Across the total 700 participants included in this analysis, three patterns of weight loss trajectories (from baseline to week 176) were identified, forming three groups: Group 1 (n=248, 35.4%) with relatively steady early body weight reduction and early body weight plateau, Group 2 (n=226, 32.3%) with faster early body weight reduction and later body weight reduction plateau and Group 3 (n=226, 32.3%) with fastest body weight reduction and latest body weight reduction plateau (Fig. 1). Final

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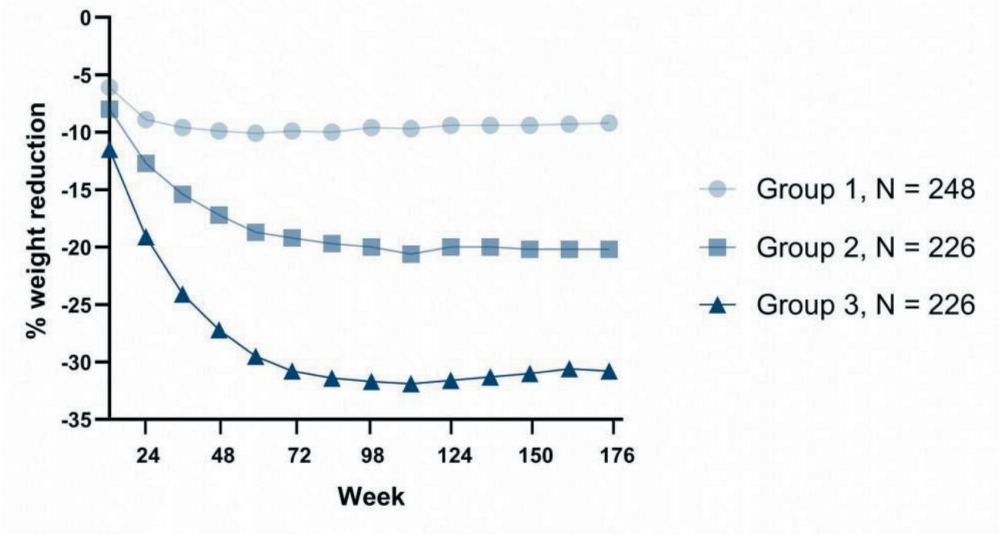


Fig. 1. % weight reduction by pattern group, over 176 weeks of the study.

mean body weight reductions for these groups were 9.2%, 20.2% and 30.8% respectively. Group 3 had the highest proportions of females and those with no obesity related comorbidities. The groups were comparable in mean age, duration of obesity, current smoker status and BMI.
By the end of treatment period, the percent reaching body weight plateau was significantly different ($p<0.05$) across the groups (Group 1: 87.1% (n=216), Group 2: 87.6% (n=198), Group 3: 81.4% (n=184)). Among those who reached body weight plateau by the end of the study, the majority of Group 1 and 2 participants reached body weight plateau by week 24 (74.5%, n=161 and 48.0%, n=95, respectively), when compared to participants in Group 3 (17.4%, n=32). The majority of participants in Group 3 reached body weight plateau starting at Week 36 or 48 (82.7%, n=152)
Conclusion: Based on the longest tirzepatide treatment data to date, three different patterns of weight loss trajectories were observed in people with prediabetes and obesity or overweight, using the data-driven statistical method of longitudinal pattern recognition. Most participants maintained clinically meaningful weight reduction over time. Baseline characteristics such as mean age, duration of obesity and BMI were similar across groups. These findings support further research on this topic as they may ultimately assist with shared decision-making when setting individual treatment goals.

Wednesday, 14 May 2025

AD16 - Deconvoluting Obesity: from Genes to Function

AD16.01

The Effects of Phosphodiesterase 4 Inhibitors on Weight Loss and Energy Homeostasis in Mice with Obesity Induced by a High-fat-diet

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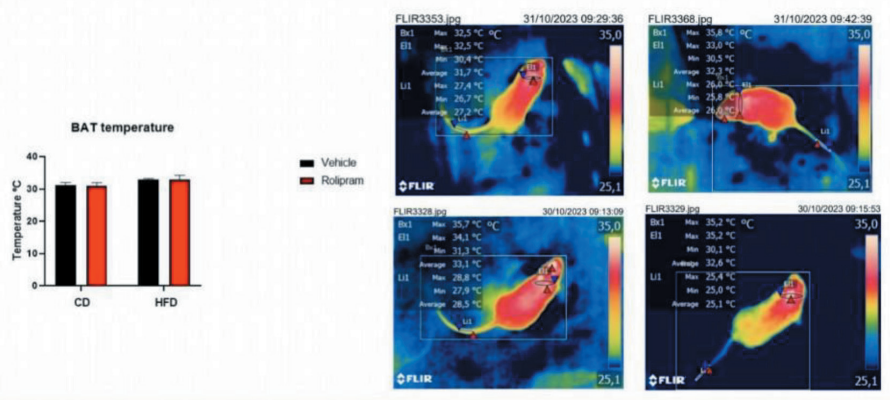
Introduction: Obesity is a worldwide health problem with an increasing incidence of comorbidities, such as type 2 diabetes. Leptin (Lep) resistance arises from obesity-related inflammation, enhancing the appetite. The expression of phosphodiesterase 4 enzyme (PDE4) is increased in inflammatory conditions. Rolipram (Rol) acts to inhibit PDE4 reducing adiposity and peripheral inflammation. Notwithstanding, the effects of Rol on Lep sensitivity and energy balance are still unknown.

Objective: To evaluate the effect of PDE4 inhibition on energy homeostasis and Lep resistance in mice with obesity induced by high-fat diet (HFD).
Methodology: Four-week-old male C57BL6 mice were fed a HFD (60%, Research Diets) or chow diet (C) for 10 weeks. In the 8th week, they received daily subcutaneous Rol injections (2mg/kg) or vehicle (V) and food intake and body weight were daily measured. Energy expenditure (EE) was measured on the 8th day of treatment using a metabolic cage (Oxymax). After treatment, fasted mice for 6h were subjected to glucose tolerance test (GTT (2g/kg, ip). On the last day of treatment, 90 minutes after the Rol or V injection, Lep (5mg/kg in 100ul, ip) or vehicle (saline) was injected, and weight and food intake were measured 14 and 24h later. Also, after treatment, body composition (NMR), brown adipose tissue (BAT) thermogenesis (FLIR) and catecholamine dosage in BAT and inguinal white adipose tissue (WAT) were assessed.
Results: 6-12 mice were analyzed in each group (chow + V, CV; chow + Rol, CR; HFD + V, HV; HFD + Rol, HR). There was a significant difference in body weight between HR and HV: absolute weight (HR 35+-4.18; HV 38.8+-3.88g; p 0.038) and weight variation (HR -2.26+-0.99; HV -0.19+-1.25g; p 0.002), but no difference between CR and CV (27.98+-2.25; 26.8 +- 2.22g). Rol effectively reduced ingestion in both diets (CR 42.85+-2.7; CV 48.13+-4.51g; p 0.03) (HR 24.75+-2.44; HV 28.31 +- 2.81g; p 0.01). In the HFD groups, compared to V, Rol increased VO2 (p 0.04) and energy expenditure (p 0.049) as well as the heat (p 0.03). There was no difference in VCO2 nor motor activity. Lep sensitivity was assessed in the HFD groups. As expected, there was no effect of leptin on body weight and food intake in the vehicle-treated group. However, remarkably, rolipram was able to revert this leptin resistance with a decrease of these parameters 14h and 24h after the Lep injection, compared to vehicle: food intake (14h p 0.024; 24h p 0.002) and body weight variation (14h p 0.003; 24h p 0.005). Fat mass was lower in the HR compared to HV group (p 0.03), with no difference in the lean mass. Rol increased the expression of catecholamines in BAT (p 0.026) and inguinal WAT (p 0.041) only in the HFD group. Rol was ineffective to improve FG/GTT in the HFD group. No difference in the BAT temperature was observed between groups.
Conclusion: Rolipram, a PDE4 inhibitor, effectively reduces the body weight of diet-induced obesity by reducing food intake, increasing basal energy expenditure and improving leptin sensitivity. PDE4 appears as a potential target to treat obesity.

Conflict of Interest: None Disclosed

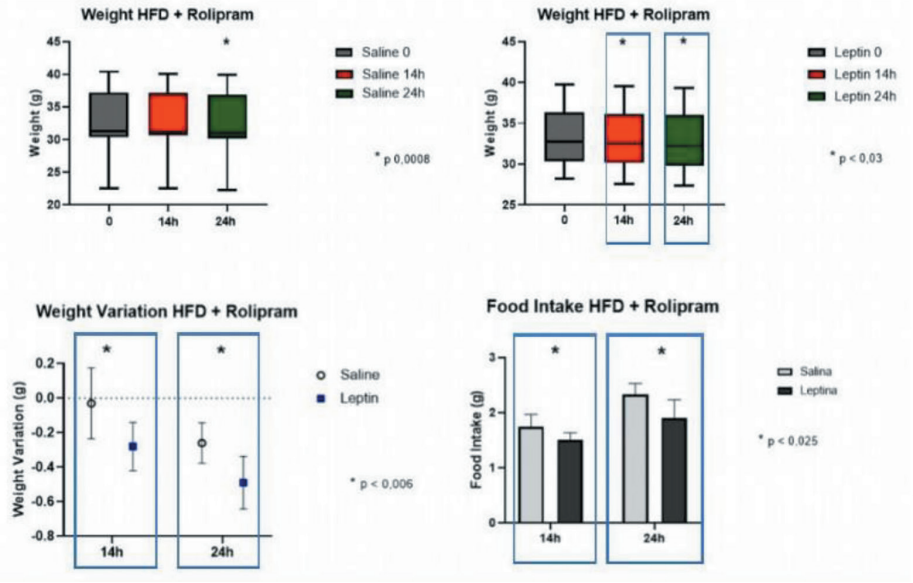
Funding: No funding to report

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Rolipram does not improve BAT temperature

Fig. 1. BAT temperature.



Rolipram reduces body weight and food intake 14h and 24h after the Lep injection.

Fig. 2. Body weight and food intake 14h and 24h after the Lep injection.

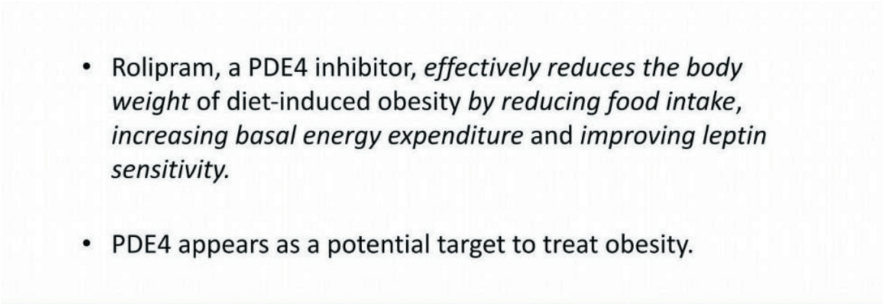
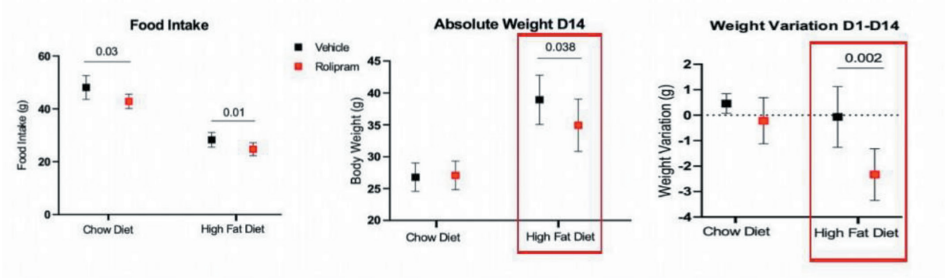


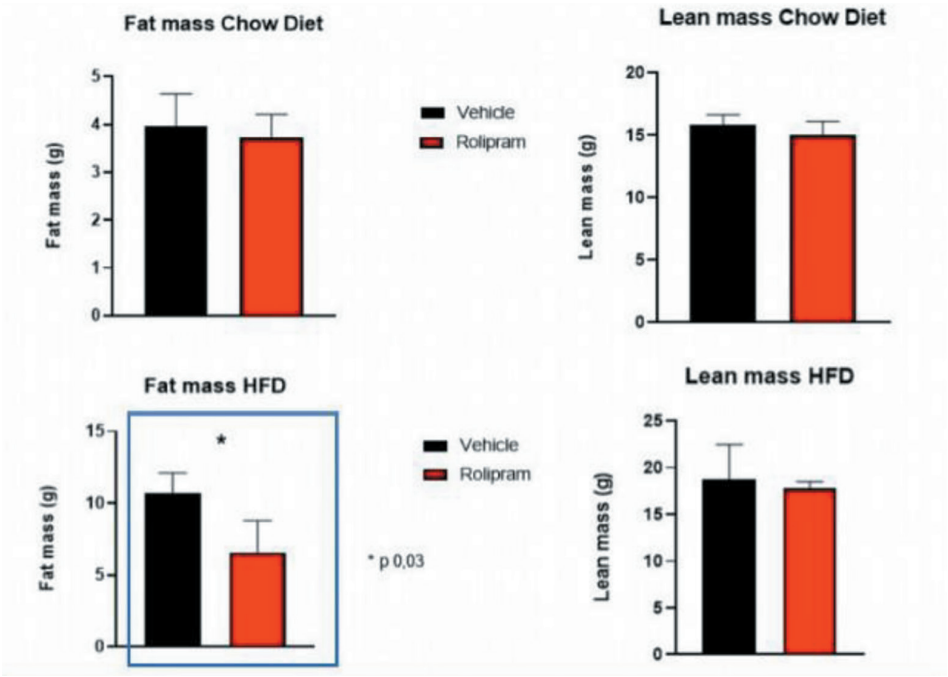
Fig. 3. Conclusion.

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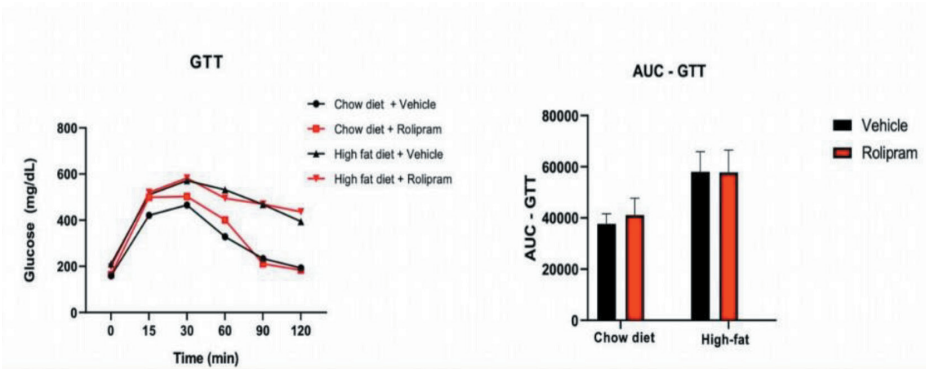
Rolipram reduces food intake and induces body weight loss in HFD group

Fig. 4. Effect on weight loss.



Rolipram reduces fat mass and preserve lean mass in HFD group

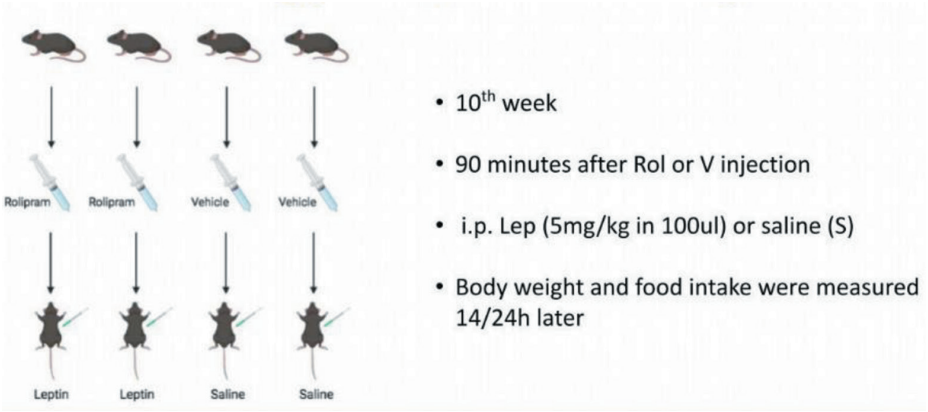
Fig. 5. Fat mass and preserve lean mass in HFD group.



Rolipram does not improve FG/GTT in both groups

Fig. 6. FG/GTT.

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Methodology – leptin sensitivity

Fig. 7. Leptin sensitivity.

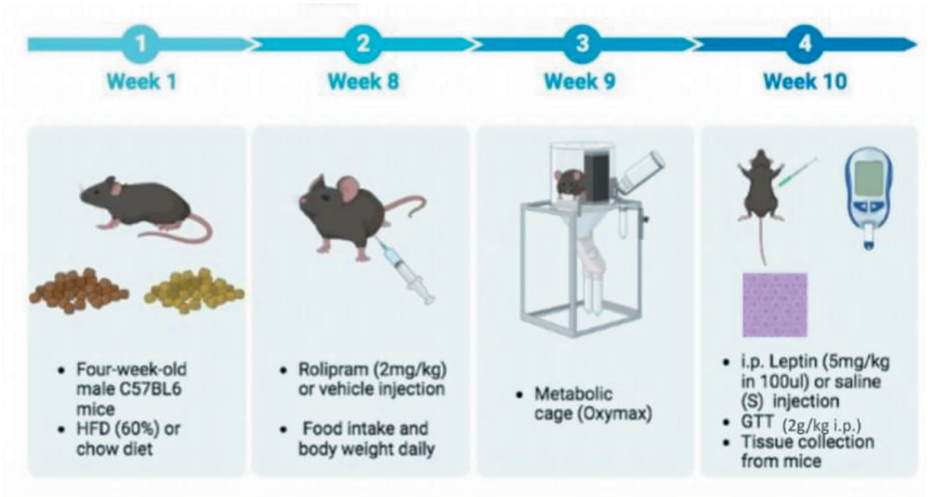


Fig. 8. Methodology.

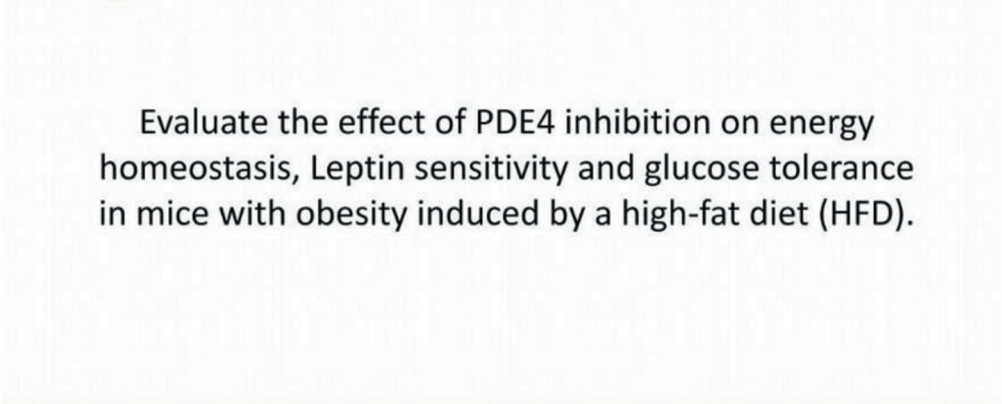
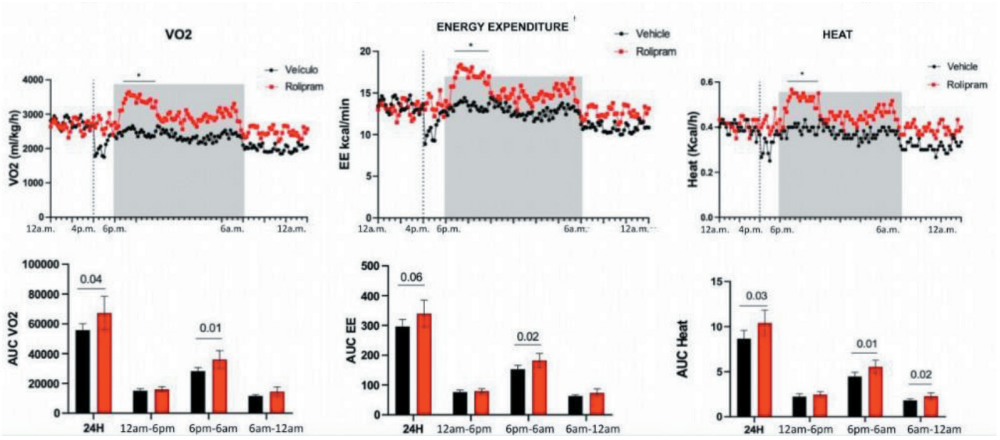


Fig. 9. Objective.

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Rolipram increases VO2, energy expenditure and heat in HFD group

Fig. 10. VO2, energy expenditure and heat in HFD group.

AD16.02

Olfr2 Deficiency Inhibits Metainflammation in Obesity

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Introduction: Adipose tissue macrophages (ATMs) are innate immune cells that regulate both inflammation and metabolism. In obesity, the expansion of ATM populations contributes to chronic low-grade inflammation, a key driver of metabolic dysfunction and systemic comorbidities. Recent studies highlight the heterogeneity of ATMs, revealing distinct subsets with unique signaling pathways and functions. Understanding which ATM subsets are responsible for obesity-induced inflammation is essential for developing precise therapeutic interventions. Notably, olfactory receptor 2 (Olfr2), an odorant receptor, has emerged as an inflammatory signaling mediator in macrophages. Activation of Olfr2 by the aldehyde octanal, in conjunction with TLR4 stimulation, triggered NLRP3 inflammasome-dependent secretion of IL-1β. Whether Olfr2 is expressed by ATMs and modulates their function in obesity is unknown.
Methods: Four-week-old male Olfr2-deficient (*Olfr2*$^{-/-}$) mice and littermate controls (*Olfr2*$^{+/+}$) were fed either a control-fat diet (CFD, 10% fat) or a high-fat diet (HFD, 60% fat) for 16 weeks. Body fat composition and physiological parameters were evaluated by micro-CT and metabolic cages. Glucose tolerance tests were performed to assess metabolic function. Epididymal adipose tissue (EAT) was analyzed by qRT-PCR and histology. The stromal vascular fraction was isolated from EAT for flow cytometry analysis. Serum leptin levels were quantified with ELISA.
Results: We identified Olfr2-expressing macrophages in EAT by flow cytometry and histology, which increased in obese mice. *Olfr2*$^{-/-}$ HFD-fed mice gained less body weight over the 16 weeks observation periods compared to *Olfr2*$^{+/+}$ HFD-fed mice. This was accompanied by significantly lower body fat, reduced EAT mass, and smaller EAT adipocytes, while lean body composition remained unchanged. Proinflammatory cytokine gene expressions (*Il1b*, *Il6*, *Tnfa*, and *Mcp1*) were significantly downregulated in the EAT of *Olfr2*$^{-/-}$ HFD-fed mice. Additionally, *Olfr2*$^{-/-}$ HFD-fed mice displayed improved glucose tolerance and decreased serum leptin level compared to *Olfr2*$^{+/+}$ HFD-fed mice. No differences were observed in physiological parameters such as respiratory exchange rate and energy expenditure between the two groups.
Conclusion: In this study, we identified expression of the odorant receptor Olfr2 on ATMs. Absence of Olfr2 resulted in reduced inflammation in EAT and improved glucose tolerance in obese mice. Genetic Olfr2 deficiency prevented body weight gain by reducing adipocyte hypertrophy, which in turn led to decreased leptin secretion. These findings highlight Olfr2^{+} ATMs as a promising therapeutic target for mitigating obesity-induced inflammation and its metabolic consequences.

Conflict of Interest: None Disclosed

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AD16.03

Hepatic p38δ as a regulator of liver rhythms against obesity- and social jetlag-induced steatosis

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Obesity is considered a serious health problem affecting 650 million people worldwide. One of the main obesity-related comorbidities is the non-alcoholic fatty liver disease (NAFLD). However, the molecular mechanism is poorly understood and finding new treatments is currently a challenge. Mitogen-activated protein kinases (MAPK) are involved in the development of metabolic diseases, but less is known about the role of the p38 MAPKS. In fact, preliminary results indicate that p38δ increases in human livers with steatosis correlating with fibrosis markers.
Firstly, we have found that mice lacking p38δ in hepatocytes (Albp38δKO) are protected from obesity-induced insulin resistance. Interestingly, while blood glucose is increased during the night, that peak was delayed in

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Albp38δKO mice, suggesting a circadian-dependent phenotype. The main source of glucose is glycogen, which levels were depleted in our mice. Another mechanism to alter blood glucose levels is by gluconeogenesis from lipids. In fact, Albp38δKO mice presented a diminished lipid accumulation in the liver, leading to a protection against high fat diet and jetlag associated steatosis. Analyzing the core mammalian circadian clock genes, we realized that Per2 is highly decreased at night, similarly to glucose levels. It was already known that Per2 promotes glycogen storage by inducing Gys2. Per2 can be modulated by phosphorylation regulating its stability. We observed that Albp38δKO mice presented an accumulation of Per2 in the nucleus, indicating a degradation in the cytoplasm that could explain the glycogen depletion.
Taken together, our data indicate that deletion of p38δ in hepatocytes might be beneficial in obesity and jetlag associated NAFLD by depleting the glycogen storage what leads to a reduced glucose levels and, therefore, de novo lipogenesis resources. We can therefore evaluate its potential use as a therapeutic target.

AD16.04

Hepatic OLFR734 inhibition disrupts liver function

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Introduction: One of the numerous molecules proposed to be involved in the pathophysiology of MAFLD is the recently discovered hormone asprosin, which is the endogenous ligand of the olfactory OLFR734 receptor. Specifically, was reported that genetic asprosin inhibition conditionally in adipose tissue or in the liver improve MAFLD symptomatology and hepatic gluconeogenesis in mice. Despite the implication of this hormone in MAFLD and in glucose metabolism few reports investigated the specific role of OLFR734 on liver function. The aim of this study is therefore to ascertain the impact of the specific hepatic ablation of OLFR734 in liver metabolism.

Methods: To achieve this objective, we perform a genetic inhibition by using a viral vector expressing an shRNA to specifically inhibit this olfactory receptor in the liver of mice fed standard or high fat diet. We then study the progression of MAFLD in mice fed high fat diet and the underlying molecular pathway. Besides this we study the glucose metabolism under different experimental scenarios of hypoglycaemia such as fasting or calorie restriction and after refeeding in previous fasted mice to study the postprandrial glucose production all of that in mice fed standard diet. Finally, analysis of liver biopsies from patients with obesity (body mass index>35 kg m−2) and with or without T2DM were obtained.
Results: In this study we found that hepatic OLFR734 levels varies accordingly to changes in nutritional status and its knock down in the liver increase hepatic lipid content in mice fed high fat diet through the SIRT1/ER stress signaling pathway. Also, our results shown that OLFR734 expression is involved in the adaptation of glucose production to nutrient availability and that the hepatic human OLFR734 ortholog named OR4M1 is expressed significatively at higher levels in male patients with T2DM.
Conclusions: This study therefore applies an original and unconventional approach on understanding asprosin signalling and increase the knowledge of the mechanisms by which modulation of OLF734 expression affect liver function

AD16.05

Multiethnic prevalence of rare deleterious mutations in eight monogenic obesity genes and their association with body mass index

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Background: No study has investigated the prevalence and association with body mass index (BMI) of rare deleterious mutations in the eight (*ADCY3*, *LEP*, *LEPR*, *MC3R*, *MC4R*, *MRAP2*, *PCSK1*, *POMC*) well-established monogenic obesity genes from the leptin-melanocortin pathway in large multiethnic populations.

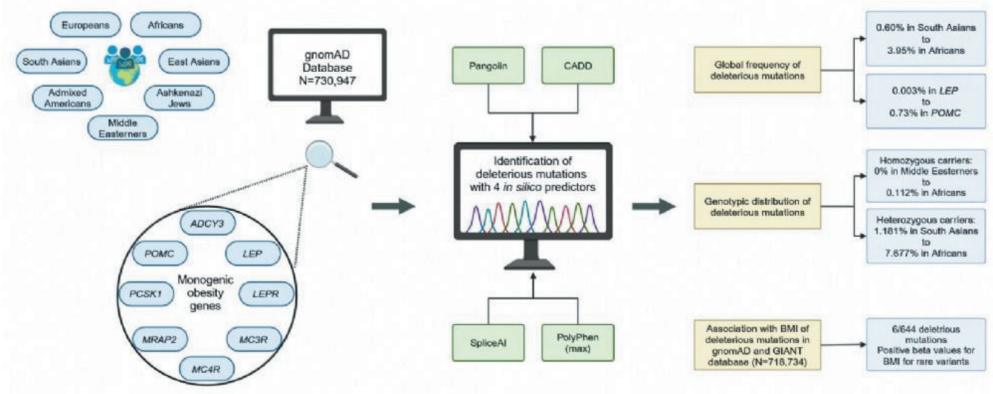


Fig. 1. Graphical abstract.

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Methods: We assessed the prevalence, genotypic distribution and association with BMI of deleterious mutations in these genes in two multiethnic populations. Loss-of-function (nonsense, start loss, splice acceptor, splice donor and frameshift) and *in silico* predicted deleterious missense mutations were identified in 730,947 individuals from seven ethnic groups (Europeans, Admixed Americans, South Asians, East Asians, Africans, Middle Easterners and Ashkenazi Jews) in the gnomAD database. Their association with BMI was investigated in 718,734 individuals from five ethnic groups (Europeans, Hispanic Americans, South Asians, East Asians and African Americans) in the GIANT exome chip consortium.
Results: *POMC* displayed the highest (0.73%) and *LEP* the lowest (0.003%) prevalence of deleterious mutations, respectively. Ethnic distribution aligns with the ethnic-specific propensity for obesity observed worldwide: East- and South-Asians are at low-risk (0.60% and 1.07%), Ashkenazi Jews and Europeans are at medium-risk (1.07% and 1.28%), Admixed and African Americans are at high-risk (2.12% and 3.95%). Homozygous carriers of deleterious mutations were scarce, ranging from 0% in Middle Easterners to 0.112% in Africans. Six out of 644 deleterious mutations from gnomAD were found in GIANT, with positive beta values for BMI increase for all the rare variants (Pbinomial= 0.02).
Conclusion: The important (6.58-fold) differences in the prevalence of monogenic obesity mutations among ethnic groups are driven by multiple ethnic-specific or -nonspecific rare mutations. Our findings have important implications in the context of large-scale genetic testing and the prescription of personalized treatments in the context of monogenic obesity.

AD16.06

Downregulation of Acyl-CoA-binding protein (ACBP) in brown adipose tissue protects mice against diet-induced obesity

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Introduction: Acyl-CoA Binding Protein (ACBP), also known as Diazepam Binding Inhibitor (DBI), is a multifunctional protein acting inside cells and also as a secreted protein. It is involved in multiple biological processes, such as lipid metabolism and brain function. Our previous studies revealed that ACBP expression in brown adipose tissue (BAT) is repressed under enhanced thermogenesis (e.g., cold exposure) and upregulated during BAT inactivation (e.g., warm environments). Considering the critical role of BAT in obesity protection, we investigated whether ACBP in BAT contributes to obesogenesis.
Methods: We generated mice lacking ACBP expression specifically at BAT (Acbp BAT-KO) by mating floxed ACBP mice (also used as controls) and UCP1-Cre mice (B6.FVB-Tg(Ucp1-cre)1Evdr/J, Jackson Lab, USA). The resulting mice showed strong reduction of ACBP expression (10% remnant expression) only in BAT. Mice were fed a high-fat diet for three months (HFD, 45% Kcal fat, Envigo, USA). VO2 consumption and VCO2 production were measured in Labmaster metabolic cages (TSE, Germany). Plasma metabolites, insulin and GTT were determined by standard procedures. RNA was extracted from BAT and RNAseq analysis was performed in collaboration with CNAG (Barcelona, Spain).
Results: Under HFD, mice lacking ACBP expression in BAT had significantly reduced body weight gain. That happened without any change in food intake. In comparison with HFD-fed controls, HFD-fed ACBP BAT-KO mice showed significantly higher energy expenditure. The metabolic status of HFD-fed ACBP-BAT-KO mice was healthier than HFD-fed controls (reduced glycemia, insulinemia and HOMA-IR, and improved glucose tolerance). ACBP BAT-KO mice had a decreased lipid droplet size of brown adipocytes. Given this improved metabolism parameters, we analysed the BAT transcriptome in HFD-fed Acbp BAT-KO mice and we identified 293 upregulated and 329 downregulated transcripts relative to controls. According to GO annotation-based analysis, upregulated genes corresponded to "adaptive thermogenesis", "fat cell differentiation" and "fatty acid metabolism". STRING-based analysis of the upregulated genes identified predominant impacts on "response to heat" and "lipid metabolic processes". The analysis of downregulated genes in HFD-fed ACBP BAT-KO mice identified impacts on "lipid response", signalling networks involving FGFs and intracellular kinases, "extracellular matrix", and "cell adhesion". In BAT from HFD-fed ACBP BAT-KO mice, several genes related to BAT activation (Ppargc1a, Dio2, Nrg4) clustered as upregulated, but only the induction of the BAT activity-associated genes Nr4a3, Zbtb16, Per2 and Elovl3 was statistically significant.
Conclusion: BAT-specific reduction of ACBP expression protects against diet-induced obesity in mice. This suggests that ACBP acts as repressor of BAT thermogenic activity and subsequently of adaptive energy expenditure. ACBP is identified as a potential target to be down-regulated to control obesogenesis and associated metabolic pathologies.

Conflict of Interest: None

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AD17 - Opportunites for Prevention in Childhood Obesity

AD17.01

Adolescent social networks and energy-balance-related behaviors: a sociocentric study

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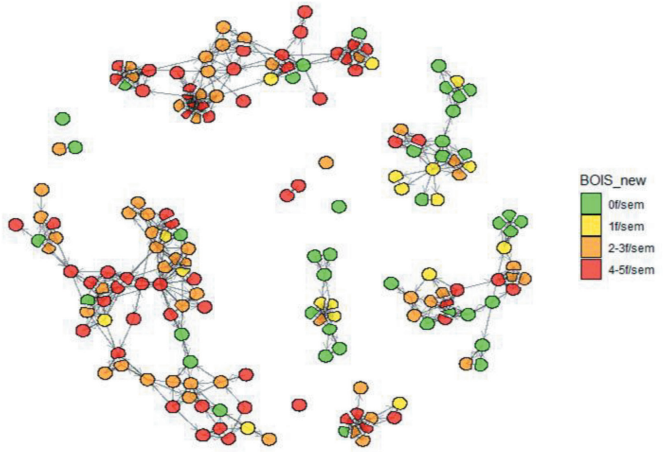
Introduction: Social networks significantly shape health behaviors and outcomes. Individuals often form friendships and social connections with those who share similar attributes or characteristics, a phenomenon known as homophily. Over time, these networks can foster social contagion, influencing behaviors across groups. However, few studies have examined the relationship between social networks and energy-balance-related behaviors (EBRBs) in adolescents. This study aims to analyze whether negative EBRBs—such as sugar-sweetened soda consumption, fast-food intake, low physical activity, and high sedentary behavior—cluster among adolescent friendships.
Methods: A total of 212 adolescents (aged 12–13) from three schools in southeastern France participated in this study, with an informed individual and parental consent rate of 73%. Schools were randomly selected to reflect the socioeconomic diversity of the region. Under the supervision of a teacher and a researcher, participants completed a concise online questionnaire assessing height, weight, physical activity, sedentary behavior, sleep, and diet. Adolescents also reported their school friends (defined as those with whom they spent the most time). Exponential Random Graph Models (ERGMs) employing a Markov Chain Monte Carlo approach were used to assess whether friendship ties were associated with similarity in EBRBs, adjusting for gender, socioeconomic status, and classroom affiliation. Log-odds estimates from ERGMs were transformed into probabilities using the logistic function.
Results: Adolescent friendships were primarily structured by classroom and gender. The ERGM estimated a 99% probability that two adolescents of the same gender were friends (95% CI: 99%–99%) and a 95% probability

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for those in the same classroom (95% CI: 94%–96%). Regarding dietary patterns (Figure 1), adolescents who reported never consuming sugar-sweetened sodas had a 69% chance of being friends (95% CI: 57%–79%), while those consuming sugar-sweetened sodas 4–5 times per week had a 61% chance of being friends (95% CI: 50%–71%). No significant results were observed for intermediate consumption frequencies (1–3 times per week).

For fast-food consumption, adolescents with lower frequencies of consumption were more likely to be friends (never: 61%, once a week: 65%), whereas higher frequencies (more than three times per week) were not associated with friendship ties (1%). Similar statistically significant associations were observed for physical activity and sedentary behaviors.

Conclusion: Energy-balance-related behaviors tend to cluster within adolescent friendship networks, even after adjusting for gender, socioeconomic status, and classroom affiliation. These findings highlight that adolescent health behaviors are strongly embedded within their social networks. Public health initiatives should consider these social dynamics to avoid stigmatizing behaviors and to leverage collective strategies that promote positive health behavior changes.



BOIS_new: Sugar-sweeneted sodas consumption variable 0f/sem: Never 1f/sem: Once a week 2-3f/sem: Two to three times a week 4-5f/sem: Four to five times a week

Fig. 1. Adolescent social network and sugar-sweetened sodas consumption.

AD17.02

Impacts of EAT-Lancet Dietary Patterns in Environmental Indicators and Prevented Cases of Obesity in Children and Adolescents

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[3]EPIUnit ITR, Instituto de Saúde Pública da Universidade do Porto, Universidade do Porto, (EPIUnit ITR, Institute of Public Health of the University Porto, University of Porto), Faculdade de Medicina da Universidade do Porto (Faculty of Medicine, University of Porto)

Introduction: The challenges of addressing childhood and adolescent obesity alongside mitigating the environmental impacts of food systems in paediatric populations are increasingly recognized, yet remain underexplored in the literature, emphasizing the need for research into sustainable and health-promoting dietary patterns. This study aimed to simulate realistic dietary scenarios aligned with the EAT-Lancet dietary recommendations and evaluate their impact on diet-related greenhouse gas emissions (GHGE), land use (LU), and the obesity status of children and adolescents.

Methods: Dietary intake of children (3-9y) and adolescents (10-17y) from the last National Food, Nutrition, and Physical Activity Survey, Portugal (n=1153), was assessed using food diaries (children) and 24-h recalls (adolescents) and an automated multiple-pass method with portion size estimations. The World Index Sustainability and Health (WISH), adapted to paediatric age, measured adherence to the EAT-Lancet dietary recommendations. Diet-related GHGE and LU were estimated using the SHARP-Indicators database. BMI (measured) z-scores were classified according to WHO criteria. Dietary patterns (DP) were done using latent class analysis. Simulations aligned current dietary intake with the EAT-Lancet recommendations. The potential to prevent obesity cases was estimated by calculating Potential Impact Fractions (PIF).

Results: In children, reducing the consumption of eggs, meats, fish, and soft drinks towards the "Less Meat, Fish and Soft Drinks" DP significantly improved the WISH scores and decreased diet-related GHGE and LU. In adolescents, reducing dairy and red meat towards other animal-protein foods achieved the greatest GHGE and LU reductions (from 4.5 kg CO2eq/day and 4.1 m2/year observed to 3.4 kg CO2eq/day and 3.0 m2/year simulated, respectively $p<0.001$), with stable WISH scores. The scenario that yielded the most significant reduction in obesity cases involved a shift towards a plant-based DP (PIF=0.7% children, 0.2% adolescents), but it also increased environmental indicators.

Conclusions: Transitioning to a plant-based DP showed the greatest potential to decrease obesity cases in both age groups. However, this shift also increased certain environmental indicators, suggesting a trade-off between improved health outcomes and environmental impact.

AD17.03

Neighborhood Green Spaces and Pediatric Obesity: Exploring the Impact During the COVID-19 Pandemic

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Introduction: Childhood obesity remains a global public health issue, with significant health and socioeconomic consequences. Mediterranean countries, including Spain, exhibit some of the highest prevalence rates in Europe. In the Balearic Islands, the prevalence of obesity among school-aged children increased from 9.3% in 2004–2005 to 10.4% in 2016–2017. The COVID-19 pandemic further disrupted children's routines, increasing sedentary behavior and stress levels, potentially accelerating weight gain. Green spaces are known to promote physical activity and reduce stress, but evidence on their protective effects during the pandemic remains limited, especially in low socioeconomic status (SES) areas. This study investigates the association between neighborhood green spaces and childhood obesity before and during the pandemic, with a focus on SES differences.

Methods: Using electronic health records from the Balearic Islands (e-SIAP), we created a retrospective cohort of 40,956 children aged 2–7 years. Participants were followed from 2013 to 2022, categorized into pre-pandemic (2013–2017), pandemic (2018–2022), and overall (2013–2022) cohorts. Obesity was classified using WHO z-score thresholds. Green space exposure was estimated using the normalized difference vegetation index (NDVI) at the census tract level. Cox proportional hazards models assessed the association between green space exposure and obesity risk, adjusted for age, sex, nationality, SES, and urbanicity. Analyses were stratified by SES and urban settings to explore variations.

Results: Higher NDVI exposure was consistently associated with a lower obesity risk across all periods. During the pandemic, an interquartile increase in NDVI exposure reduced the hazard ratio (HR) for obesity onset to 0.846 (95% CI: 0.758–0.943). Similar protective effects were observed in the pre-pandemic (HR: 0.748, 95% CI: 0.649–0.863)

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and overall (HR: 0.802, 95% CI: 0.746–0.862) periods. Children in low-SES areas exhibited stronger protective effects of green space exposure pre-pandemic but showed diminished benefits during the pandemic. Urban settings displayed more robust protective associations compared to non-urban areas.
Conclusions: Findings suggest neighborhood green spaces may play a protective role against pediatric obesity, though the magnitude of this effect varied by SES and urbanicity. Policymakers should prioritize equitable access to green spaces, particularly in socioeconomically disadvantaged communities, to mitigate the impacts of pandemics and promote long-term public health.

AD17.04

Urban-rural differences and associations between early childhood movement behaviours and adiposity indicators

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Introduction: Childhood overweight and obesity are major global health concerns, with movement behaviours—insufficient physical activity, excessive sedentary behaviour and poor sleep—being potential risk factors. However, evidence on their associations with adiposity in young children is somewhat inconsistent and primarily focused on body mass index (BMI). Additionally, the effects of urbanization on movement behaviours and adiposity in young children remain poorly understood. This study aimed to examine urban-rural differences in early childhood movement behaviours (physical activity, sedentary time and sleep) and adiposity indicators (BMI and waist to height ratio [WHtR]), and their associations in both settings.
Methods: Our cross-sectional data consisted of 1080 3–4-year-old children (46% girls) from the SUNRISE Finland study collected in urban (57%) and rural (43%) areas in 2022–2023. Areas were identified using the urban-rural classification by the Finnish Environment Institute. Children wore an ActiGraph accelerometer on their waist for 7 days to assess moderate- to vigorous-intensity physical activity (MVPA), sedentary time and sleep, and parents reported child's screen time and household education level. Height, weight and waist circumference were measured to calculate the WHO's BMI z-score and weight categories, and WHtR. We combined the BMI categories of possible risk of overweight, overweight and obesity (=risk of overweight), and WHtR ≥ 0.55 indicated central obesity. Logistic regression analyses were performed adjusting for age, sex and household education.
Results: Compared to urban children, a higher proportion of rural children were at risk of overweight (23% vs. 34%, p<0,001) or categorized as having central obesity (13% vs. 18%, p=0,037). In addition, rural children had more screen time (p<0.001) and their caregivers had lower education (p<0.001). In urban areas, more MVPA was associated with a higher risk of overweight (p=0.010). In rural areas, more screen time (p=0.029) and less sleep (p=0.008) were associated with a higher risk of overweight, and more screen time (p=0.015) and sedentary time (p=0.017) and less sleep (p=0.003) with central obesity. These results were adjusted for age, sex and education, and were consistent when adjusted only for age and sex.
Conclusion: A higher proportion of rural children were at risk of overweight, met the criteria for central obesity, and had more screen time compared to urban children. In urban areas, higher MVPA was associated with an increased risk of overweight (BMI) but not with central obesity (WHtR). This may reflect WHtR being a better indicator of adiposity, whereas BMI can be influenced by muscle mass, which tends to increase with higher MVPA. Only in rural areas, more screen time, sedentary time and less sleep were associated with adiposity indicators. The findings highlight distinct movement behaviour patterns and risk factors for early childhood adiposity in urban and rural settings, suggesting that one-size-fits-all strategies may not be effective.

AD17.05

Childhood obesity trajectories, obesity episodes, and adolescent mental health: A UK cohort study

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Background: Current evidence indicates that living with obesity in childhood may have long-term implications for mental health. However, there is limited evidence on how changes in obesity weight status category from childhood to adolescence are associated with adolescent mental health. This study examined the associations between childhood obesity trajectories, obesity episodes, and adolescent mental health.
Methods: We analysed data from a nationally representative birth cohort study of UK children, the Millennium Cohort Study. Four trajectory groups of obesity were identified using data from ages 7 and 17 (n = 8,306): never developing obesity (living with no obesity at ages 7 and 17), obesity development (living with no obesity at age 7 but with obesity at age 17), persistence (living with obesity in both ages 7 and 17), and reversal (living with obesity at age 7 but not at age 17). Previous obesity episodes (number of sweeps living with obesity) were assessed at ages 7, 11, and 14 (n = 7,246). Caregiver and self-reported internalising and externalising symptoms at age 17 defined adolescent mental health. Linear regression models, adjusted for sociodemographic covariates, were used to assess the associations between obesity trajectories, obesity episodes, and adolescent mental health. Worsening mental health (i.e., increase in scores for internalising or externalising symptoms) was examined by controlling for baseline symptoms at age 7.
Results: Relative to a trajectory of never developing obesity, obesity development (β = 1.01; 95% CI = 0.71, 1.32) and persistence (β = 1.18; 95% CI = 0.74, 1.61) were associated with higher internalising symptoms at age 17 and worsening of these symptoms between ages 7 and 17 (β = 0.87; 95% CI = 0.57, 1.17 and β = 0.86; 95% CI = 0.56, 1.26 for obesity development and persistence, respectively). Obesity development was also associated with higher externalising symptoms at age 17 (β = 0.52; 95% CI = 0.25, 0.80) and worsening of these symptoms over time (β = 0.30; 95% CI = 0.07, 0.53). No differences in adolescent mental health (both internalising and externalising symptoms) were observed between children who reversed vs. never developed obesity by age 17. In addition, having multiple past obesity episodes (vs. never developing obesity) was not associated with worse adolescent mental health independent of weight status at age 17.
Conclusions: Obesity development and persistence from ages 7 to 17 are associated with worse adolescent mental health. If childhood obesity is reversed at age 17, there appears to be no evidence of an association between previous obesity and mental health at age 17. These findings suggest that the extent to which childhood obesity is associated with long-term worse adolescent mental health may be largely dependent on whether obesity persists over time or develops in adolescence.

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AD17.06

Movement Behaviors and Psychosocial Well-Being in Children and Adolescents: The IDEFICS/IFamily studies

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Introduction: Understanding the relationship between adherence to movement behavior guidelines (encompassing physical activity, screen time and sleep) and psychosocial well-being is essential for promoting mental health in youth, particularly those at higher risk of obesity. Hence, we aim to examine the association between adherence to movement behavior guidelines and psychosocial well-being in the European IDEFICS/IFamily cohort, and to examine whether obesity outcomes and sex may moderate this association.
Methods: The IDEFICS/IFamily is a school-based multicenter pan-European cohort of children followed for 6 years. This study included 7,359 observations from children aged 2–16 years across three time points: IDEFICS wave 1 (n=2,258) in 2007/08 and the 2009/10 wave 2 (n=2,707), as well as the IFamily wave 3 in 2013/14 (n=2,394). Psychosocial well-being, screen time, and sleep duration were parent- or self-reported (for children ≥12 years). Physical activity was objectively measured using accelerometers. A composite movement behavior score was constructed based on adherence to the Canadian 24-Hour Movement Guidelines, which include recommendations for physical activity, screen time, and sleep duration. Obesity outcomes, z-score body mass index (z-BMI) and z-score waist circumference (z-WC), were assessed at each time point. Associations between the movement behavior score and psychosocial well-being were analyzed longitudinally using generalized linear mixed models with up to three repeated measurements per participant, adjusting for lifestyle and socioeconomic confounders. Interaction analyses were conducted to evaluate whether obesity outcomes and sex moderated these associations.
Results: Higher adherence to the movement behavior score was positively associated with psychosocial well-being (β=0.47, 95%CI: 0.42, 0.52), with stronger effects in males compared to females. Stratified analyses showed positive associations across all weight categories, larger effects in participants with overweight/obesity (β=0.64, 95%CI: 0.55, 0.73) than those with underweight/normal weight (β=0.39, 95%CI: 0.33, 0.45). Interaction analyses identified that z-WC moderated the association between movement behaviors and psychosocial well-being in females (β=0.31, 95%CI: 0.05, 0.57), but this effect was attenuated after adjusting for parental education and dietary factors (β=0.21, 95%CI: -0.07, 0.49).
Conclusion: Adherence to movement behavior guidelines were positively associated with psychosocial well-being, especially in individuals with overweight or obesity. These findings highlight the importance of promoting healthier movement behaviors to improve mental health, particularly among at-risk populations. Further research is needed to explore the moderating role of obesity outcomes and to develop region-specific guidelines for European youth.

Conflicts of interest: None

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Monday, 12 May 2025

PO1 - BASIC SCIENCE

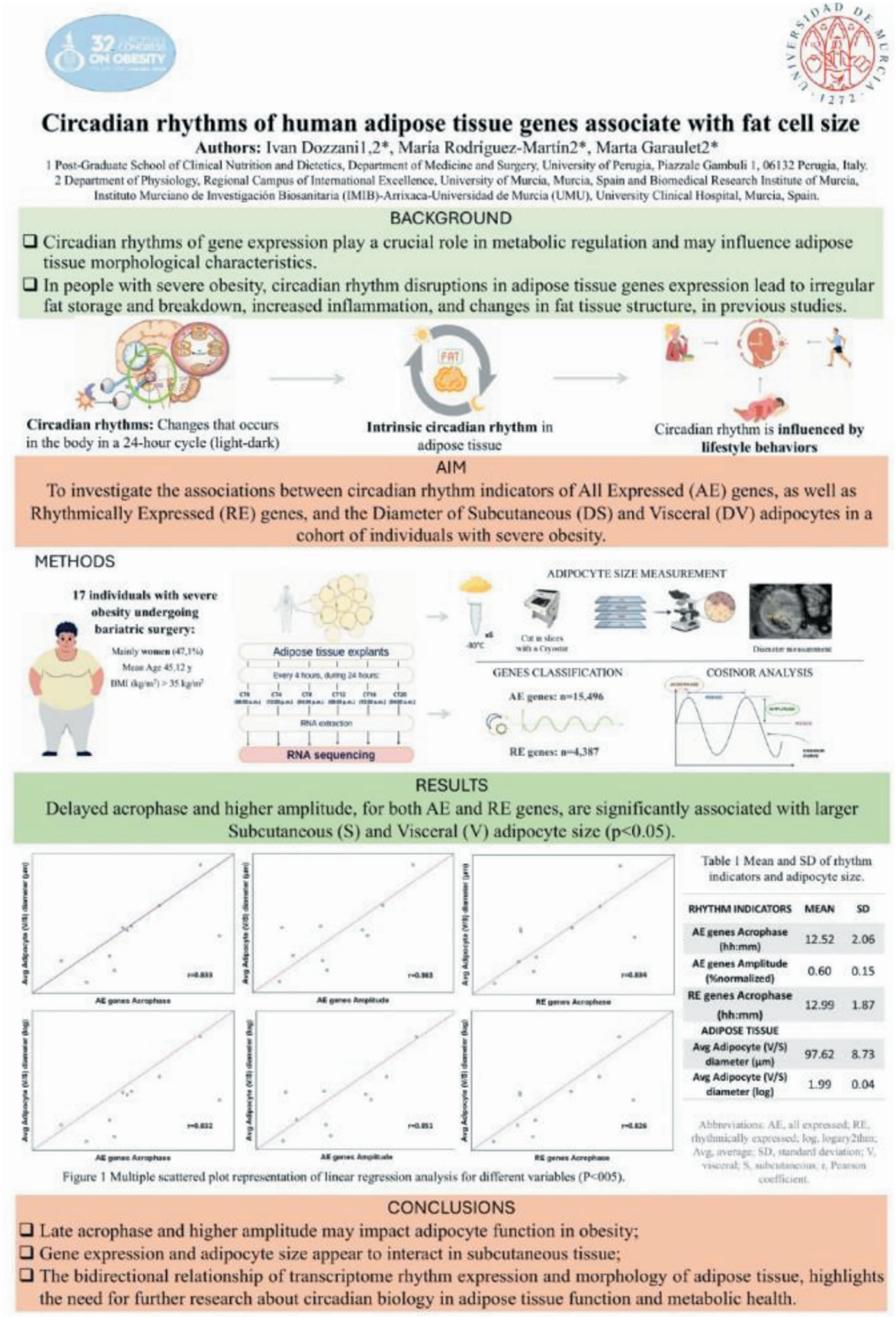
PO1.001

Rhythms of gene expression in adipose tissue are linked to adipocyte size and metabolic health

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Introduction: Circadian rhythms in gene expression play a fundamental role in regulating metabolic processes and may influence adipose tissue characteristics in individuals with severe obesity. This study aims to a) investigate the association between circadian metrics of gene expression and the size of subcutaneous and visceral adipocytes, and b) explore potential links between these circadian parameters and markers of metabolic health. Specifically, we analyzed mean acrophase and amplitude across all expressed genes, as well as a subset of 4,387 rhythmically expressed genes, in a cohort of individuals affected by severe obesity undergoing gastric bypass.
Methods: Abdominal adipose tissue explants from participants with obesity (n=17) were cultured for 24-h duration and analyzed every 4 h (six time points) to assess gene expression, with levels normalized to the median for each individual. Circadian analyses were conducted using the cosinor method to calculate amplitude (distance from mesor to peak) and acrophase (timing of the peak relative to the mesor). Mean values were determined for all expressed genes (acrophase: 12.52 ± 2.06 hours; amplitude: 0.60 ± 0.15) and rhythmically expressed genes (acrophase: 12.99 ± 1.87 hours; amplitude: 0.49 ± 0.12). Associations between these circadian metrics, adipocyte size (subcutaneous and visceral), and metabolic health markers were evaluated.
Results: Our analysis revealed that for all expressed genes, each hour of delayed acrophase was associated with a 3.01-unit increase in the diameter of both subcutaneous and visceral adipocytes (Beta = 3.01, P = 0.05) and a 0.017-unit increase in the log-transformed diameter of subcutaneous adipocytes (P < 0.05). Similarly, gene expression amplitude was



Graphical representation of the abstract presented.

Fig. 1. Graphical abstract.

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positively correlated with adipocyte size (0.61 units, P < 0.05) and diameter (0.18 units, P < 0.05). For rhythmically expressed genes, delayed acrophase was linked to a 3.6-unit increase in adipocyte size (P = 0.05), while amplitude showed a trend toward association with subcutaneous adipocyte diameter (P = 0.070). No significant associations were observed between circadian metrics and markers of metabolic syndrome, although a trend was noted with diastolic blood pressure.

Conclusion: Our findings underscore that circadian indicators of gene expression, specifically acrophase and amplitude, are linked to adipocyte size, with a notable impact on subcutaneous fat. These results suggest that the timing and intensity of gene expression rhythms in adipose tissue may play a role in shaping adipocyte morphology, with potential implications for metabolic health. Further studies are warranted to determine whether targeting circadian gene expression could offer strategies to address obesity-related metabolic dysfunction.

PO1.002

Kiss1 neuron-Bdnf exerts a sexual dimorphic function controlling sexual development in female and energy balance in male mice

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Brain-derived-neurotrophic factor (BDNF) is a member of the neurotrophins family, and it is essential in neuronal survival and differentiation, and synaptic plasticity and neurotransmission in the brain. In addition, BDNF controls energy balance regulating food intake and energy

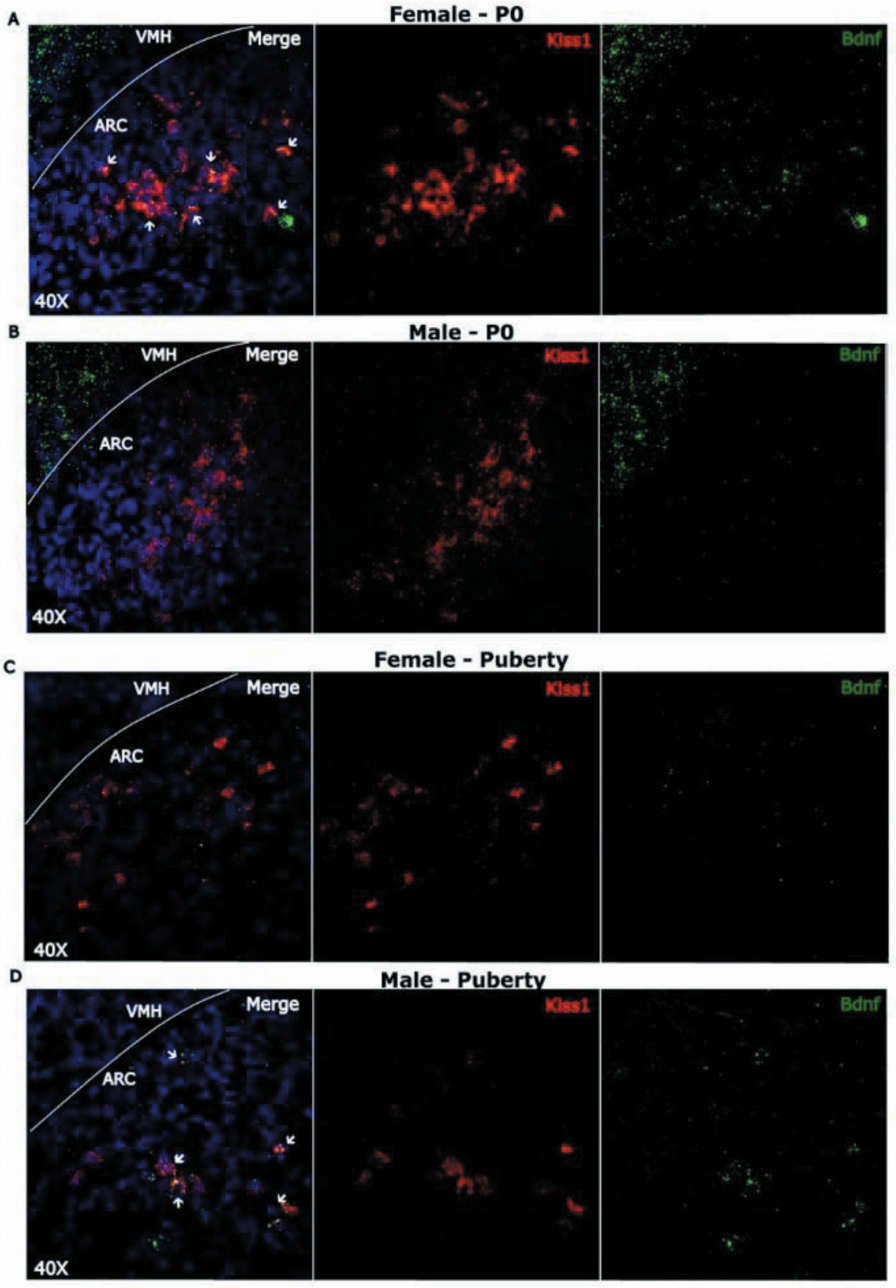


Fig. 1. Expression of BDNF mRNA in Kiss1 neurons during different stages of female and male mice life.

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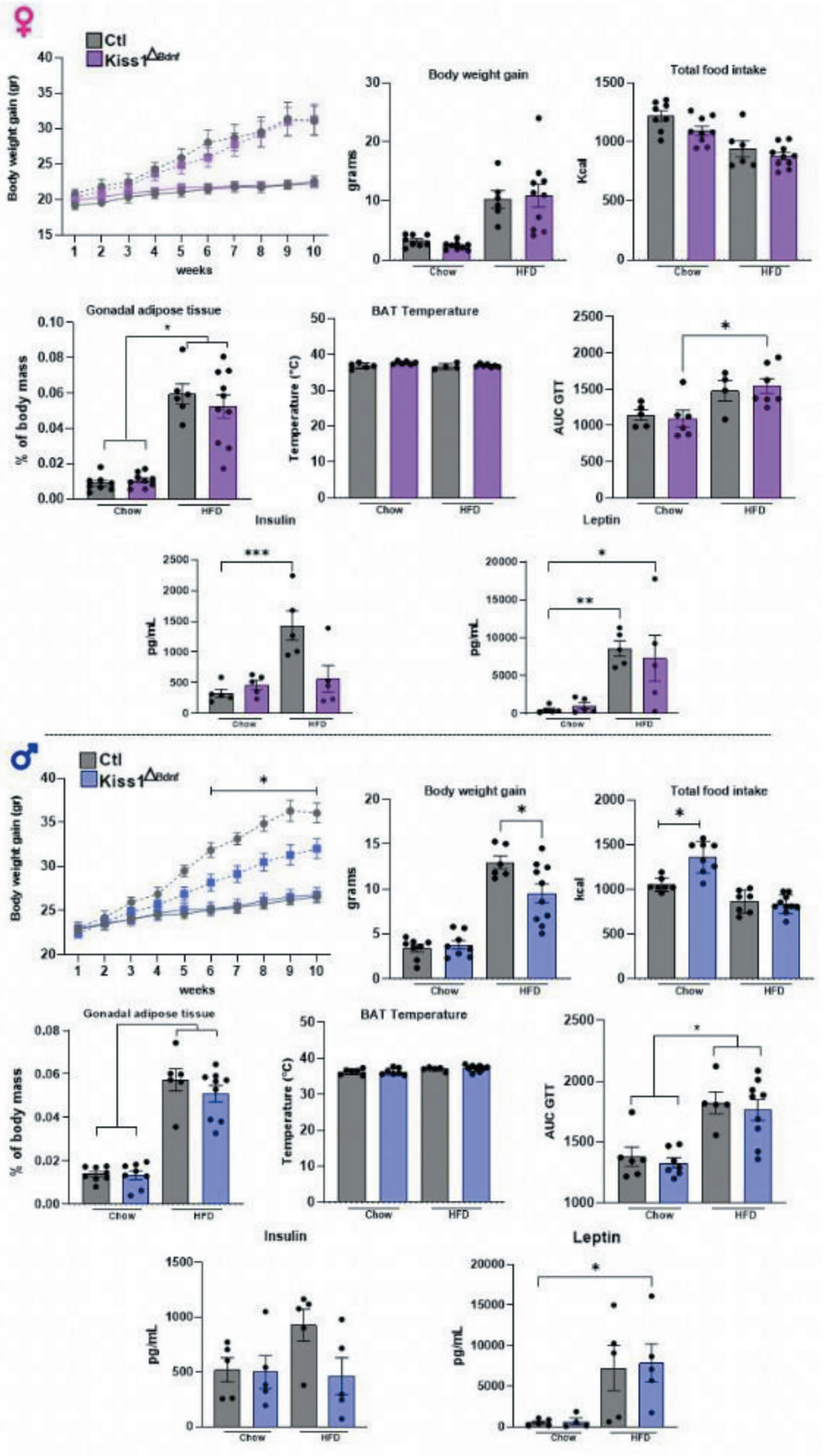


Fig. 2. Metabolic characterization in male and female mice lacking BDNF in Kiss1 neurons upon high-fat diet feeding.

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Fig. 3. Mice model generation.

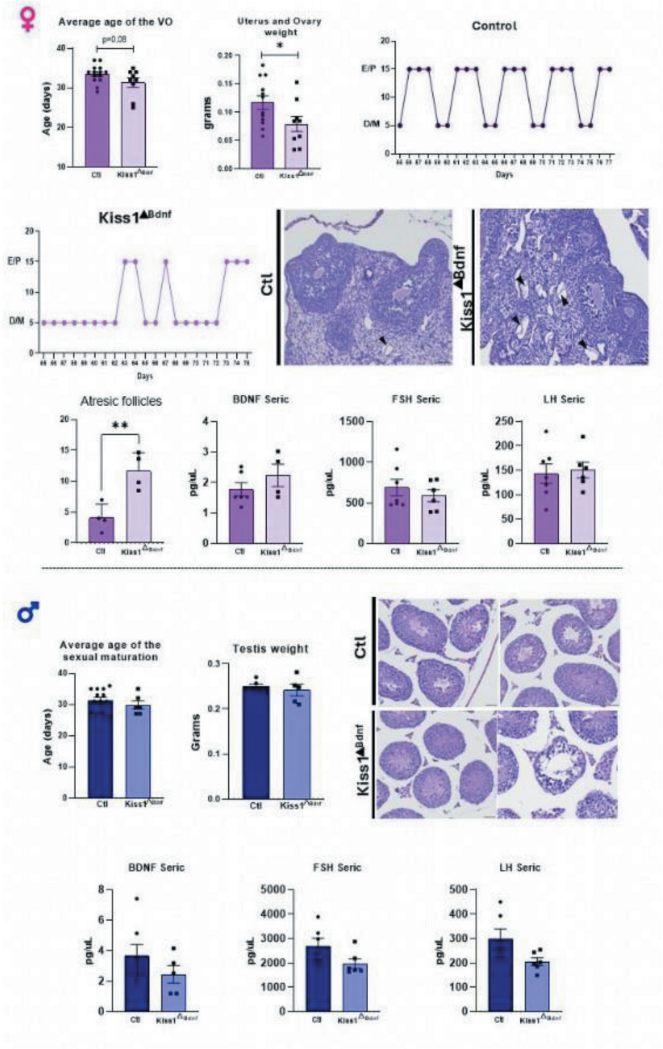


Fig. 4. Sexual parameters characterization in male and female mice lacking BDNF in Kiss1 neurons.

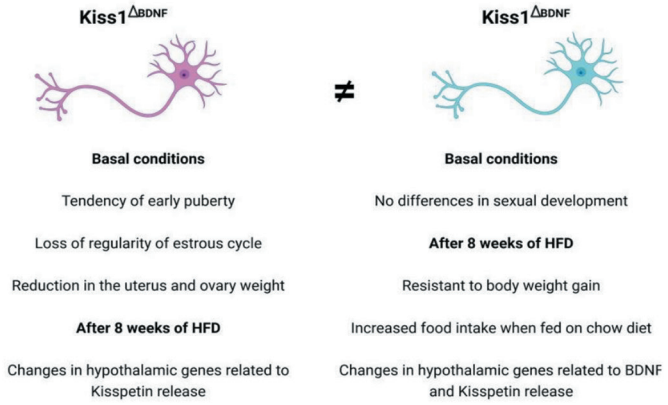


Fig. 5. Summary of results.

expenditure in actions mediated by hypothalamic neurons. In a preliminary stage of this study, we identified BDNF in Kiss1 neurons located in the arcuate nucleus (Arc) of the hypothalamus. Kiss1 neurons integrate distinct neuronal pathways that control reproduction and energy balance, which are essential to organism survival. Based on that we decided to investigate the effects of BDNF production by Kiss1 neurons focusing on the control of energy balance and reproduction. All experiments were approved by the Animal Use Ethics Committee of UNICAMP (CEUA: 6554-1/2024 and CIBio 04/2021). We used the RNAscope in situ hybridization to identify the expression of BDNF mRNA in Kiss1 neurons in different stages of female and male mice life. Thereafter, we used a Cre-loxP approach to selectively knockout Bdnf from Kiss1 neurons. The mutant mice were then employed in phenotyping experiments. BDNF mRNA was present Kiss1 neurons in females on post-natal day 0 (P0), and in males during pubertal development (P35), this shows that BDNF expression in Kiss1 neurons occurs according to a transient and dimorphic pattern. BDNF ablation in Kiss1 neurons (Kiss1ΔBDNF) led to changes in puberty development and ovarian morphology in female mice, but no changes were observed in the sexual parameters of male mice. Nevertheless, male mice lacking BDNF in Kiss1 neurons were protected from diet-induced obesity. When fed on a chow diet, male Kiss1ΔBDNF mice, exhibited hyperphagia compared to control mice with no changes on body weight, showing a disruption in control of food intake and body weight maintenance. No differences were identified in body weight gain, food intake, and adiposity in Kiss1ΔBDNF female mice. The transient expression of BDNF specifically in Kiss1 neurons is important to control many aspects of adult life, such as energy balance and sexual development. Based on that, we conclude that BDNF produced by Kiss1 exerts different functions in male and female mice. In females, it is related to sexual development and ovary morphology while in males it impacts energy balance and metabolism. This is the first study showing the effects of BDNF production by a specific neuronal group on the control of sexual development and metabolism.

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PO1.003

Identification of fibromodulin in adipose tissue as a potential therapeutic target in children with obesity

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Introduction: Obesity excessively increases both, subcutaneous (SAT) and visceral (VAT) adipose tissues, causing metabolic alterations. Given the heterogeneity and differences by age and sex of these depots, the impact of obesity on adipose tissue from children is unknown. In the KIDSADIPOSEQ study, gene expression was analyzed from biopsies of SAT and VAT from children between 2 and 14 years of age. We highlighted the fibromodulin (*FMOD*) gene as one of the most differentially expressed among children with obesity. FMOD is a protein that regulates remodeling of the extracellular matrix (ECM). Maintaining or restoring adipose tissue ECM in adipose tissue may prevent tissue fibrosis, inflammation and insulin resistance.
Objectives: To identify and characterize the FMOD protein in visceral and subcutaneous adipose tissue from children with obesity.
Methods: RNA sequencing was performed on 66 biopsies of SAT and VAT from 19 girls and 16 boys. The differential expression analysis was developed taking into account obesity status, type of deposit, sex and age. A functional enrichment analysis was also performed. Likewise, FMOD expression and protein levels were determined in subcutaneous and perigonadal adipose tissue samples from mice, fed a chow diet (CD) and a high-fat diet (HFD), by real-time qPCR and Western blot, respectively.
Results: FMOD gene expression levels are decreased on SAT and VAT from children with obesity compared to children with normal weight. However, FMOD protein levels are higher in SAT from mice fed a HFD compared to CD mice.
Conclusions: These results suggest that FMOD could have an important role in ECM remodeling of adipose tissue in obesity. Further analysis are needed to confirm the specific mechanism of FMOD in both SAT and VAT of children with obesity.

Conflict of Interest: None Disclosed

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PO1.004

Effects of A2 milk on intestinal barrier integrity and adipose tissue inflammation

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Introduction: Obesity is associated with a condition of chronic low-grade systemic inflammation characterized by increased proinflammatory cytokine secretion from adipose tissue, that is often linked to intestinal barrier dysfunction. Diet composition plays an important role in body metabolism and certain dietary components, including milk proteins, have been claimed to determine the predisposition to specific disorders. Specifically, β-Casein, a major protein in cow's milk, mainly exists in two genetic variants: A1 and A2 types. A1 milk consumption has been associated with enhanced inflammatory markers, whereas A2 milk has been associated with beneficial effects.
This study aimed to evaluate the effects of A1 and A2 milk variants on intestinal barrier integrity and inflammatory responses in in vitro models of intestinal and adipose cells.
Methods: A1 and A2 milk samples were in vitro digested according to the INFOGEST protocol (1) and subsequently administered to Caco2/HT-29 intestinal co-cultures, as a model of human intestinal epithelium (2). The digestates metabolized by the intestinal cells were administered to cultured human adipocytes (3) to assess the inflammatory response. Intestinal barrier integrity was assessed by transepithelial electrical resistance (TEER) and Lucifer Yellow (LY) permeability assay. The expression of tight junction proteins (TJP1, CLDN1, OCLN) was evaluated in intestinal cells by qRT-PCR and western blotting. Inflammatory markers (IL6, TNFα, IL8 and MCP1) were analyzed in both intestinal and adipose cells by qRT-PCR and ELISA.
Results: A1 and A2 milk digestates preserved intestinal barrier integrity, as indicated by TEER values and LY permeability compared to control. Tight junction protein expression was enhanced by A2 milk treatment for 48h compared to A1 milk, suggesting a potential role of A2 milk in the structural reinforcement of the barrier. In human adipocytes, A2-derived metabolites increased adiponectin expression and reduced MCP-1 and IL6, suggesting an improvement in the inflammatory profile. Conversely, A1-derived metabolites exacerbated inflammatory responses and reduced adiponectin levels.
Conclusions: A2 milk preserves the intestinal barrier integrity and reduces adipocyte inflammation. These effects underline the potential of A2 milk as a dietary intervention to mitigate obesity-related inflammation. Further studies are needed to confirm these findings in clinical settings and explore their implications for personalized nutrition strategies in obesity management.

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PO1.005

Multi-Omics Approach for Identifying Novel Candidate Molecules to Activate Adipose Tissue

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Introduction: The pharmacological induction of thermogenesis is a promising therapeutic strategy, as energy expenditure increases through this process. Despite the discovery of various bioactive molecules capable of activating adipose tissue thermogenesis, none have demonstrated significant effectiveness or health benefits in clinical trials. This study aims to identify new candidates that could enhance the thermogenic activity of adipose tissue through multi-omics analysis of paired human brown and white adipose tissue biopsies.
Methods: Brown adipose tissue samples from the deep neck region, characterized by enriched *UCP1* mRNA expression and multilocular lipid droplet morphology, along with adjacent subcutaneous white adipose tissue biopsies, were collected from 15 patients undergoing thyroid surgery. These samples underwent transcriptomic analysis (next-generation RNA sequencing), metabolomic, and lipidomic profiling (Mass Spectrometry). Comprehensive bioinformatics, including pathway analyses using GO (Gene Ontology) enrichment, KEGG (Kyoto Encyclopedia of Genes and Genomes), and BioPAN (Bioinformatics Methodology for Pathway Analysis), was performed on the resulting data. Additionally, we performed a functional screening to identify novel regulators of brown adipocyte activity. We individually silenced 100 genes identified by the transcriptomic analysis using siRNA transfection and studied their effect on mitochondrial respiration in hMADS cells differentiated into brown adipocytes.
Results: The analyses identified 4,174 transcripts (FDR<0.01), 59 metabolites ($p<0.05$), and 240 lipid species ($p<0.05$) differentially regulated between brown and white adipose tissue. Evidence revealed an enrichment of membrane and mitochondrial lipids in brown fat, whereas neutral glycerolipids and fatty acids were predominant in white adipose tissue. Lipidomic pathway analysis (BioPAN) highlighted activation of phosphatidylserine synthesis and triglyceride reesterification in brown fat. Several lipid-processing genes, such as *DGAT2, PISD, PTDSS1, CHPT1*, and *PEMT*, were identified as potential candidates, supported by transcriptomic data showing differential regulation of these genes. Multi-omics factor analysis revealed two factors explaining nearly 60% of the variability between brown and white adipose tissue, with purine metabolites emerging as significant contributors to these factors. Additionally, the functional screening revealed several genes, knockdown of which significantly affects individual parameters of mitochondrial respiration of cultured human brown adipocytes.
Conclusion: This comprehensive multi-omics analysis of human brown and white adipose tissue identified novel candidate transcripts, metabolites, and lipids with the potential to enhance adipose tissue thermogenic activity. We have validated 100 genes identified by this approach and uncovered several novel regulators of brown adipocyte activity. Further studies are required to elucidate their role in the regulation of non-shivering thermogenesis.

PO1.006

Novel strategies to analyze obesity-associated adipose tissue dysfunction and fibrosis adipocyte 3D spheroids

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Introduction: Obesity is a highly prevalent, multifaceted condition characterized by excessive and/or abnormal accumulation of adipose tissue. This pathological state disrupts the equilibrium between the synthesis and degradation of the extracellular matrix (ECM), culminating in tissue fibrosis. We and others have successfully established optimized in vitro three-dimensional (3D) models that simulate the extracellular microenvironment characteristic of obesity. Nevertheless, studies using 3D spheroids based on adipose tissue cell types remain limited. Herein, we aimed at developing spheroid culture models using adipocyte cell lines or primary preadipocytes isolated from subcutaneous (SAT) and visceral adipose tissue (VAT) samples of individuals with obesity.
Methods: 3T3-L1 cells were seeded at different densities (8000-32000 cells/well) into low-attachment plates and the resulting spheroids were differentiated using standard protocols until day 10. The stromal vascular fraction from SAT and VAT samples of patients undergoing bariatric surgery isolated and cultured under standard conditions. Following two passages, 5,000 cells were seeded into 96-well low-attachment plates, facilitating spheroid formation over 48 hours. Thereafter, the spheroids were treated with a differentiation cocktail, and samples were collected at different time points (0, 3, 6, 10, and 14). Optical microscopy images were captured for both 3T3-L1 cells and primary cell-based spheroids at different time points to monitor growth dynamics. Spheroid viability and lipid accumulation at different stages of differentiation or upon exposure to obesogenic insults were assessed using confocal microscopy. Serial cryostat sections were prepared for hematoxylin and eosin and Oil Red O staining, while RNA extraction was performed to analyze the temporal expression of genes related to differentiation and ECM formation.
Results: Our studies show that spheroids derived from 3T3-l1 cells or SAT and VAT exhibited continuous growth throughout the differentiation period. In fact, human adipocytes from patients with obesity (especially from VAT), which hardly differentiated in classical 2D culture, were able to differentiate when grown in spheroids. Spheroids remained viable, showing a progressive increase in lipid droplet production as differentiation advanced. Histological analysis confirmed that the spheroids were composed of tightly packed cells forming a cohesive 3D structure across all layers. Furthermore, gene expression analysis revealed significant differences in the expression of adipogenesis and ECM-related genes between day 0 (D0) and day 10 (3T3-L1 cells) or 14 (human adipocytes), highlighting dynamic changes in adipocyte maturation and ECM composition over the differentiation timeline.
Conclusions: The use of 3D adipocyte culture models, either of cell lines or primary cells, provides new opportunities to elucidate the molecular bases of the pathogenic processes associated with obesity, such as fibrosis. These models simulate a more physiologically cellular relevant environment, making them more appropriate for translational and clinical research than traditional 2D cultures.

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PO1.007

Neuropeptide y (NPY) deletion in tyrosine hydroxylase neurons alter metabolic regulation of transgenic mice

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Introduction: The hypothalamus integrates central and peripheral signals to control several autonomic functions, including the body's energy balance. A considerable fraction of this regulation is exerted through sympathetic connections with systemic organs and tissues regulating energy homeostasis and glucose metabolism. Preliminary data from University of Oxford have identified a subpopulation of autonomic neurons, the tyrosine hydroxylase (Th) neurons, which express NPY and innervate the brown adipose tissue (BAT) controlling thermogenesis. However, the role played by these autonomic fibers in regulating systemic metabolism is currently unknown. This is the first study consisting of metabolic phenotyping of transgenic mice that do not express neuropeptide y (NPY) in tyrosine hydroxylase neurons.
Methods: We evaluated a transgenic mouse model that does not express NPY specifically in neurons Th (Thcre/ Npyflox). Metabolic phenotyping of chow-fed and high-fat diet (HFD, 45%), males and females (n = 8/group/sex) was carried out over 16 weeks (16W) and included control (CT; Thcre+/ Npyflox-) and knockout (KO_NPY; Thcre+/ Npyflox+) mice groups. The characterization of the transgenic mice for body mass and food intake was carried out over 16W. All the groups were individualized in the 6th week of life and remained on the chow diet until the 16th week, except for the groups on the high-fat diet, which was introduced in the 8th week. Glucose tolerance test (ipGTT), Hyperinsulinemic–Euglycemic CLAMP test and gene expression by RT-PCR (BAT and hypothalamus), were performed at 16W. Furthermore, pancreatic islets were isolated for analysis of static insulin secretion by radioimmunoassay (RIA).
Results: There were no changes between groups in body mass and food intake in the chow diet and HFD conditions (males and females). Only under chow diet and males, it was observed that the KO_NPY group had greater glucose intolerance compared to the CT group at 16W (P = 0.003). However, the KO_NPY group is highly sensitive to insulin compared to the CT group (P = 0.0189), the same demonstrated in females (P = 0.0014). Nevertheless, there was no difference in insulin secretion in the pancreatic islets. Insulin concentrations increased significantly in the CT group under HFD compared to the chow diet, without difference between the groups for males and females. A reduction in the expression of thermogenic genes was observed in the KO_NPY group compared to the CT group, as well as significant increase in the Fgf21 gene, an important systemic regulator of glucose homeostasis, in the KO_NPY group on chow diet. In addition, the KO_NPY group showed greater expression of inflammatory genes in the hypothalamus under HFD compared to the CT group, without difference between the groups for the other genes.
Conclusion: Preliminary results demonstrate that NPY deletion in peripheral neurons can alter metabolic regulation, particularly in glucose metabolism, under normal metabolic conditions on a chow diet.

Conflict of Interest: None Disclosed.

Funding: Research relating to this abstract was funded by São Paulo Research Foundation (FAPESP).

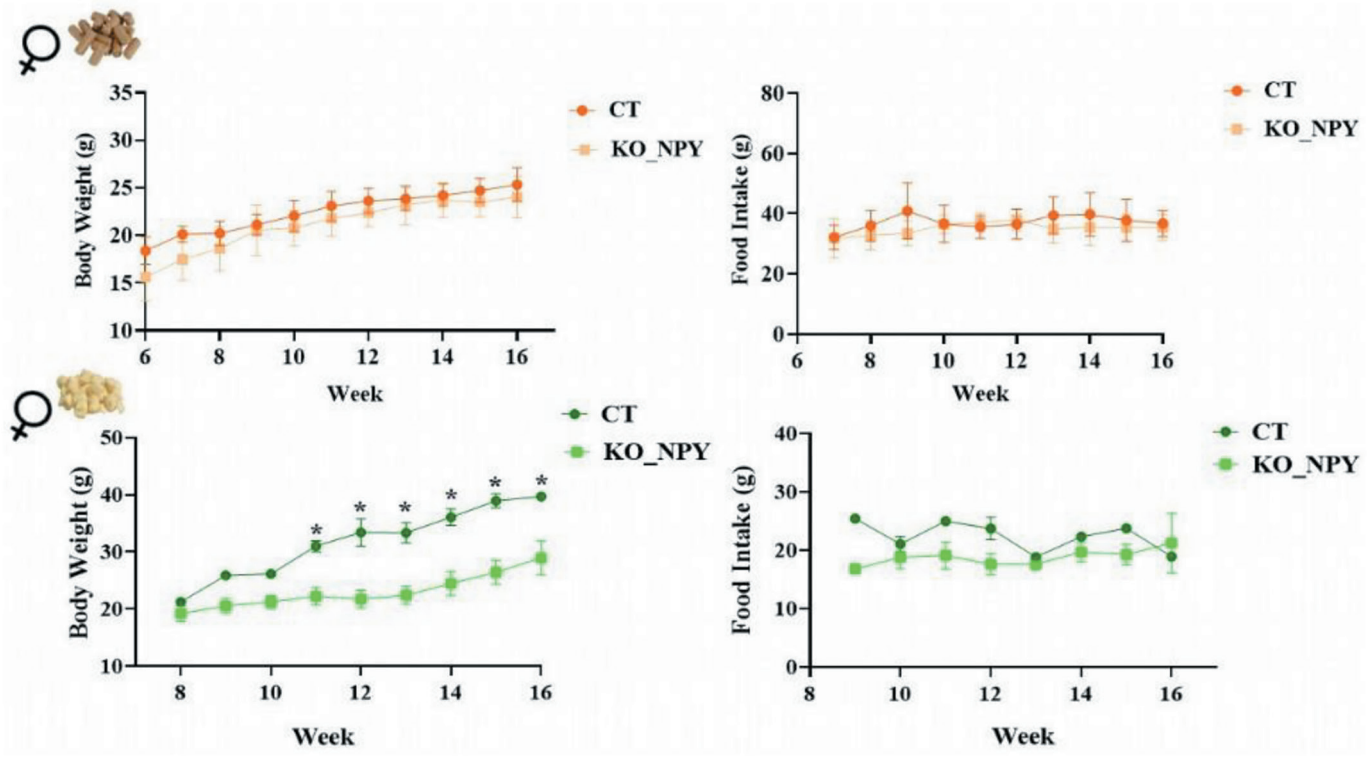


Fig. 1. Body mass and food intake female.

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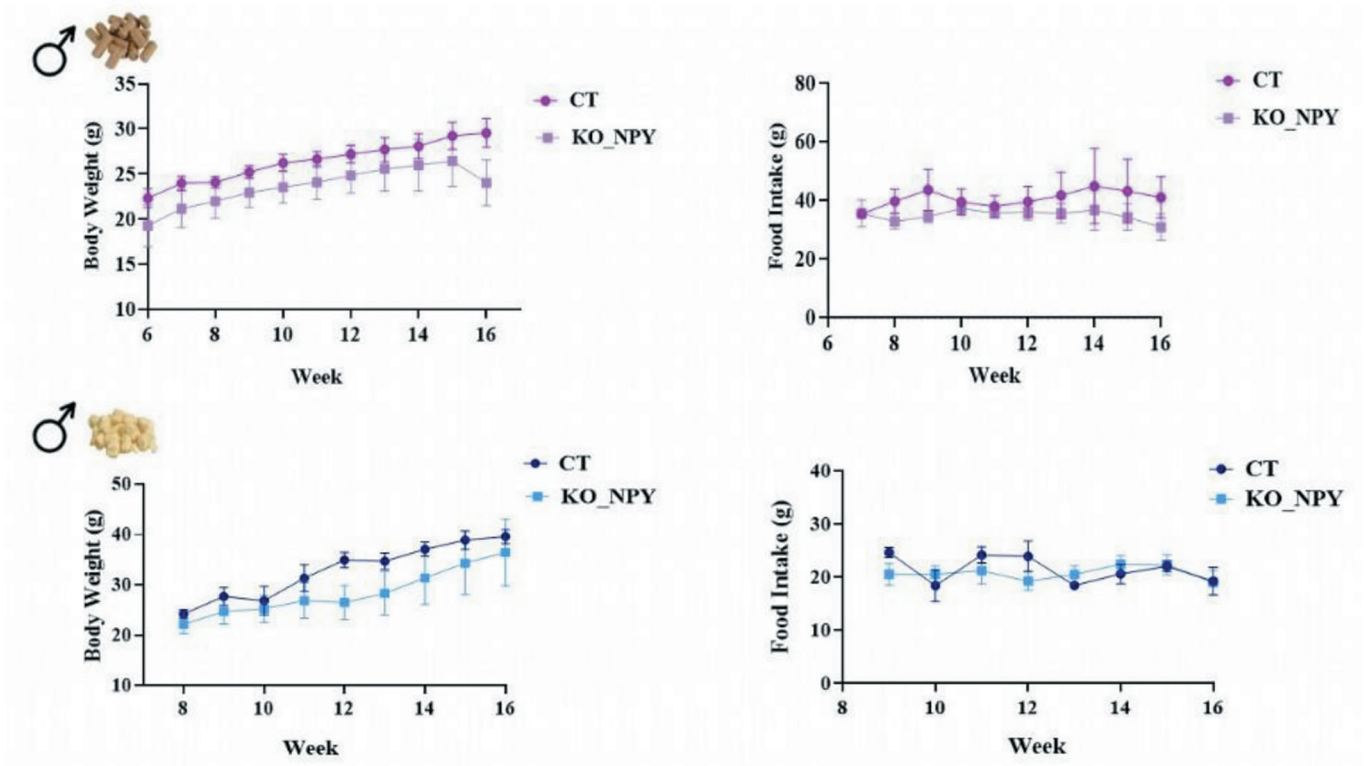
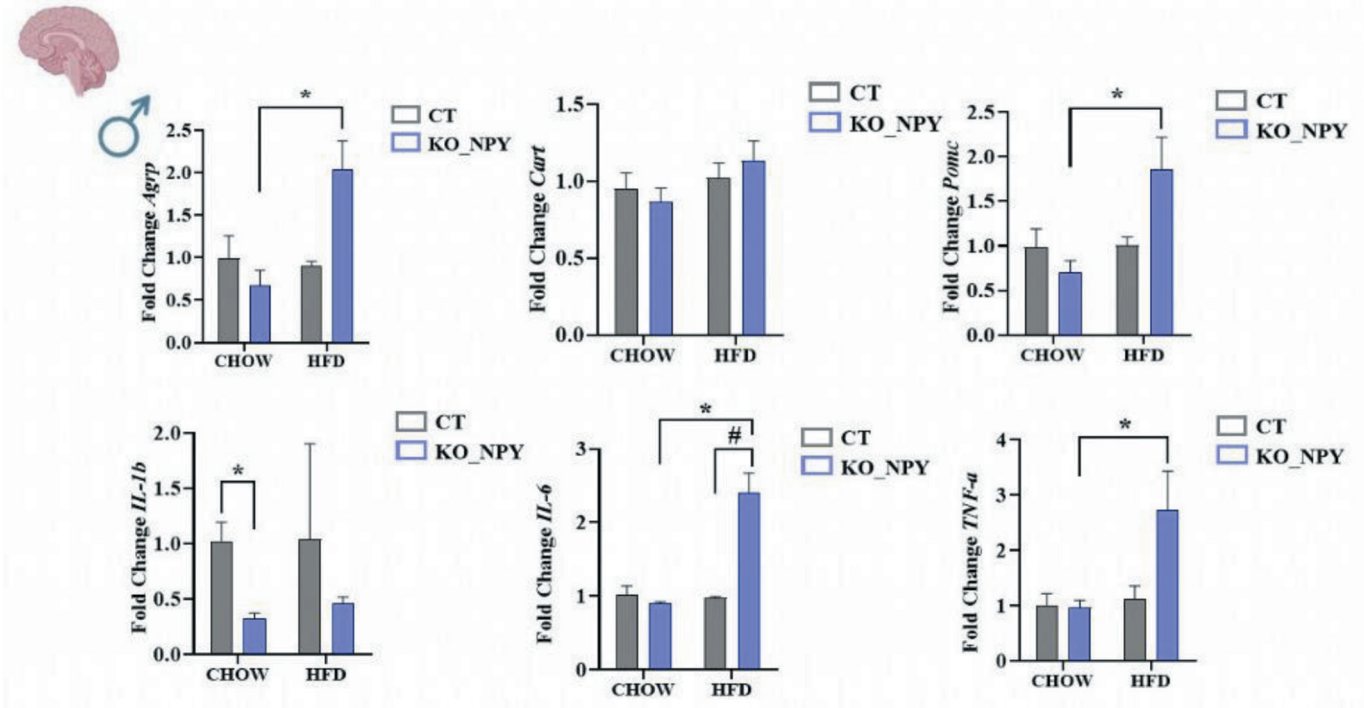


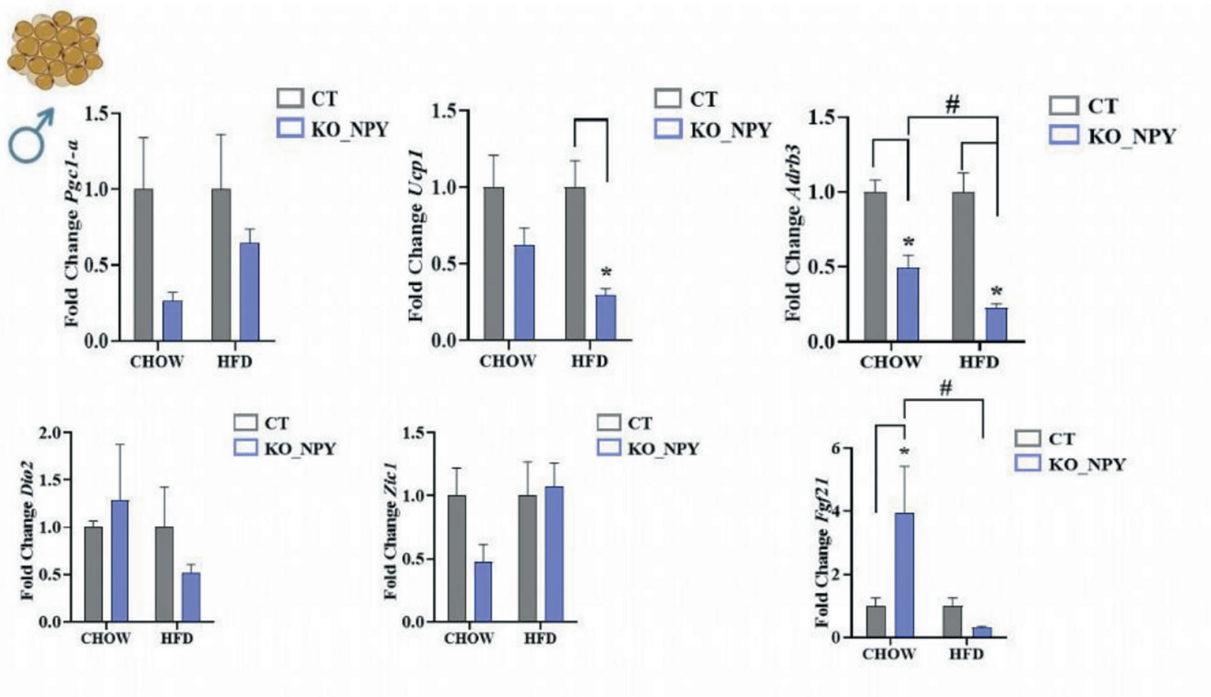
Fig. 2. Body mass and food intake male.



Gene expression in brown adipose tissue and hypothalamus - male on chow diet and high-fat diet

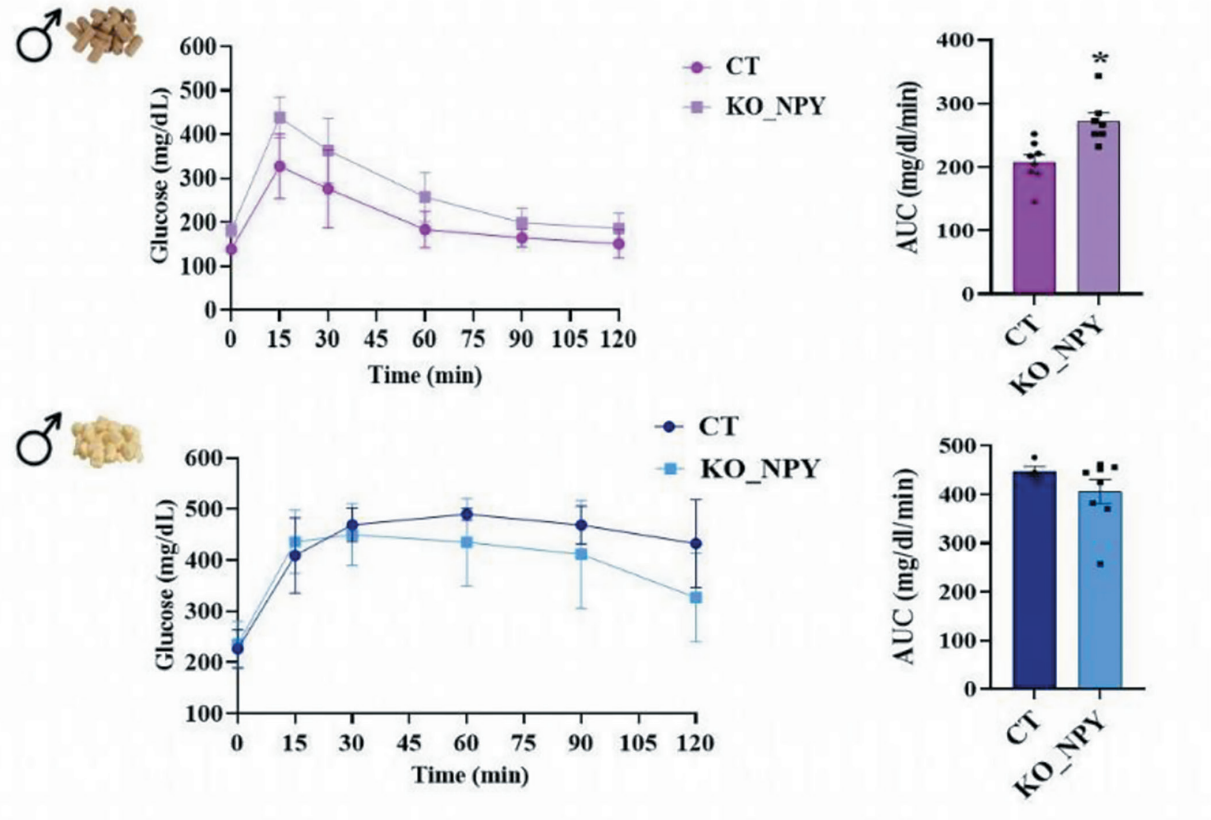
Fig. 3. Gene expression.

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Gene expression in brown adipose tissue and hypothalamus - male on chow diet and high-fat diet

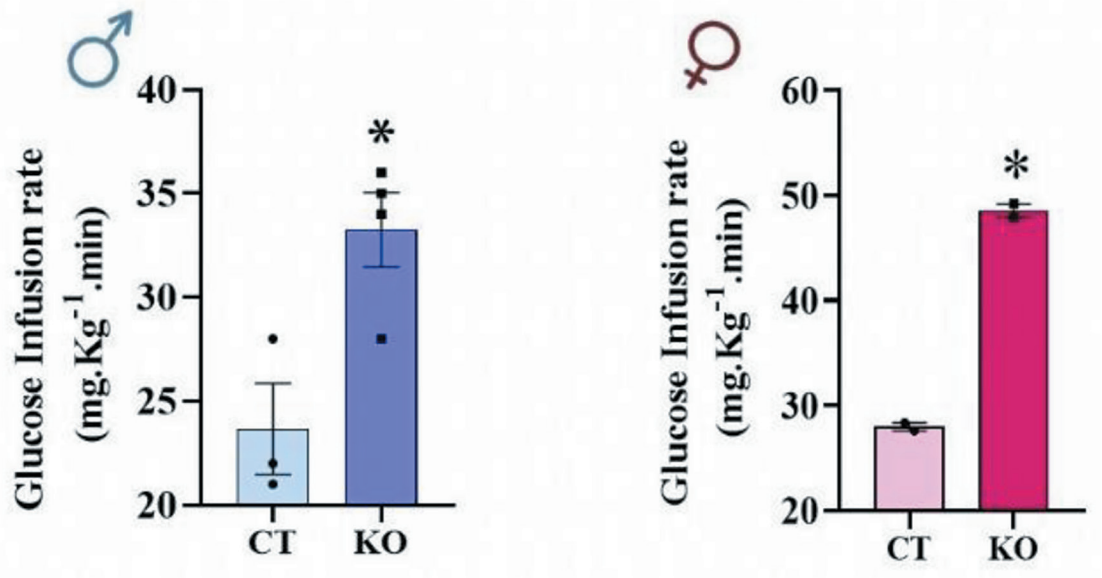
Fig. 4. Gene expression.



Glucose Tolerance Test in male mice on a chow diet and high-fat diet.

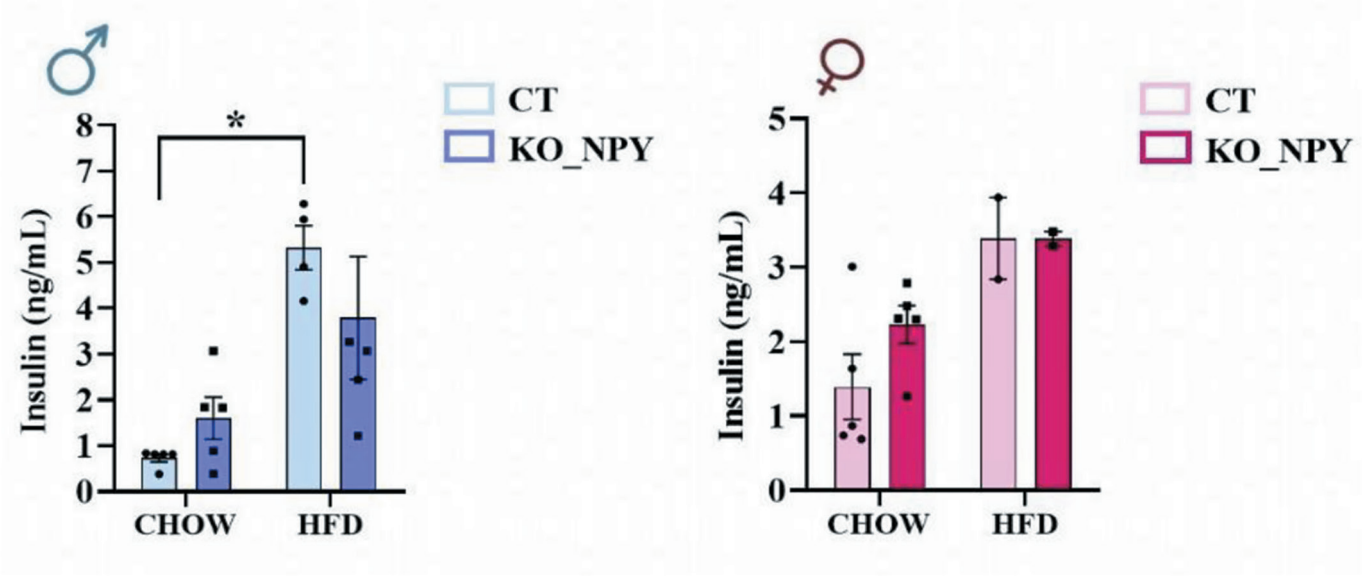
Fig. 5. Glucose Tolerance Test.

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Hyperinsulinemic–Euglycemic CLAMP test on chow diet in male and female mice

Fig. 6. Hyperinsulinemic–Euglycemic CLAMP test.



Plasma insulin concentration by ELISA test

Fig. 7. Plasma insulin concentration.

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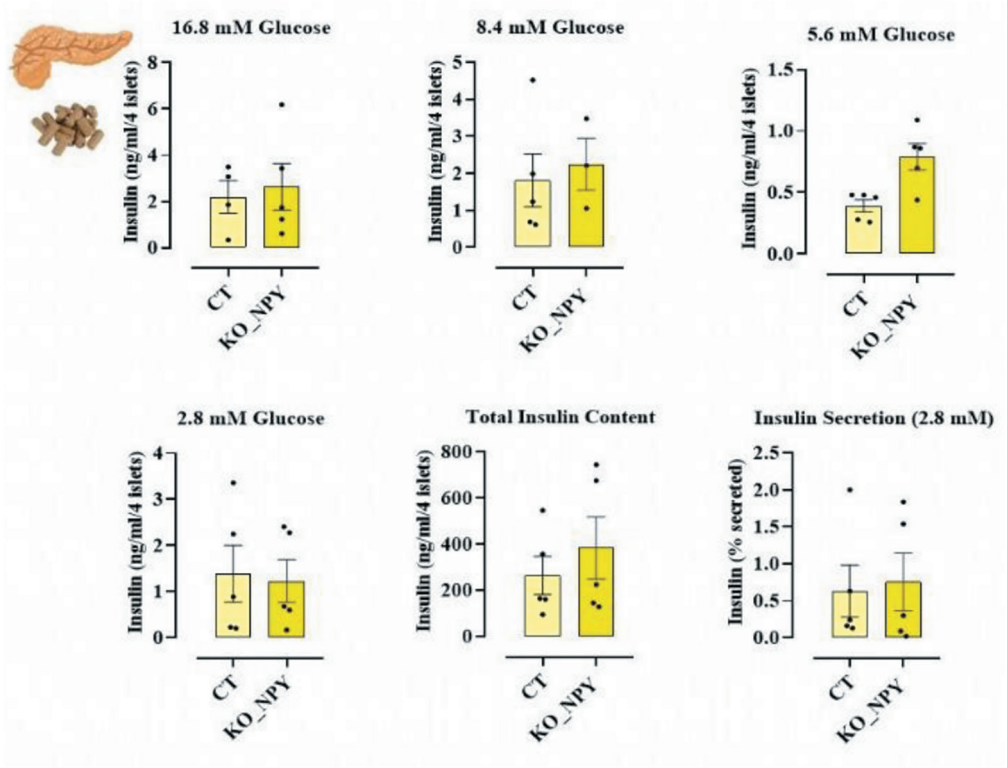


Fig. 8. Static insulin secretion by radioimmunoassay.

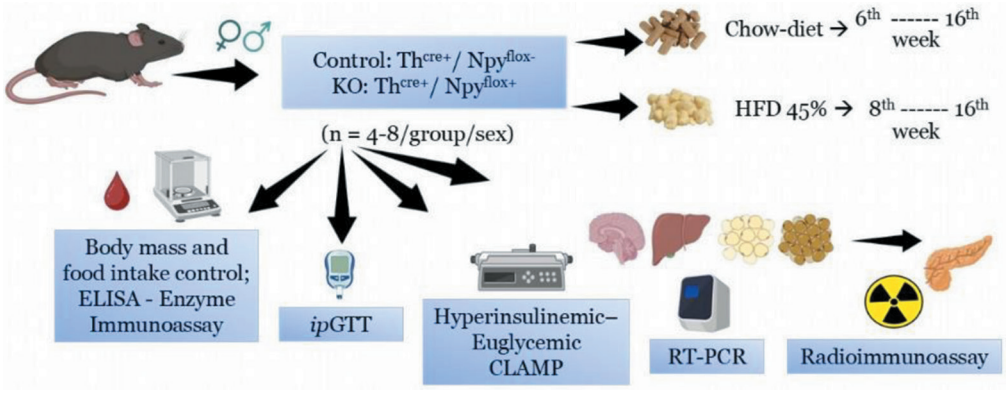


Fig. 9. Study design.

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PO1.009

Gastric microbiota-specific signatures in adults with obesity and Helicobacter pylori-negative gastritis: A case-control study

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Background: The role of the gastric microbiome in the pathophysiology of gastritis beyond *Helicobacter pylori* infection is poorly understood, and has remained unexplored in patients with obesity. The aim of this study was to analyze gastric mucosa-associated microbiota in patients with obesity and non-atrophic chronic gastritis, in the absence of *Helicobacter pylori* infection or history of *Helicobacter pylori* eradication.
Methods: This was a case-control study conducted at Virgen de la Victoria University Hospital in Malaga, performed in patients with severe obesity (body mass index ≥ 40 kg/m^2) undergoing sleeve gastrectomy, without *Helicobacter pylori* infection and no history of *Helicobacter pylori* eradication. Gastric biopsy specimens were collected at surgery and were analyzed by 16S rRNA sequencing. Participants were divided into two groups according to the histological evaluation: non-atrophic chronic gastritis and non-gastritis. An exploratory prospective analysis to determine the influence of gastritis in short-term outcomes after surgery was also performed.
Results: Sixty-seven participants (38 in the gastritis and 29 in the non-gastritis group) were included. A lower alpha diversity (evenness and Shannon diversity indexes) and beta diversity (weighted Unifrac distance) were shown in the gastritis group. Higher relative abundances in the families *Micrococcaceae*, *Streptococcaceae* and *Leuconostocaceae* and the genera *Streptococcus*, *Weissella* and *Cryptobacterium* were observed in the gastritis group, compared with the non-gastritis group. An enrichment in pathways involved in toluene degradation, heterolactic fermentation, and secondary metabolites biosynthesis, such as ergothioneine and terpenoids, was found in the gastritis group. Also, higher total cholesterol levels 1 year after the surgery were observed in the gastritis group compared with the non-gastritis group, although no within-group differences from baseline to 1 year were detected in this parameter.
Conclusion: Our results suggest a relationship between the gastric microbiome and non-atrophic chronic gastritis in obesity, beyond *Helicobacter pylori* infection.

Conflict of Interest: None Disclosed.

Funding: This study has been funded by Instituto de Salud Carlos III (ISCIII) through the project CP20/00066 and co-funded by the European Union. CiberObn.

PO1.010

Promoting Superior Weight Loss with Lean Mass Preservation: RES-010 Enters Clinical Trials to Revolutionize Obesity Treatment

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Introduction: Nearly two billion individuals worldwide are affected by obesity, which is a major contributor to cardiovascular problems, type 2 diabetes, and metabolic-associated fatty liver disease. Current medications, such as GLP1-receptor agonists, decrease appetite to provide fast weight loss, but they have limitations such as rebound in terms of weight gain, and loss of lean mass. These limitations emphasize the necessity of novel strategies that provide long-term sustainable metabolic advantages. We identified miR-22 as a critical regulator of lipid and energy homeostasis, making it a promising therapeutic target. miR-22 is upregulated in obesity, promoting lipogenesis and reducing energy expenditure. Based on these insights, we developed RES-010, a chemically modified antisense oligonucleotide (ASO) that inhibits miR-22. Unlike GLP1-RA, RES-010 induces gradual, sustained weight loss through metabolic rewiring.
Methods: Preclinical studies were conducted in multiple animal models from diet-induced obese mice, to non-human primates (NHP), and also in 3D human organoids. A full set of toxicology studies in rodents and non-human primates established the safety profile of RES-010, enabling its transition to Phase 1 clinical trials. RES-010 has entered Phase 1 clinical development. Single Ascending Dose (SAD) studies are underway to confirm safety and tolerability.
Results: In mice, RES-010 achieved gradual, sustained weight loss, reducing body weight independently of caloric intake. Unlike Semaglutide RES-010 present a disease modifying effect that last also in absence of treatment. Combinatory treatment with Semaglutide enhanced weight loss (>20% in 50% of mice) reducing fat mass while preserving lean mass RES-010 therapeutic effect were maintained during the drug-free period, in terms of weight stability and improved lipid profiles. In NHP, RES-010 promoted WAT browning, increased mitochondrial activity, and enhanced lipid metabolism. In 3D human organoid models, it upregulated UCP1 and PGC1α, outperforming rosiglitazone in browning induction. These findings confirm its translational potential, revealing profound transcriptional changes that suppress lipogenesis, enhance mitochondrial function, and support energy homeostasis.
Conclusion: RES-010 represents a significant advancement in obesity and MAFLD treatment by targeting miR-22, enhancing current therapies like GLP1-RA and overcoming their limitations. RES-010 benefits include preservation of lean mass and sustained metabolic improvements. The combination of Semaglutide and RES-010 represent a new therapeutic strategy: rapid induction weight loss with Semaglutide followed by long-term maintenance with RES-010 monotherapy. This approach addresses key barriers in obesity management, like compliance, sustainability, and lean mass preservation. RES-010, which is presently undergoing Phase 1 studies, has the potential to revolutionize the treatment of obesity. Its unique mechanism, unrelated to appetite suppression, provides an innovative treatment with increased effectiveness, long-lasting advantages, and a sustainable strategy for addressing the growing problem of obesity.

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PO1.011

Dietary shifts in China: the rise in consumption of fast-food meat products and their impacts on obesity and cancer risk

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Over the past three decades, rapid economic, social, and cultural changes in China have shifted dietary patterns from a traditional diet high in staple foods, coarse grains, vegetables, and fruits to a Western diet high in animal foods and other energy-dense foods. Currently, the Chinese market offers more than 500 different kinds of processed meat products, including both Chinese-style and Western-style options. Chinese-style products make up 45% of the total, while Western-style products account for 55%. Meat products served in Western-style fast-food restaurants are often perceived as safer than those in local traditional restaurants. However, the growing demand for fast-food meat products and the rapid expansion of the Western fast-food industry in China are contributing to serious public health issues, such as obesity, diabetes, cardiovascular diseases, and gastric and colorectal cancer. This study aims to investigate the consumption of fast-food meat products and evaluate their association with obesity indicators and cancer risk among the Chinese population aged 19–56 years. The daily consumption of fast-food meat products ranged from 3 to 9 g for males and 1.5 to 8 g for females. Additionally, individuals who consumed fast food twice or more per week had the highest BMI, ranging from 21.7 to 33.2 kg/m2 for males and 19.4 to 30.6 kg/m2 for females. Based on BMI data, 17% of men and 6% of women were overweight, while the obesity rates were 4.3% for men and 1.2% for women. Furthermore, the daily intake of genotoxic heterocyclic amines (HAs) from fast-food meat products ranged from 40.38 to 169.12 ng for males and 24.17 to 142.11 ng for females. Although the trend of fast-food meat product consumption has increased in recent years in the Chinese population, the risk of obesity and dietary HA intake remains lower than in Western countries. However, the consumption of products such as crispy chicken drumsticks, crispy fried chicken burgers, and traditional Chinese nuggets may still increase the risk of cancer, obesity, and other cardiovascular abnormalities.

PO1.012

Association between level of HbA1c and lipid profile in T2DM patients

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Introduction: Hyperglycemia, dyslipidemia and coronary artery disease relate well with each other in type 2 diabetes and it has been proposed that higher prevalence of cardiovascular disease in type 2 diabetes is due to chronic uncontrolled hyperglycemia. Our study aimed to find utility of Hba1c as indicator of dyslipidemia in patients with type 2 diabetes mellitus

Patients and Method: this is cross section study,We enrolled 100 T2DM and dyslipidemia patients diagnosed according to AHA guidelines in our study. excluded patients on statin or medications for dyslpidemia or anemic patients or renal and coronary artery disease. collected blood samples in both plain and EDTA vials after a fast of minimum 8-10 hours. Biochemical analysis was done in fully automated analyzer,Different parameters of lipid profile viz TC, HDL-C, LDL-C, TG were measured in serum and HbA1C in whole blood by preparing haemolysate.

Results: HbA1c was found to have significant positive correlation with total cholesterol, LDL-C, and triglyceride and significant negative correlation with HDL-C and HDL/LDL ratio. The mean value of TC, LDL-C and TG was found to be lower in patients with good glycemic control than those with poor glycemic control. But, mean value of HDL and HDL/LDL ratios were found to be higher in patients with good glycemic control than those with poor glycemic control. These differences were significant at the level of $p < 0.05$.

Conclusion: Additional use of HbA1c as indicator of dyslipidemia.

PO1.013

Evaluation of embryotoxicity and acute toxicity of trypsin inhibitor isolated from tamarind seeds: an anti-inflammatory and satietogenic protein

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Introduction: The trypsin inhibitor isolated from tamarind seeds (TTI) is being investigated for potential applications in the treatment of noncommunicable diseases (NCD), such as hypertension, obesity, and diabetes. This study aimed to assess TTI embryotoxicity and acute toxicity in adult zebrafish (Danio rerio).

Methods: TTI was extracted and isolated from tamarind seeds. Embryonic and adult zebrafish were exposed for 96 hours to three concentrations of TTI (12.5, 25, and 50 mg/L). Zebrafish embryos (n=60 per group) were evaluated for survival, hatching, malformations, and potential developmental marker alterations, in addition to cardiotoxicity and neurotoxicity tests. For acute toxicity assessment in adults (n=20 per group), survival and locomotor and anxiety-like behaviors were assessed, along with genotoxicity (micronucleus) evaluation.

Results: Embryos exposed to TTI showed no significant adverse effects, presented normal heart rates and positive reflex response in the neurotoxicity tests. In adult fish, TTI did not cause mortality or significant behavioral changes, suggesting no neurotoxicity and no genotoxicity. Histopathological analyses of the whole body showed only changes in the liver and spinal cord, similar to those observed in the control group not exposed to TTI.

Conclusion: These findings indicate TTI's biosafety and therapeutic potential in complex organisms. Further research is required to evaluate its long-term effects and efficacy in treating non-communicable diseases.

Conflict of Interest: None Disclosed

Funding: This research was also supported by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Finance Code:001) and by Pró-Reitoria de Pesquisa da UFRN (PROPESQ, process:23077.037570/2024-42). AHAM and ACL are supported by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, process: 303094/2022-2 and 308245/2023-7), respectively.

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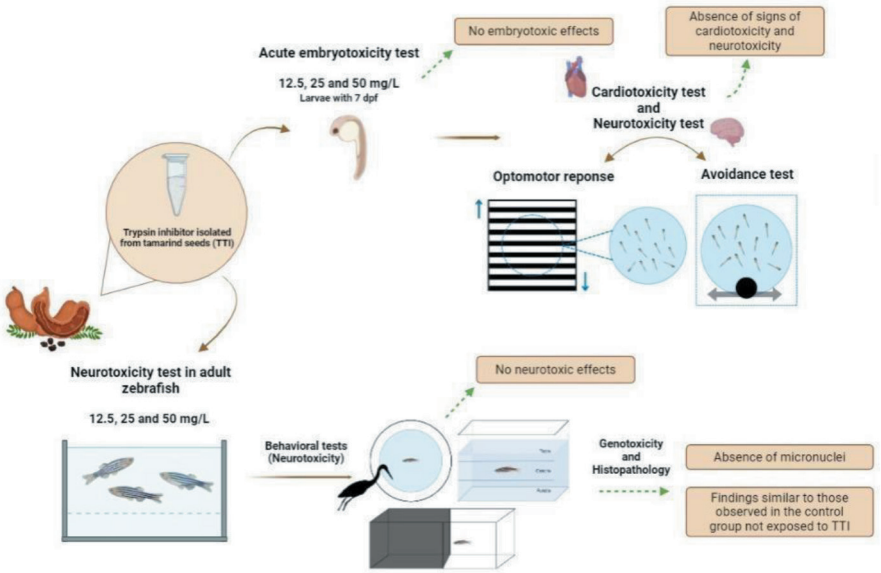


Fig. 1. Graphical resume.

PO1.014

Adipose stem cells reduced their differentiation capacity after low intensity pulsed ultrasounds stimulation

Marcelo, T. F.; Calero, A.; De Lucas, B.; Pérez, L. M.; Sury, P.; Quintana, E.; Millán, E. F.; Gálvez, B. G.

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Introduction: Ultrasounds have been used in the clinic for more than twenty years for applications mainly in imaging and bone healing. LIPUS are low intensity pulsed ultrasounds that have been demonstrated to be an effective and safe tool to treat different chronic diseases.
Methods: We analyzed the effects produced by LIPUS on mouse and human adipose stem cells derived from control populations or persons living with obesity (ASCs). Cells were stimulated with ten pulses using a traditional LIPUS device.
Results: LIPUS stimulation did not affect ASCs proliferation, morphology or cell growing. Besides, the migration and invasion capacities of ASCs were slightly affected by the LIPUS stimulationl, limiting their capacity to advance and invade. On the other hand, LIPUS stimulation interrupted the differentiation capacity of ASCs to become mature adipocytes. In fact, LIPUS-treated ASCs were unable to differentiate into mature adipocytes, by decreasing glucose and lipid metabolism.
Conclusions: Overall, while the viability of ASCs was not affected by LIPUS stimulation and minor changes were detected in migration and invasion, the blockade of the differentiation into mature adipocytes after LIPUS stimulation suggest that ASCs treated with LIPUS may limit their contribution to feed adipose tissue mass. Future functional experiments will determine the relevance of these results for the development of obesity.

Conflict of Interest: None Disclosed

Funding: Research relating to this abstract was funded by CNS2022-135241 project assigned to BGG and supported by MCIN/AEI /10.13039/501100011033 and by NextGenerationEU/PRTR.

PO1.015

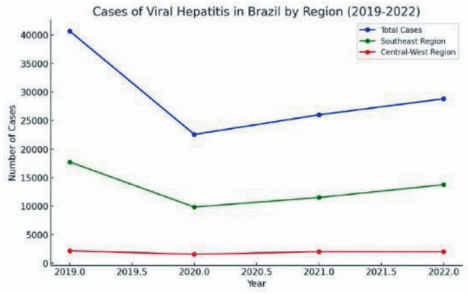
Analysis of viral hepatitis cases in brazilian regions from 2019 to 2022

Ronconi, R.

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Introduction: Viral hepatitis is an infection that affects the liver, and can cause from mild changes to severe and chronic conditions. Among the types of hepatitis, the most prevalent and significant in terms of impact on public health are types A, B and C, which have different characteristics and modes of transmission. Hepatitis A is transmitted by the fecal-oral route, often associated with poor sanitation conditions and is usually self-limiting, not becoming chronic. Hepatitis B, transmitted mainly by bodily fluids such as blood and secretions, can progress to the chronic form, increasing the risk of cirrhosis and liver cancer. In addition, hepatitis C is transmitted mainly by blood and has a high rate of chronicity, being one of the main causes of serious liver diseases in the long term.
Objective: To observe and analyze the number of viral hepatitis cases in Brazilian regions from 2019 to 2022.
Methodology: This study was conducted using data from the Notifiable Diseases Information System (SINAN), available in the database of the Department of Informatics of the Unified Health System (DATASUS). The analysis covered the period from 2019 to 2022, taking into account the region and year of notifications.
Results: In 2019, 40,680 cases were recorded, with the highest count of 17,734 cases in the Southeast region and the lowest of 2,173 cases in the Midwest. In 2020, the total value decreased by 55.47% to 22,565 cases. Of these, the Southeast reported the majority with 9,839 cases, while the Midwest had the fewest, at 1,548 cases. In 2021, cases rose to 25,996, with 11,509 cases in the Southeast and 2,015 in the Midwest. In 2022, the figure increased by 10.8% to 28,806, with the Southeast again having the highest value of 13,749 cases and the Midwest the lowest at 2,001 cases.
Conclusion: Between 2019 and 2022, viral hepatitis cases fluctuated, with higher incidence in the Southeast and lower in the Midwest. After a decline in 2020, there was a gradual increase through 2022, suggesting recovery in post-COVID-19 reporting. The prevalence in the Southeast reflects both population concentration and regional diagnostic variations, highlighting the importance of regional strategies for viral hepatitis control and prevention in Brazil.

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This chart relates the cases of viral hepatitis in Brazil between 2019 and 2022, showing the total cases and the distribution in the Southeast and Midwest regions.

Fig. 1. Cases of viral hepatitis in Brazil by Region from 2019 to 2022.

PO1.016

Oleoylethanolamide attenuates cardio-renal damage secondary to obesity in mice: translational perspectives for cardiovascular-kidney-metabolic (CKM) syndrome

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Introduction and Methods: The pathophysiological interrelationship between obesity and diabetes with chronic kidney disease and cardiovascular disorders has been conceptualized as cardiovascular-kidney-metabolic (CKM) syndrome [1]. Metabolic alterations, particularly obesity, cause derangements of the heart and kidney, including insulin resistance (IR), lipotoxicity, inflammation, and fibrosis [2]. Oleoylethanolamide (OEA), a noncanonical endocannabinoid and peroxisome proliferator activating receptor (PPAR)-α agonist, has been extensively studied for its metabolic properties [3]. This study aimed to investigate OEA beneficial effects on high-fat diet (HFD)-induced cardio-renal damage secondary to obesity and metabolic syndrome in mice.

Results: In mice with obesity (MwO), OEA treatment improved the metabolic pattern, limiting weight gain compared to untreated mice, and reducing IR, as shown by in vivo oral glucose tolerance test. OEA treatment restored serum creatinine and BUN, markers of tubular function, which were altered by HFD feeding. OEA also reduced heart weight and serum creatine kinase-myocardial band (CK-MB), a marker of cardiac damage. As known, obesity-driven release of cytokines, chemokines, and pro-fibrotic mediators contributes to tissue damage progression in both heart and kidney. OEA exerted a marked anti-inflammatory and antifibrotic effect as showed by Hematoxylin & Eosin and Masson's Trichrome histological staining of cardiac and renal tissues, further confirmed by the reduced transcription of pro-inflammatory and pro-fibrotic markers in both tissues. Furthermore, OEA modified cardiac lipid profile of MwO as demonstrated by metabolomic analysis of different lipids including triglycerides, glycerophospholipids and sphingomyelins; consistently, OEA normalized cardiac metabolic factors reducing the expression of fatty acid translocase CD36 and regulating glucose homeostasis by activating AMPK/AKT/AS160 pathway, which converges in GLUT4 increased transcription. Likewise, OEA improves renal lipid metabolism, reducing the diacylglycerol O-acyltransferase (DGAT)1, which regulates triglycerides' trafficking. Finally, in heart and kidney, OEA significantly increased PPAR-α transcription altered by HFD, suggesting its possible direct involvement in OEA cardio-renal protective effects.

Conclusions: These results indicate that OEA may be a promising molecule for restraining CKM alterations associated with obesity and following metabolic disorders.

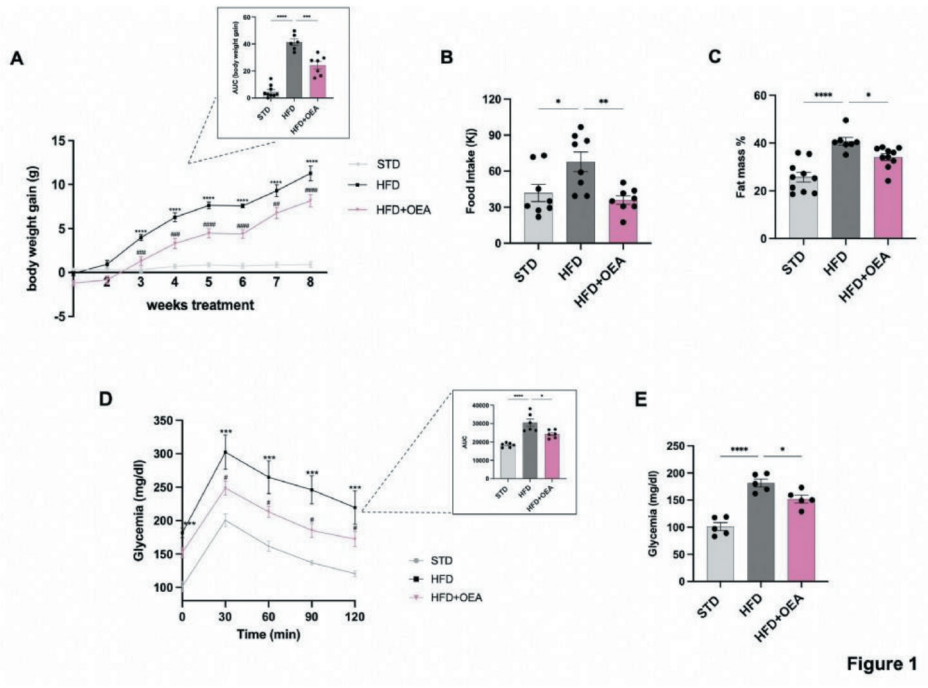


Fig. 1.

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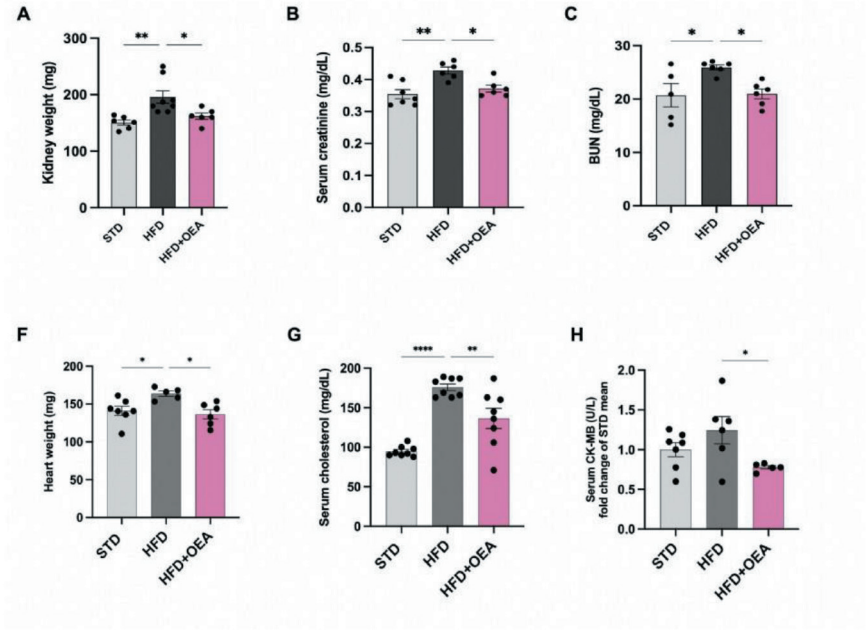


Fig. 2.

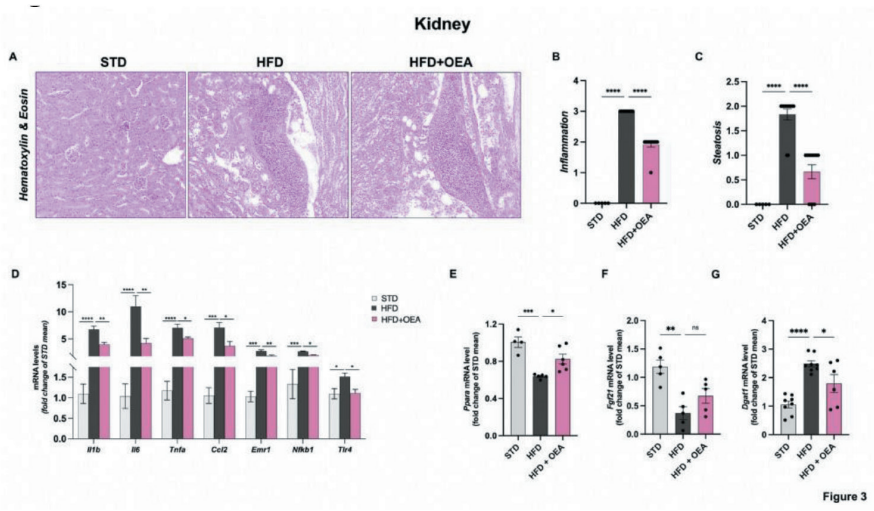


Fig. 3.

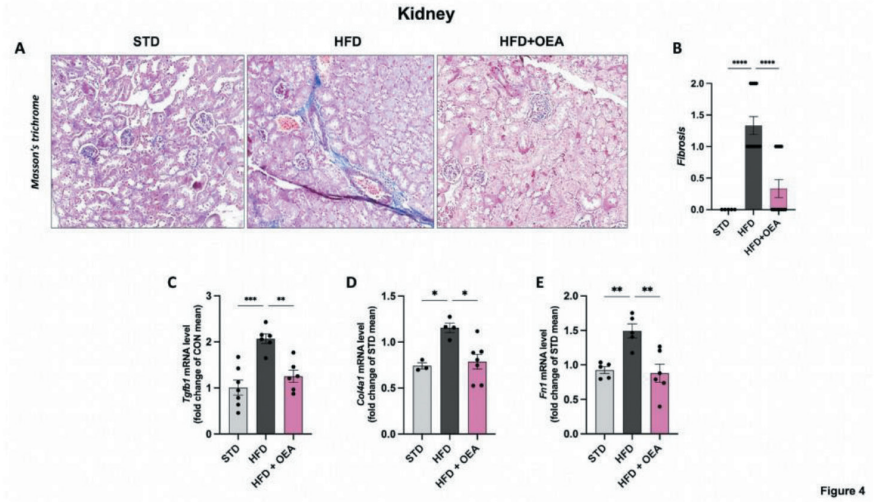


Fig. 4.

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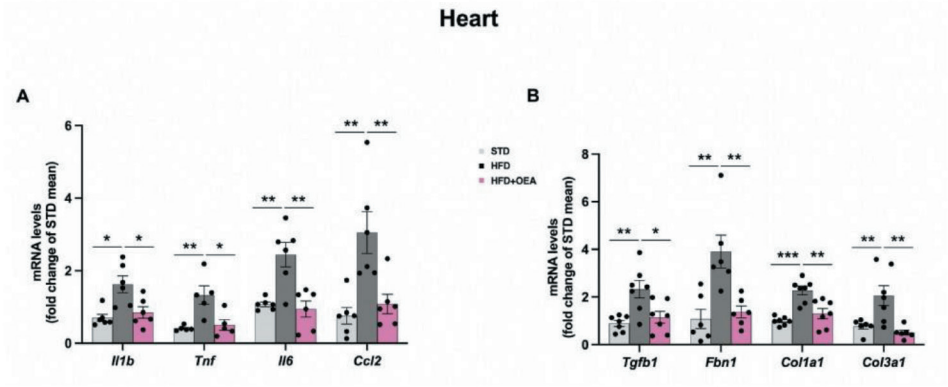


Fig. 5.

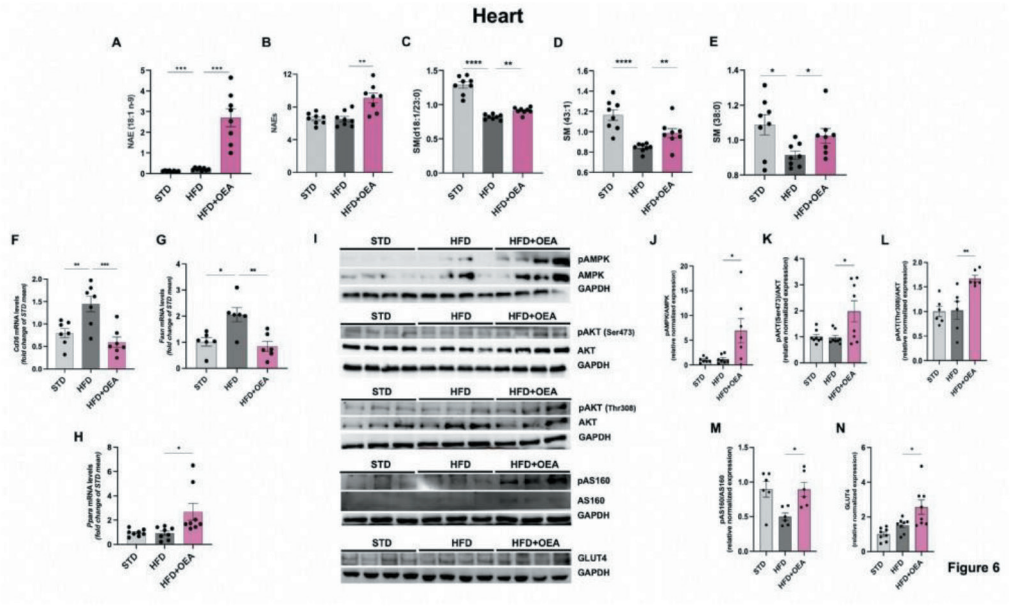


Fig. 6.

PO1.017

Tauroursodeoxycholic acid (TUDCA) treatment mitigates hypothalamic inflammation and regulates food intake in a protein-restricted mice model

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Introduction: Early childhood malnutrition impairs the development and function of several organs, including the central nervous system. This can lead to altered feeding behavior, partly due to increased expression of orexigenic genes (*Npy and Agrp*) in the hypothalamus, resulting in hyperphagia. We hypothesized that amino acid deprivation triggers hypothalamic inflammatory processes, disrupting the signaling of anorexigenic hormones and consequently dysregulating these hypothalamic control centers. This condition contributes to increased food intake, predisposing individuals with undernutrition to develop obesity and metabolic diseases. In this study, we investigated hypothalamic inflammation in a protein-restricted mice model and evaluated the effects of the anti-inflammatory compound tauroursodeoxycholic acid (TUDCA).

Methods: For this, we used male C57BL/6 mice who received a control (14% protein [C group]) or an isocaloric low-protein (6% protein [R group]) diet for 14 weeks. In the last 15 days of this period, half of the mice received i.p. PBS (groups C and R) or 300 mg/kg TUDCA (groups CT and RT). The following parameters were assessed on sacrifice: body weight (BW), albumin, total protein, and leptin levels, diet consumption, gene expression of hypothalamic neuropeptides, inflammation markers, and TUDCA receptors. Data are mean ± SEM, $P \leq 0.05$, One-Way ANOVA with an unpaired Tukey's post-hoc test. All experiments were approved by the Animal Care Committee at UNICAMP (Protocol: #6429-1/2024).

Results: R mice displayed reduced BW ($p<0.0001$), albumin ($p=0.0212$), and total protein levels ($p=0.0278$), as expected. In addition, food consumption ($p=0.0131$) and leptin levels ($p=0.0098$) were higher in R mice compared to C mice. These alterations were reflected in orexigenic neuropeptides expression since R mice showed increased *Agrp* gene expression ($p=0.0004$). Hypothalamic inflammation was also increased in R mice, as judged by the increased hypothalamic expression of pro-inflammatory cytokines (*Tnf-α*, $p=0.0203$ and *Il-1β*, $p=0.0170$) and astrocyte (*Gfap*, $p=0.0049$) and microglial (*Iba-1*, $p=0.0105$) markers. Notably, TUDCA treatment reduced food consumption ($p=0.0419$) and leptin levels ($p<0.0001$) as well as gene expression of the orexigenic neuropeptide

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Agrp (p=0.0368). Moreover, RT mice presented lower gene expression of inflammatory markers, such as *Tnf-α* (p=0.0142), *Il-1β* (p=0.0203), *Gfap* (p=0.0005), and *Iba-1* (p=0.0016) compared to R mice. Finally, we evaluated the hypothalamic gene expression of the main TUDCA receptors (TGR5, FXR, and S1PR2). TUDCA treatment increased *Tgr5* gene expression (p=0.0051) in the hypothalamus without affecting *Fxr* and *S1pr2* expression.
Conclusion: These findings suggest that TUDCA treatment, likely through the TGR5 receptor, mitigates hypothalamic inflammation. This leads to decreased *Agrp* expression and leptin levels, subsequently altering feeding behavior in a protein-restricted mice model.

PO1.018

The risk of chronic kidney disease in relation to anthropometric measures of obesity: a Swedish cohort study

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Background: It has been shown that individuals with obesity have a higher risk for chronic kidney disease (CKD). However, it is unclear which measure of obesity is most useful for prediction of CKD in the general population. The aim of this prospective study was to examine the association between different anthropometric measures of obesity (i.e., weight, body mass index (BMI), waist circumference (WC), waist-to-hip ratio (WHR), percentage of body fat (BF%), waist circumference to height ratio (WHtR)) and incidence of CKD in a large population-based cohort study.
Methods: The 'Malmö Diet and Cancer Study (MDCS)' cohort in Sweden was examined during 1991 to 1996. A total of 28,449 subjects underwent measurement of blood pressure and anthropometric measures and filled out a questionnaire. Incidence of in- and outpatient hospital visits for CKD was monitored from the baseline examination over a mean follow-up of 18 years. Cox proportional hazards regression was used to examine the association between anthropometric measures and incidence of CKD, with adjustments for risk factors.
Results: The final population for this study was 26,723. Higher values of BMI, WC, WHR, WHtR and weight were associated with an increased risk of developing CKD in both men and women. Only in women, higher values of BF% was associated with higher risk of CKD. Comparing the 4th vs 1st quartile of the obesity measure, the highest hazard ratio (HR) for CKD in men was observed for BMI, HR 1.47 (95% CI: 1.14-1.90) and weight (HR 1.47 (95% CI: 1.15-1.88). For women the highest HR for CKD was observed for BF%, HR 1.98 (95% CI: 1.43-2.74).
Conclusions: In this large prospective study, all anthropometric measures of obesity were associated with a substantially increased incidence of CKD, except for BF% in men. Some measures were slightly more predictive for the risk of CKD than others such as BMI in men and BF% in women. In clinical daily practice use of all anthropometric measures of obesity might be equivalently beneficial to predict the risk of developing CKD. This study supports the strong evidence for an association between obesity and CKD.

PO1.019

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: 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.
Method: This randomized, placebo-controlled, double-blind parallel study included 44 individuals with overweight/obesity (body mass index (BMI) 28–40 kg/m^2, 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 (TIM-2). Participants were randomized into two groups: 22 individuals received 24g of the in vitro defined PFM, and 22 received a single fibre control (galacto-oligosaccharides) daily 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 mU/L, 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 plasma branched-chain fatty acid isovalerate (P=0.030) 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.
Conclusion: Compared to the control, PFM supplementation did not affect peripheral insulin sensitivity but slightly decreased body weight and reduced HOMA-IR, suggesting a beneficial effect on hepatic insulin sensitivity. Future analyses, presumably available during the ECO 2025 conference, will include gut microbial composition and adipocyte size assessments. Personalized fibre approaches may help improve metabolic health in individuals at high risk for type 2 diabetes.

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PO1.020

DA-1241, a GPR119 agonist, ameliorates fatty liver through the upregulation of TFEB-mediated autophagy

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G protein-coupled receptor 119 (GPR119) is predominantly expressed in pancreatic β-cells, enteroendocrine cells, and the liver. It is a novel therapeutic for dyslipidemia and type 2 diabetes. DA1241, a GPR119 agonist, improves glucose tolerance by inhibiting gluconeogenesis and enhancing insulin secretion. It mitigates hepatic inflammation by inhibiting NFκB signaling. However, the mechanism by which DA1241 ameliorates nonalcoholic fatty liver disease (NAFLD) remains unknown. We hypothesized that DA1241 improves liver steatosis by inducing autophagy in a TFEB-dependent manner. It induced autophagy and TFEB nuclear translocation, and decreased lipid content in liver cell lines. Lysotracker staining and DQ-Red BSA assay revealed it increased lysosomal activity. Furthermore, DA1241 increased the colocalization of RFP-LC3 and lipid droplets, which were completely abolished by GPR119 knockdown. DA1241 treatment improved glucose tolerance and insulin sensitivity, and decreased liver enzymes activity and hepatic triglyceride levels, and the NAFLD activity score with increased number of autophagosomes and lysosomes in high-fat diet-fed mice. These effects persisted despite GLP-1 signaling suppression by EX9-39 cotreatment. Despite DA1241 treatment, lysosomal activity and subsequent lipid content reduction were not induced in TFEB knockout HeLa cells. DA1241 treatment failed to produce favorable metabolic effects, including reduced hepatic triglyceride levels, in liver-specific TFEB knockout mice. Thus, DA1241 attenuates hepatic steatosis through TFEB-mediated autophagy induction.

PO1.021

MASLD and HFpEF: the upcoming worldwide tsunami

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Introduction: Hepatic steatosis, particularly in the presence of obesity, lipid, and glucose metabolism abnormalities, is not only a cardiometabolic risk, but also progressing to liver cirrhosis and hepatocellular carcinoma. It's now considered part of metabolic syndrome, named metabolic dysfunction associated steatotic liver disease "MASLD", and HF "heart failure" is a common endpoint for many diseases processes
Main core: The prevalence of MASLD in HF-preserved left ventricular ejection fraction (HFpEF) patients can reach 50%, they share a common pathophysiology, which are the elements of the multiple hits' theory; insulin resistance, systemic inflammation, oxidative stress, impaired adiponectin, increased visceral fat, and increased systemic organ fibrosis.[1] Fibrogenesis, collagen turnover, and systemic fibrosis may be the links between HFpEF and MASLD. In any systemic disease (e.g., chronic liver diseases and HF), the synthesis and degradation of collagen, occur not only in the myocardium but also in the arterial wall, liver, and kidneys.[2] The connection between ectopic fat deposition and HFpEF is a burgeoning field within cardiovascular research, and it has been shown that visceral adipose tissue (VAT) and epicardial adipose tissue (EAT) are predictive of HFpEF, but not heart failure with a reduced ejection fraction. HFpEF is described as a multisystem disease characterized by Impaired left ventricular diastolic function, myocardial stiffness, and reduced relaxation capacity which linked to obesity and ectopic fat accumulation in the heart through the production of excess systemic FFA-mediated lipotoxicity and microinflammation within cardiomyocytes.[3]
Currently GLP1RAs are safe to use in MASH (including compensated cirrhosis) and should be used for their respective indications, namely, type 2 diabetes, and obesity, as their use improves cardiometabolic outcomes, and proper blood pressure control among hypertensive MASLD patients can decrease the risk for deterioration of cardiac function. Studies including HFpEF and MASLD patients are ongoing regarding pathophysiology, and use of pharmacotherapy.
Conclusion: Identifying MASLD patients is critically important, has proposing them for management focused on symptoms and comorbidities is mandatory for early diagnosis of HFpEF and proper assessment of the cardiac condition; thus, identifying stage A or B patients (at risk for HF, pre HF) according to the American College of Cardiology and American Heart Association (ACC/AHA) before progressing to advanced stages of HF, and providing care is challenging and mandatory given the dramatic rise in obesity and diabetes worldwide and because the vast overlap of screening for liver disease in CV patients as well as screening for liver steatosis in CV patients seems reasonable. A multidisciplinary team should support each other in the treatment of their patients, aiming for reduce the morbidity and mortality of patients with MASLD which is mainly from cardiac related complications, is crucial.

PO1.022

Culinary Uses and Health Benefits of Nettle in Türkiye

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Introduction: Turkish cuisine has been influenced by many cultures throughout history and has developed and diversified through them. The ingredients used in the kitchen stand out not only for their taste but also for their health benefits and nutrition. Among these foods, there are herbs that have high nutritional value and are prominent with their health benefits. Among these, nettle (Urtica dioica) is a frequently used herb in Turkish cuisine; it stands out in terms of taste and nutritional value. Nettle, which is usually freshly collected in the spring months, is frequently preferred in many dishes.
Methods: In this study, systematic review method was used. Studies on the use of nettle as food in Türkiye in the existing literature were examined. Its place in Turkish cuisine, areas of use, and health benefits parameters were discussed.
Results: Nettle is a plant known for its high nutritional value and health benefits. In traditional medicine, it is used in the treatment of various diseases such as rheumatism, arthritis, and allergic reactions. Its rich vitamin and mineral content are emphasized. Especially rich in vitamins A, C and K and minerals such as iron, calcium, magnesium and phosphorus, nettle can have many positive effects on health. Nettle is used in traditional medicine in the treatment of diseases such as rheumatism, arthritis, allergic reactions, and urinary tract infections. It attracts attention with its anti-inflammatory, antioxidant, and diuretic properties. In addition, it is emphasized in various studies that it can be beneficial for diabetics, heart patients and people with high blood pressure. The use of nettle in traditional recipes in different regions of Türkiye reflects the cultural diversity and the nutritional habits of the local people. In Turkish cuisine, the tender leaves and branches of nettle are used in many dishes such as soup, pastry, gözleme, kavurma, omelet, meatballs, pilaf, and salad. Its seeds are usually consumed for therapeutic purposes by brewing or eating directly.
Conclusion: Studies can be conducted to protect and promote the gastronomic potential of nettle. In addition, in future studies, the effects of nettle on health and the effects of different cooking methods on nutritional values can be tested. Comparative culinary culture field studies can be conducted in the geographies where this plant grows.

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PO1.023

Differential behavior between carotid and femoral territories in Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) patients: association with disease severity

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Introduction: Beyond hepatic complications, metabolic dysfunction-associated steatotic liver disease (MASLD) is strongly associated with extra-hepatic conditions such as obesity and DM2. However, the specific role of MASLD in the initiation and progression of atheromatous disease remains unclear. This study aims to assess various non-invasive methods for predicting liver fibrosis and their associations with subclinical atheromatous plaque burden and the number of plaques across different territories.
Methods: Atheromatous plaque burden, including quantity and total plaque area, was assessed in the carotid and femoral regions using ultrasonography in 3,940 middle-aged subjects without cardiovascular disease from the ILERVAS cohort (ClinTrials.gov Identifier: NCT03228459). The FIB-4 index was calculated for all participants and compared with the NAFLD Fibrosis Score and the Aspartate Aminotransferase to Platelet Ratio Index (APRI). FIB-4 risk categories were defined as follows: <1.30 low risk, 1.30-2.67 intermediate risk, and >2.67 high risk.
Results: Among the ILERVAS participants, 3,085 subjects (78,3%) were classified as low-risk, 794 (20,1%) as indeterminate-risk, and 61 (1,5%) as high-risk according to FIB-4 thresholds. In the carotid territory, subjects in the high-risk FIB-4 group exhibited a higher prevalence of subclinical atheromatous disease compared to those in the low-risk group (59.02% vs. 49.59%, p=0.001), as well as a greater number of plaques (1.39 vs. 1.02, p<0.001). Additionally, a positive correlation was observed between the FIB-4 score and the presence of carotid plaques (r=0.06613, p<0.001). A multivariable logistic regression model identified FIB-4 and established cardiovascular risk factors as independent predictors of atheromatous disease (yes/no) in carotid territory (p=0.027). Similarly, multivariable linear regression revealed a significant association between high-risk FIB-4 and the number of plaques in the carotid territory (p=0.026). Regarding total plaque area, the high-risk FIB-4 group demonstrated greater involvement compared to low-risk individuals (0.71 vs. 0.46 cm2, p=0.0137). However, none of these findings were replicated in the femoral territory. The NAFLD score, in the multivariable logistic regression model, showed a relationship with the presence of atheromatous disease exclusively in the carotid territory (p = 0.043), but no significant associations were found with either the number of plaques or plaque area in any vascular territory. Furthermore, no associations were observed for APRI with atheromatous disease in either the logistic or linear regression models.
Conclusions: Patients with MASLD represent a population at elevated cardiovascular risk, particularly those with advanced liver fibrosis. In this context, FIB-4 emerges as a valuable tool for predicting subclinical atheromatous disease, specifically in the carotid territory. Our findings underscore the importance of tailored cardiovascular risk assessment in MASLD patients, with particular attention to vascular territory-specific patterns in this population.

Conflict of Interest: None Disclosed.

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PO1.024

Aging and MASLD severity; exploring impact of sex differences

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Background: Men are more likely than women to have metabolic dysfunction-associated steatotic liver disease MASLD, with age-related differences. Our study aims to assess specifically the impact of female ageing on MASLD severity and its main metabolic risk factors.
Methods: A cross-sectional multicenter study included 363 participants living with overweight and obese diagnosed to have MASLD initially by liver ultrasound. Anthropometric measurements, Total lipid profile, liver enzymes, including alanine aminotransferase (ALT), aspartate aminotransferase (AST), and gamma-glutamyl transpeptidase (GGT), HbA1c%, fasting blood glucose, insulin were measured, and HOMA-IR were calculated. Steatosis was assessed by controlled attenuation parameter (Cap), along with reliable liver stiffness measurements (LSMs) through vibration-controlled transient elastography (VCTE).
Results: Males and females MASLD participants were age and sex matched, males represented 53.2%. Half of the patients (50.1%) were less than 45 years. The mean BMI was 33.6 ±7.7 kg/m2, waist circumference (WC) was 104.8 ±8.7 cm. They divided into two equal groups according to age (< 45 and ≥ 45 years old), Older persons had significantly higher body mass index (BMI), waist circumference (WC), HbA1c, and HOMA-IR. The liver fat content was higher in the older age group, and the fibrosis level was significantly worse. Men demonstrated significantly lower HDL-c but higher TG levels. Liver fibrosis progressed (p <0.001), in older participants, 128 out of 181 had a variable degree of fibrosis (70.7%), of them, 83 had significant fibrosis ≥ F2 and 15 had F4 (liver cirrhosis). Only 39.6% of patients under 45 years had fibrosis, of them, 30 had significant fibrosis and two had advanced fibrosis (P-value <0.001). Liver fibrosis was comparable in both sexes, younger males showed significantly higher degrees of steatosis and fibrosis, while older females showed more aggressive disease.
Our study had some limitations, we relied on the estimated average age of menopause in Egypt without hormonal assessment. Secondly, despite the efforts to reach different Egyptian governmental areas and cities, they are not equally represented in the study, potentially affecting the generalizability of the findings.
Conclusion: Young females are protected from disease progression despite metabolic risk factors due to their estrogen. However, with aging, rapid progression of liver fibrosis was observed, comparable to the severity observed in males. Aging generally and specifically in females, obesity, and insulin resistance are the main risk factors for advanced fibrosis in MASLD.
Recommendation: MASLD highlights the importance of collaboration among hepatologists, diabetologists, cardiologists, and nutritionists. Public health initiatives are necessary for MASLD prevention and control. Moreover, further larger studies incorporating hormonal profiles for menopausal women are needed.

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PO1.025

Ellagic acid decreases miRNAs and mRNA overexpression involved in Fto, Tnf-Nfkb-Nlrp3 inflammasome pathway in adipose tissue and liver of diet-induced obese rats with Non-Alcoholic Fatty Liver Disease (NAFLD)

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Introduction: NLRP3 inflammasome contributes to the development of inflammation and tissue damage manifested in obesity and NAFLD. Ellagic acid (EA) has been shown to modulate the expression of a wide variety of genes. We focused on analyzing the expression of mRNAs such as Fto, and Tnf-Nfkb1-Nlrp3 and related miRNAs.
Studies in animal models confirm the potential of EA as a therapeutic approach in the inflammatory process. miRNAs can be used as promising biomarkers for multiple diseases, this small non-coding RNA molecule possesses a crucial role in regulating gene expression. FTO has been shown to affect obesity and inflammation. FTO exhibits efficient N6-methyladenosine (m6A) oxidative demethylation activity. Suppression of FTO with RNAi leads to an increase of m6A level in mRNA, whereas overexpression of FTO results in a decrease of m6A level in human cells. FTO suppresses the transcription of many known proinflammatory genes, and this regulation requires its catalytic activity, but it is not through FTO's actions on m6A but through FTO depletion that results in activation of the transcription factor STAT3. Here we propose that EA produces a concomitant inhibition of FTO transcription and the mRNA expression of the Tnf-Nfkb-Nlrp3 Inflammasome pathway and miRNAs associated with this pathway.
Objectives: To evaluate the mRNA expression level of Fto, Tnf-NfkB1-Nlrp3 inflammasome pathway, Stat3 and the expression of related miRNAs by qPCR.
Methodology: Wistar rats were randomly distributed into three groups: standard diet (SD), high-fat diet (HD), and high-fat diet plus ellagic acid (EA), with n=6 for each group. The EA dose of 50 mg/kg per day via intragastrical was administrated.
Retroperitoneal adipose and liver tissue was obtained, isolated total RNA with TriZol methodology, synthesized cDNA and evaluated the expression of the mRNA of Fto, Tnf, Tnfrs1a, Tradd, Ripk1, Map3k7, Tab1, Chuk, Ikbkb, Ikbkg, Nek7, Nfkbia, Rel, RelA, RelB, Nfkb1, Nfkb2, Nlrp3, Pycard, Casp1, Il1b, Il18, Nek7, Gsdmd, Stat3 and miRNAs: miR-16, miR-34, miR-93, miR-129, miR-155 and miR-191 by qPCR.
Results: In adipose tissue and liver of obese rats with NAFLD, ellagic acid reduces the overexpression of Fto and most of the genes of the Tnf-Nfkb-Nlrp3 inflammasome pathway and the associated miRNAs: miR-16, miR-34, miR-93, miR-129, miR-155 and miR-191.
Conclusion: Ellagic Acid possesses anti-inflammatory effects in obese Wistar rat adipose tissue and liver, modulating the mRNA expression of Fto, Tnf-Nfkb-Nlrp3 pathway and related miRNAs.

PO1.026

Association metabolic dysfunction-associated liver disease and obesity with newly diagnosed type 2 diabetes and arterial hypertension

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Introduction: Steatotic liver disease (SLD) is the most common chronic liver disease worldwide, independent of age or race. It is closely linked to obesity (more than 70% of people with metabolic-associated steatohepatitis (MASH) are obese), type 2 diabetes mellitus ((T2DM), approximately 75% of persons with MASH have type 2 diabetes), hyperlipidemia (20-80% of patients with MASH present elevated cholesterol and triglyceride levels), and atherosclerosis. Since metabolic dysfunction is a key feature of metabolic-associated steatotic liver disease (MASLD), the diagnosis requires confirmed hepatic steatosis along with one of the five cardiometabolic risk factors. Early screening for MASLD in persons with obesity or excess weight, with the assessment of liver enzyme levels (alanine aminotransferase [ALT], gamma-glutamyl transpeptidase [GGT], and aspartate aminotransferase [AST]), and evaluation of fibrosis, even at early stages, combined with appropriate treatment and risk factor correction, can help prevent disease progression and complications. These efforts could also mitigate negative socio-economic consequences.
Methods: Thirty-six women aged 24 to 64 years, with body mass indexes (BMI) ranging from 30.5 to 69.8 kg/m², were screened for MASH. These women were scheduled for bariatric surgery and underwent preliminary assessments, including blood tests to determine ALT, AST, and GGT levels, as well as hemoglobin A1c (HbA1c) levels (selection criteria: predominantly elevated ALT, ALT/AST<1, and increased GGT). HbA1c values above 6.5% were used to identify the presence of diabetes mellitus. Liver enzyme levels were measured using colorimetric biochemical analysis, and HbA1c was measured using high-performance liquid chromatography. All patients also were measured, in the seated position, state for blood pressure on the shoulder by a mercury manometer. Steatosis was assessed via ultrasound steatometry.
Results: MASLD was diagnosed in 100% of the patients. MASH was identified in 39% of the women, with steatosis distributed as follows: Steatosis -1 (first degree) in 21%, Steatosis - 2 (second degree) in 50%, and Steatosis - 3 (third degree) in 77.8% of the patients. Among those with blood pressure readings over 140/90 mm Hg, elevated ALT, AST, and GGT levels were found in 11% of cases. HbA1c levels higher than 6.5%, combined with elevated liver enzymes, were noted in 6% of patients. Simultaneous elevation of ALT, AST, GGT, HbA1c, and BP >140/90 mm Hg was observed in 6% of patients.
Conclusion: MASLD was diagnosed in all persons with obesity, regardless of the presence of type 2 diabetes or hypertension. The highest prevalence of MASH was observed in patients with Steatosis - 3 (S3, 77.8%). MASH was more prevalent in persons with obesity and with hypertension (11%) compared to those with obesity and type 2 diabetes (6%), or those with both conditions combined (6%).

Conflict of Interest: None Disclosed

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PO1.027

Natural selection signatures of syndromic and monogenic obesity genes do not support the thrifty genotype hypothesis

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Background: J.V. Neel's thrifty genotype hypothesis was introduced 60-years ago stating that gene variants promoting efficient fat deposition may have been advantaged by natural selection to allow human survival during famine. Nowadays, such genes are rendered detrimental by progress as they promote fat deposition in preparation for a famine that never comes, resulting in widespread obesity. Obesity is genetically heterogeneous, with a continuum between very rare syndromic, rare monogenic, and common polygenic forms of obesity. The identification of natural selection signatures has been largely restricted to polygenic

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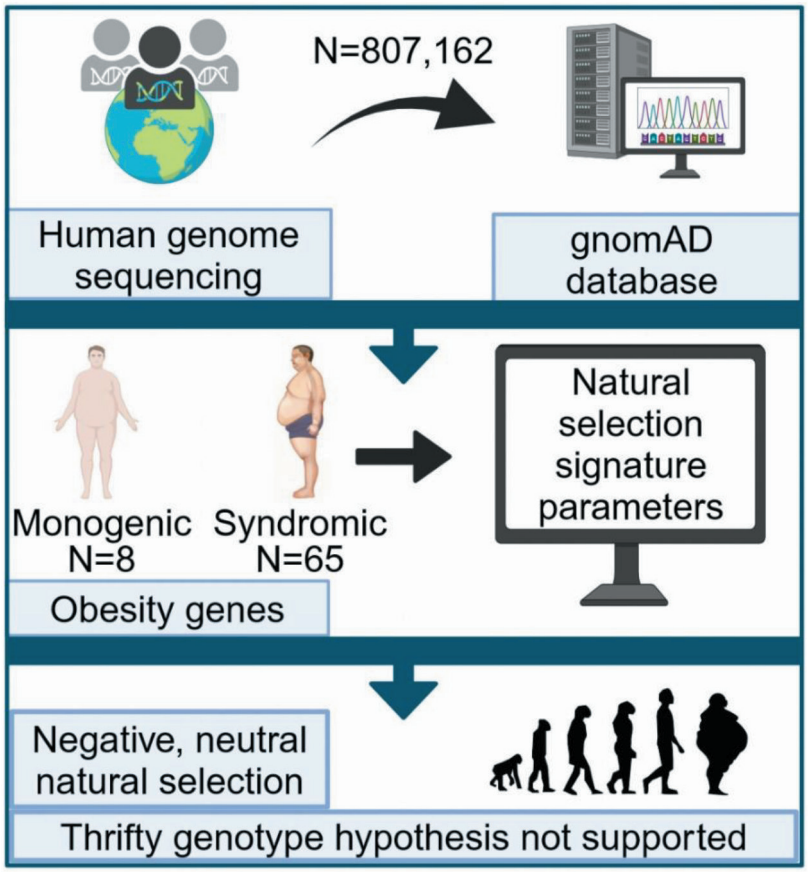


Fig. 1. Graphical abstract.

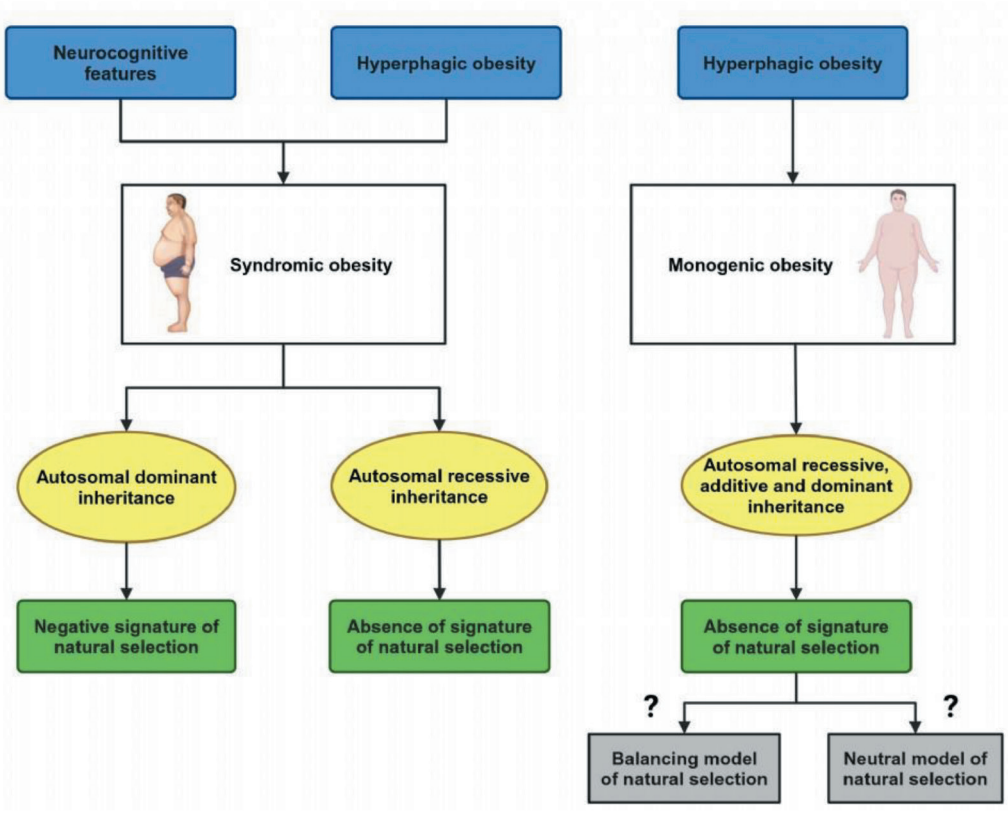


Fig. 2. Overview of the natural selection signatures of syndromic and monogenic obesity genes.

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obesity-susceptibility variants and failing to prove the validity of the thrifty genotype hypothesis. However, polygenic variants may not be as relevant as monogenic mutations characterized by strong phenotypic effects on body mass index variation and obesity risk to detect significant signatures of natural selection. The present study aims to investigate the patterns of natural selection of syndromic and monogenic obesity genes in the gnomAD multiethnic population (N=807,162).
Methods: We investigated the loss-of-function (nonsense, start loss, splice acceptor and donor, frameshift) and missense mutation intolerance patterns of natural selection of 65 syndromic and 8 monogenic obesity genes in 807,162 individuals from seven ethnic groups in the gnomAD database.
Results: Our data suggests that most dominant syndromic obesity genes display negative signatures of natural selection, while monogenic obesity genes exhibit neither negative nor positive patterns of natural selection. Our study does not provide any evidence that syndromic and monogenic forms of hyperphagic obesity support the thrifty genotype hypothesis at the global population level.
Conclusion: Our work provides crucial information to understand the distribution of mutations predisposing to monogenic and syndromic obesity, and their evolution in the future, comprehend why some individuals are susceptible to obesity, and have a deep impact on the therapeutic strategies to manage chronic diseases.

PO1.028

The role of Probiotics in the treatment of Obesity and Prediabetes

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In the last few years, the study of intestinal microflora in patients with prediabetes, obesity and insulin resistance has been of particular importance. Obesity and its associated diseases are still one of the leading causes of disability and death. The human gastrointestinal tract is a complex ecosystem consisting of host cells, intestinal microflora and nutrients.
The aim of our study was to study the microbiome of patients with insulin resistance and to observe the change in Homa index based on its correction using probiotics. Based on our research, we can conclude that the long-term inclusion of probiotics in the treatment of patients with insulin resistance for 12 weeks with the following combination: Lactobacillus rhamnosus-1.0x10*9, Lactobacillus casei-1.0x10*9, Lactobacillus acidophilus-1.0x10*9, Bifidobacterium bifidum- 1.0x10*9) 6 caps. per day, significantly reduces dyspeptic symptoms, at the expense of loss of appetite and weight loss, reduces body mass index. It also helps to reduce the waist circumference, which can probably be explained by the burning of fat deposits deposited by probiotics.
We evaluated the change of the Homa index as a marker of insulin resistance before and after treatment with probiotics. According to the literature [14] insulin resistance decreases under the influence of probiotics, which is confirmed by our work. The reduction of the insulin resistance index is also confirmed by comparing the main and control groups, insulin resistance in the control group increased by 1.32%, which is probably related to the fact that we did not use probiotics in the control group. The average weight in the main group decreased by 2.2%, and in its control group - by 1.36%; Waist circumference: decreased by 4.3% in the main group, increased by 1.4% in the control group.
In patients with insulin resistance, taking probiotics for a long time - at least 12 weeks, reduces the degree of insulin resistance and improves the quality of life.

PO1.029

Branched-chain fatty acids 12-methylmyristic and 13-methylmyristic are altered in patients with severe obesity and MASLD and exert a protective role against lipotoxicity

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Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD), the most prevalent chronic liver disease worldwide, is primarily characterized by a steatotic liver in conjunction with obesity and/or various metabolic dysfunctions, including insulin resistance, type 2 diabetes, and metabolic syndrome. The accumulation of saturated fatty acids (SFAs) in the liver is a hallmark of MASLD, contributing to increased lipotoxicity and insulin resistance in hepatocytes, thereby playing a critical role in the development and progression of the disease. Specifically, SFAs, such as palmitic acid (PA) and myristic acid (MA), have been reported to be altered in patients with obesity and MASLD. However, less is known about other SFA species, such as branched chain fatty acids (BCFAs). Previous studies have described an inverse association between serum BCFAs levels and obesity and insulin resistance. Nevertheless, the contribution of hepatic BCFAs to disease progression, as well as their mechanisms of action in hepatocytes remain to be elucidated.
Methods: The levels of hepatic and serum BCFAs were evaluated in 91 patients with severe obesity using gas chromatography-mass spectrometry. Based on histological findings from liver biopsies, patients were classified as no MASLD (N=26) or MASLD (N=65). The effects of PA, MA, and specific BCFA (13-methylmyristic acid, 13-MMA); 12-methylmyristic acid, 12-MMA) were tested in the human hepatocyte-like cell line HepG2. Cells were co-incubated with PA in the presence or absence of MA, 13-MMA, and 12-MMA. Cell viability was evaluated using the MTT assay, while cytokeratin 18 (CK-18), a marker of hepatocellular damage, was quantified in the supernatants via ELISA. Lipid accumulation was assessed through Oil Red staining.
Results: Our results showed that hepatic BCFAs were significantly altered in patients with MASLD compared to those without MASLD. Furthermore, we found that 12-MMA and 13-methyl-myrisitc acid 13-MMA, two methyl derivatives of MA, were significantly higher in liver samples of patients with MASLD compared to those without MASLD and positively correlated with the histological progression of MASLD. The *in vitro* study showed that while PA incubation reduced cell viability and increased CK-18 production, neither MA nor the BCFAs exhibited cytotoxic effects on HepG2 cells. In PA-treated cells, co-incubation with 13-MMA and 12-MMA, but not MA, improved cell viability and reduced CK-18 levels. Furthermore, treatment with 13-MMA and 12-MMA led to the formation of large lipid droplets, in contrast to PA and MA treatments, which resulted in numerous lipid droplets distributed throughout the cytoplasm.

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Conclusion: Our findings suggest that both 12-MMA and 13-MMA may exert a hepatoprotective effect against PA-induced lipotoxicity in human hepatocyte-like cells, representing promising therapeutic agents for mitigating liver damage in MASLD.

Conflict of Interest: Authors have no conflict of interest to disclose.

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PO1.030

Premature Aging and its Association with Comorbidities in Patients

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Introduction: Biological age (BA) reflects the state of the body based on its physiological changes. BA assesses the degree of aging and may differ from the chronological age (CA). Premature aging is often observed in patients with cardiovascular diseases (CVD), type 2 diabetes (T2D), and others.
Studying the processes of premature aging is a relevant topic in the fields of medicine, gerontology, genetics, as understanding its connection with the degree of patient comorbidity, as well as its mechanisms, will not only help prevent the development of CVD and their complications but also increase the life expectancy of the population.
Objective: To study the relationship between BA and the severity of comorbid conditions in therapeutic patients.
Materials and Methods: 100 patients (62 men and 38 women) were examined in a therapeutic hospital setting. Patients were divided into 5 groups: group 1 - healthy patients, n=13; group 2 - patients with hypertension (HTN), n=30; group 3 - patients with HTN and coronary heart disease (CHD), n=23; group 4 - patients with HTN and T2D, n=20, group 5 - patients with HTN, CHD, T2D, n=14. Analysis of general clinical, laboratory, anthropometric, and instrumental data was conducted. Anthropometric parameters included measurement of body weight, height, hip circumference (HC), waist circumference (WC), and calculation of body mass index (BMI). Calculation of biological age was performed according to patent RU №2387374 C2. The severity of metabolic syndrome was calculated using patent RF №2444298.
Results: Patients in groups 1 and 2 had a rate of aging coefficient (RAC) of 0.97 and 1.0, respectively, which is normal. Patients in groups 3, 4, and 5 had accelerated aging, with their RAC being - 1.13; 1.26; 1.37, respectively. It was found that the difference between CA and BA progressively increased in groups 1 to 5, and was: -0.8; 0.5; 4.4; 9.9; 15 years, respectively. The greatest increase in the rate of aging was observed in individuals from groups 4 and 5, who, in addition to CVD, also had T2D. The frequency of metabolic syndrome (MS) occurrence in groups increased with the number of chronic diseases: in group 1, no patient had MS, in group 2 MS was present in 73.3%, in group 3 in 91.3%, and in groups 4 and 5, MS was present in 100% of patients.
Correlation analysis revealed a negative correlation between BA and CA: ($r = -0.096$; $p > 0.05$), as well as a positive correlation between BA and levels of triglycerides, total cholesterol, and glucose ($rs = 0.365$, $p < 0.05$; $rs = 0.259$, $p < 0.05$; $rs = 0.359$, $p < 0.05$), respectively. A significant correlation was also found between BA and the severity of MS: $rs = 0.621$ ($p < 0.05$).
Conclusion: Thus, a relationship between BA, RAC, and the number of chronic non-infectious diseases has been established, which are based on a range of metabolic disorders considered within the framework of insulin resistance and metabolic syndrome.

PO1.031

Glycemia variability in men with different chronotypes

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Introduction: It has been shown that individual characteristics of circadian rhythms, affecting processes such as sleep and wakefulness, food intake, body temperature, heart rate, hormone secretion, may vary significantly among individuals with different chronotypes. Combined with the action of exogenous factors such as lighting, shift work, physical activity, this may lead to the development of a range of metabolic disorders: obesity, metabolic syndrome, and diabetes.
Objective. To study the features of glycemia variability in men with different chronotypes under conditions of a regular diet.
Materials and methods. The study involved men aged 25 to 65 years, with a total of 43 participants. Based on the analysis of the Horne-Ostberg questionnaire in the modification by Putilov A.A., 3 chronotypes were identified: morning, intermediate, and evening. Group 1 (n=22) consisted of men with a morning chronotype, group 2 (n=11) - with an intermediate chronotype, and group 3 (n=11) - with an evening chronotype. A 2-day continuous glucose monitoring was conducted, with no changes in diet, physical activity, or work routine compared to usual. Parameters, indexes, and ratios characterizing glycemia variability were analyzed for daytime (6:00-23:59) and nighttime (0:00-5:59) hours.
Results: Analysis of parameters and indexes characterizing glycemia variability showed that significant differences were found only in the HBGI index between men with morning and evening chronotypes during the daytime observation period, indicating a risk of hyperglycemia. Men with morning and evening chronotypes differed significantly from those with intermediate chronotype in many parameters and indexes. Overall, men with an intermediate chronotype had a significantly lower average glucose level and coefficient of variation throughout the day and night. Significant differences were also found in terms of the CONGA index, reflecting the magnitude of dispersion, and the J-index, which was higher in men with an evening chronotype. Regarding LBGI and HBGI indexes reflecting the risks of hypoglycemia and hyperglycemia development, it has been shown that the LBGI index was higher in men with an intermediate chronotype, while the HBGI index was higher in men with an evening chronotype. Nighttime glucose levels and indexes characterizing glycemic variability also showed statistically significant differences between the group with an intermediate chronotype and the groups with morning and evening chronotypes in the following parameters: average glucose level, SD, CV, LI, CONGA index, J-index, LBGI, and HBGI indexes. Men with an intermediate chronotype had a higher risk of developing hypoglycemic conditions, while individuals with morning and evening chronotypes were more prone to developing hyperglycemic conditions.
Conclusion: Thus, it has been shown that the circadian features of hormonal regulation of carbohydrate metabolism affect glycemic variability, both during the day and at night, with the most pronounced disturbances being observed in men with an evening chronotype.

PO1.032

Consumption of high-fat diet impairs the cholinergic anti-inflammatory system and tight junctions proteins in dextran sulfate sodium (DSS)-induced colitis in mice

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Introduction: Inflammatory bowel diseases (IBD), such as ulcerative colitis and Crohn's disease, have high prevalence and morbidity worldwide. IBD is characterized by the presence of cytokines and cell infiltrates, as well as impaired intestinal permeability. Despite its multifactorial causes,

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nutrition appears to play a significant role in the management of IBD. Activation of the α7 nicotinic cholinergic receptor (α7nAChR) and the JAK-STAT3 pathway can reduce the expression of proinflammatory cytokines, thereby mitigating IBD symptoms. However, our previous studies have shown that short-term consumption of a high-fat diet (HFD) can decrease α7nAChR content in the hypothalamus, adipose tissue, and immune cells.

Objective: We aimed to investigate the effect of HFD consumption on the colonic α7nAChR expression in the evolution of experimental colitis induced by DSS.

Methods: C57BL/6J mice were allocated into control (CT) or HFD (45%) group at the 6th weeks. Diets were offered for 4 weeks. Part of these mice was exposed to DSS (2.5%) added to drinking water for 7 days to induce the colitis. Thus, there were the groups: CT, CT+DSS, HFD, and HFD+DSS. Colitis score was evaluated based on the Disease Activity Index (DAI) parameters. Intestinal permeability was evaluated using FITC-dextran administered by gavage and quantified in the serum 4h later. In addition, α7nAChR knockout mice (KOα7) (n=5/group) were divided into CT or HFD (45% kcal/lipids) group from the 6th to the 10th week-of-life. Colon tissue and isolated colonic epithelial cells (IEC) were collected for Western blotting and qPCR analyses. Proteins and genes related to cell junction and α7nAChR were evaluated. CEUA No.: 5751-1/2021 and 5386-1/2019.

Results: The CT+DSS group exhibited a higher DAI on the 4th and 7th days, along with greater body weight loss compared to the HFD group. Colon length was reduced in both groups (HFD and CT+DSS) compared to the CT group, and in the HFD+DSS compared to the HFD. In colonic epithelial cells from the HFD mice, there was a reduction in the expression of the Tjp1, Occludin, Tnfa, and Chrna7 genes compared to the CT group. Additionally, HFD consumption led to a decrease in the protein levels of α7nAChR, Claudin1, Claudin2, and Occludin when compared to the CT group. HFD+DSS had a reduction in ZO1 protein content compared to CT+DSS. The intestinal permeability in the HFD+DSS was higher than CT+DSS and HFD groups. KOα7mice were used to investigate the role of α7nAChR in colon protection. KOα7 mice presented higher expression of TNFa and IL1B compared to wild-type mice. When were fed a HFD displayed a shorter colon and reduced Claudin2 protein levels, along with decreased expression of the Claudin4 and Tjp1 genes, compared to WT mice.

Conclusion: Thus, HFD consumption shortens the colon independently of colitis but exacerbates intestinal permeability in animals with colitis. The reduction of the α7nAChR receptor may potentiate an inflammatory response in both groups exposed to HFD.

PO1.033

Tirzepatide and acute exercise have synergistic effects on NAFLD by anti-inflammation

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Objectives: We aimed to investigate the independent and synergistic effect of two of these metabolic interventions, acute exercise and the GLP-1/GIP agonist (Tirzepatide) on fatty liver and other metabolic biomarkers in the high-fat diet mice.

Methods: We used high-fat diet (HFD; 12 weeks) fed male C57BL/6 mice. We divided into four groups (exercise /Tizepatide, non-exercise/ Tirzepatide, exercise/saline, and non-exercise/ Tirzepatide, n=3/group). At both the beginning and end of the experiment, the mice were observed via metabolic cage to develop a profile of activity and metabolism. Daily body weight was also measured, and plasma samples were obtained. At the end, abdominal ultrasound was performed, relevant tissues were harvested, and protein multiplex analysis and metabolite analysis were performed.

Results: Acute exercise only for 7days doesn't affect weight change, but once injection of Tirzepatide affects significant weight loss in our study. There were no differences in the energy expenditure rate and respiratory exchange ratio (week 2) between the four groups. Our study showed a statistically significant decrease of 65% ($p < 0.001$) in ALT (60 U/L, $p < 0.05$) after the once injection of Tirzepatide and 7 days of acute exercise. Analysis of serum inflammatory markers showed a decrease in TNF-α levels of 43% (3pg/ml) in the Tirzepatide/exercise group as compared to control group mice ($p < 0.05$). Tirzepatide/acute exercise group had a trending 10% reduction in liver fattiness (measured by brightness), but no statistical significance in the ultrasonography at the end of the study as compared to control group.

Conclusion: Our study showed the significant decreases in serum ALT level and serum TNF-α level after the once injection of Tirzepatide and 7 days of acute exercise in the high-fat diet mice. Synergistic intervention with Tirzepatide and acute exercise, likely mediated by their anti-inflammatory effects, appears to be an effective therapy against fatty liver.

PO1.034

Device-measured physical activity and sedentary time are associated with brain responses to visual food cues in adults

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Self-reported physical activity is associated with lower brain responses to food cues in reward-related regions such as the orbitofrontal cortex (OFC) and insula. However, these associations have not been examined using objective measurements of physical activity. Functional magnetic resonance imaging (fMRI) was used in this cross-sectional study to examine the neural response to visual food cues in relation to device-measured moderate-to-vigorous intensity physical activity (MVPA) and sedentary time. A total of 51 healthy adults (30 men, 21 women; mean ± SD: age 26 ± 6 years; body mass index (BMI) 24.1 ± 3.0 kg/m2) had fMRI scans after an overnight fast while viewing images of high/very high-energy density foods (HED; 3.11-7.41 kcal/g), very low/low-energy density foods (LED; 0.09-1.40 kcal/g) and non-food objects. ActiGraph wGT3X-BT (Pensacola, Florida USA) and activPAL4 (PAL Technologies Ltd, Glasgow,

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UK) accelerometers were used to measure free-living MVPA and sedentary time, respectively, for seven consecutive days. The association of movement behaviours with brain food cue reactivity was assessed in regression models that controlled for physiological and behavioural variables using the fMRI Expert Analysis Tool (FEAT) in FMRIB's Software Library (FSL). Interaction terms were subsequently added to explore the moderating influence of sex, age and BMI. Participants spent, on average, 77 ± 37 mins/day engaged in MVPA and 578 ± 83 mins/day sedentary. After adjusting for age, sex, BMI and device wear time, a negative association was identified between MVPA and reactivity to LED compared with non-food cues in the precentral gyrus, hippocampus, posterior insula and amygdala, which may indicate lower inhibitory responses to the intake of LED foods. Time spent in MVPA was positively associated with reactivity to LED versus non-food cues in the dorsal striatum, which has been linked to food motivation. Sedentary time was positively associated with reactivity to HED vs non-food cues in the dorsal division of the posterior cingulate gyrus which has been implicated in attention allocation. The strength of the associations was not moderated by age, sex or BMI. In conclusion, the brain-behaviour relationships identified in this study suggest that MVPA may enhance the appeal of and desire to consume LED foods whilst greater time spent sedentary may promote attention towards HED foods. These findings may support a role for greater physical activity and lower sedentary time to positively influence hedonic aspects of appetite and eating behaviour.

PO1.035

An ALK7 siRNA developed by SiranBio adipose delivery platform showed excellent activity and safety profile in pre-clinical studies

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Introduction & Objective: ALK7 (ACVR1C) belongs to TGF-β type I receptor and is highly expressed in white and brown adipose tissue. Inhibition of ALK7 can play a role in promoting lipolysis and maintaining lean body mass. The aim of this study is to introduce the adipose delivery platform and an ALK7 siRNA developed by SiranBio.

Methods: SOD1 and ALK7 gene were used for adipose delivery platform validation. The conjugated SOD1 and ALK7 compounds were injected with a single dose from 1mpk to 5mpk to test the activity in C57 mice or cynomolgus monkeys. Also, the safety of the conjugated compound with 100 mpk dosage was evaluated in rats. The pharmacodynamic and pharmacokinetics studies are ongoing.

Results: A dual conjugation strategy was used for adipose delivery platform, with conjugating a lipid delivery unit to enhance targeting and a PK modulating unit to enhance efficacy. The ALK7 mRNA was shown over 80% inhibition at Day 14 and could last to the end of study at Day 85 in 3 mpk in cynomolgus monkeys.

By ALK7 sequence screening and activity screening with conjugated compounds, several compounds indicated encouraging silencing effect and a ALK7 siRNA compound as a leading candidate was selected for further studies. The ALK7 mRNA remaining was 23.8% in iWAT (inguinal white adipose tissue) and 38.3% in pgWAT (perigonadal white adipose tissue) at Day 13 in C57 mice with 5mpk and 8.6% at Day 14 in cynomolgus monkeys with 3mpk subcutaneously.

No significant abnormalities in body weight, blood routine, blood biochemistry, and pathological anatomy were indicated in rat toxicological studies.

Conclusion: SiranBio has established its adipose delivery platform and utilized it for ALK7 siRNA development. The ALK7 mRNA inhibition was potent and the safety profile was good. These results support further development of ALK7 siRNA to clinical stage.

PO1.036

The Clinical utility of polygenic risk scores: insights from an obesity cohort

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Introduction: Polygenic risk scores (PRS) show promise for estimating an individual's genetic predisposition to obesity, but their clinical use is unclear due to limited studies. In patients referred to our clinical genetics' clinic, we found that common genetic variants (e.g. an unfavorable PRS) can explain the obesity phenotype when no causative monogenic defect is identified.

Objective: We here investigate whether suspected genetic obesity can be (partially) explained by high polygenic risk scores (PRS), and whether PRS can assist in identifying patients with a high probability of monogenic forms of obesity.

Methods: We evaluated PRS utility and predictive value in real-world clinical data of patients with suspected rare genetic obesity (n=141). PRS were compared to the Dutch general population controls (GoNL, n=498). BMI PRS were calculated from clinical SNP array data, based on the largest BMI GWAS (N=681,275).

Results: BMI PRS were significantly higher in the clinical obesity cohort compared to controls (P<0.001), indicating strong polygenic contributions to obesity in patients clinically referred for suspected genetic obesity. We observed significantly lower PRS in patients with confirmed monogenic obesity compared to those without (P<0.05). PRS predicted monogenic obesity status moderately well (AUC=0.69).

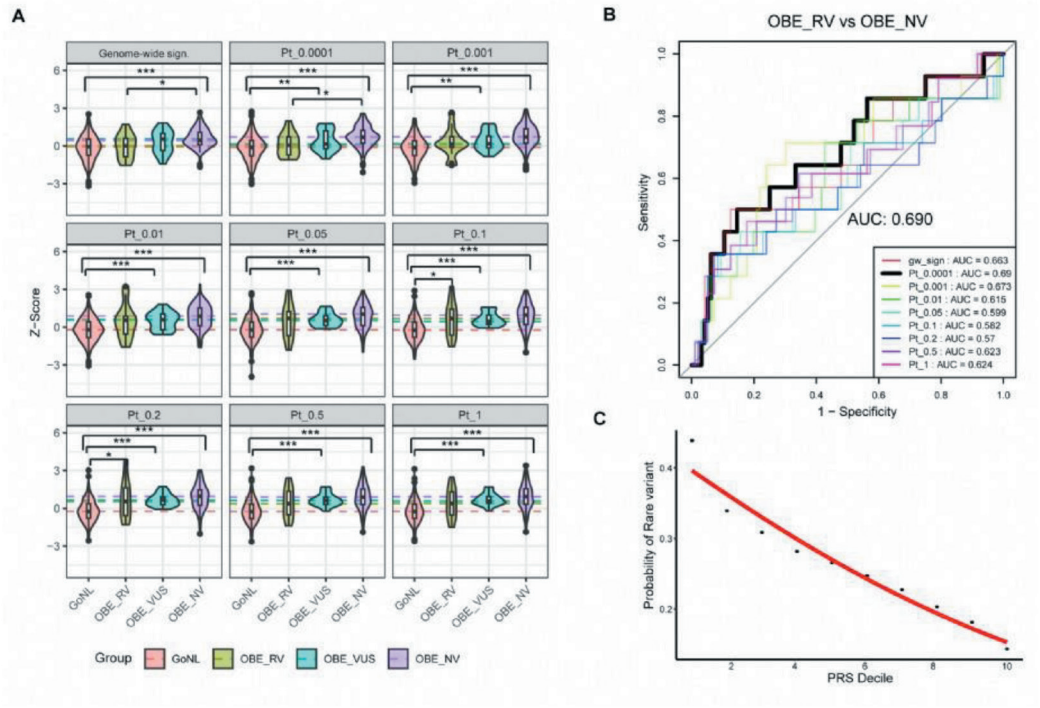
Conclusions: PRS can help explain obesity in a substantial proportion of patients suspected of genetic obesity and aids in identifying patients with high likelihood of carrying a rare pathogenic variant. We here show potential clinical utility of PRS in genetic obesity diagnostics.

1 Medical ethical statement: This study is approved by a medical ethical committee (Amsterdam UMC, MEC number: W22_467). Consent was obtained from all included participants.

Conflict of Interest: All authors declare no conflict of interest

Funding: This research did not receive any specific grant from any funding agency in the public, commercial or not-for-profit sector.

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A. Violin plot of z-scored BMI polygenic risk scores (PRS) of controls, OBE_RV (OBE subgroup with rare gene variant), OBE_VUS (OBE subgroup with variants of uncertain significance) and OBE_NV (OBE subgroup with no rare gene variants). *= -value <0.05, **=p-value <0.01, ***=p-value <0.001. Dotted lines represent the group median PRS. B. Receiver Operating Characteristic (ROC) curves for different PRS thresholds of the predictive power for OBE_RV and OBE_NV. C. Probability of rare variant based on decile BMI PRS of PT<5e-8 (genome-wide significant), as calculated by a generalized linear model. gw_sign, genome-wide significant threshold;

Fig. 1. PRS analysis of OBE subgroups.

PO1.037

Sex Differences in Catecholamine Induced Fat Cell Lipolysis

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Introduction: Women store and mobilize lipids more efficiently than men, which is important for sex differences in adipose mass. This includes increased lipolytic response to catecholamine activation in women, but the cellular nature of this dimorphism is not known.
Methods: In a large cross sectional study lipolysis (hydrolysis of the triglycerides) in isolated abdominal subcutaneous fat cells was measured in adult women (n=774) and men (n=298). The cells were incubated in the absence (basal) or presence of increasing concentrations of the following agents acting though cyclic AMP: noradrenaline (natural hormone), isoprenaline (non-selective lipolytic beta-adrenoceptor agonist), dobutamine (selective lipolytic beta-1 adrenoceptor agonist), terbutaline (selective beta-2 adrenoceptor agonist), clonidine (selective antilipolytic alpha-2A adrenoceptor agonist), forskolin (selective lipolytic stimulator of adenylyl cyclase) and dibutyl cyclic AMP (phosphodiesterase resistant lipolytic cyclic AMP analogue which stimulates protein kinase A). Glycerol release was used as lipolysis measure. Concentration response curves were evaluated for half maximum effective concentration (sensitivity) reflecting adrenergic receptor function and coupling to G-proteins as well as maximum effect reflecting post receptor action (adenylyl cyclase, protein kinase A, lipases and their modifiers). Groups were compared by unpaired t-test or analysis of covariance.
Results: Noradrenaline lipolytic sensitivity was 50% decreased (p=0.035) but the maximum lipolytic effect was 50% increased (p<0.0001) in women compared to men, which was independent of cofactors (body mass index, total body fat, age, waist-to-hip ratio, cardiometabolic disease, physical activity, nicotine use). Clonidine antilipolytic sensitivity was 10-fold decreased (p<0.0001) but its maximum antilipolytic action was similar in women versus men. The lipolytic sensitivity of terbutaline and dobutamine was similar between the sexes but their maximum lipolytic action was 35% higher in women than men (p=0.018). The maximum lipolytic effects of isoprenaline, forskolin and dibutyryl cyclic AMP were 20-50 % higher in women than men (p= 0.04 or better). There was no sex difference in lipolysis in the absence of a lipolysis acting agent (basal).
Conclusion: There are marked and complex sex differences regarding catecholamine stimulated lipolysis in subcutaneous fat cells. The lipolytic sensitivity is 50% decreased in women because of increased function and/or coupling to Gi-protein of alpha-2A adrenoceptors. However, the beta adrenoceptor mediated maximum lipolytic action of the hormones is 50% enhanced in women owing to increased ability of cyclic AMP to activate lipolysis at the level of protein kinase A or below (i.e. lipases and their modifiers).

PO1.038

Target tissue specific insulin resistance in patients with juvenile or adult onset obesity

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Introduction: Insulin resistance is well documented in patients with excess body fat, but it is unclear which of the target tissues that are involved or if the age of overweight/obesity onset is of importance.
Methods: In a large cross sectional study insulin resistance was measured in skeletal muscle (hyperinsulinemic euglycemic clamp; n=374), liver (HOMA-IR; n=575), adipose tissue (Adipo-IR; n=574) and isolated abdominal subcutaneous fat cells (insulin stimulated lipogenesis; n=79).

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Body mass index (kg/m2) was measured at examination in adult age and information about the level at 18 years of age was obtained. Based on these measures the patients were subdivided into those with no obesity/overweight (NO), onset of overweight/obesity before 18 years of age (EO) and onset at present adult examination only (LO). A cut-of value of 25 kg/m2 in BMI was used to define overweight/obesity. Age (mean±SD) at examination was 47±11 years. The three groups were initially compared by analysis of variance and EO was subsequently compared with LO using unpaired t-test.

Results: For all four measures EO and LO were significantly altered showing impaired insulin function as compared with NO (F=7-63; p ≤0.0008). For all four measures there was no difference between EO and LO (p=0.32-0.99). Similar results were obtained if men and women were analyzed separately or if younger (<40 years of age) or older (>50 years of age) patients were examined.

Conclusion: Insulin resistance among subjects with overweight or obesity is present in all major target tissues and not influenced by the time of onset of excess body fat.

PO1.039

Alterations in intestinal permeability and integrity markers in the offspring of dams consuming a high-fat diet are dependent of the alpha-7 nicotinic acetylcholine receptor

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Introduction: Obesity is increasingly impacting pregnant women, and the maternal obesogenic environment can lead to augmented inflammation and placental lipid transport, resulting in intestinal dysbiosis in offspring. Evidence in the literature suggests that intestinal dysbiosis plays a crucial role in the development of obesity and diseases associated with metabolic syndrome, partly due to alterations in intestinal permeability. The alpha-7 nicotinic acetylcholine receptor (α7nAChR) acts as an ionotropic and metabotropic receptor that facilitates brain-gut communication. Studies have linked this receptor to a reduction in intestinal pro-inflammatory cytokine levels. The main of the study was to investigate the role of the α7nAChR in inflammation, permeability, and intestinal barrier integrity in the offspring of obese dams.

Methods: Female C57BL/6 mice, aged 5 weeks, were fed either a control diet (10% fat) or a high-fat diet (HFD, 45% fat) for an 8-week adaptation period, mated with same-age control males and maintained in the same diet during pregnancy and lactation. Following euthanasia, molecular analyses (qPCR and Western Blot) were performed on small intestine of embryonic offspring (e20) to evaluate α7nAChR expression, inflammation markers and indirect indicators of intestinal integrity. Additionally, in newly weaned offspring (d28), alongside the previous analyses, we conducted histological assessments, gastrointestinal transit, and intestinal permeability functional assays (FITC-dextran), as well as evaluations of microbiota phylogenetic diversity.

Results: Our results demonstrated an increase in both gene and protein expression of Claudin-1 in HFD-female e20 offspring (2.5-fold) compared to control. In contrast, male offspring of HFD-dams exhibited prolonged gastrointestinal transit time at d28 (137' vs 65'; p<0.01), along with increased intestinal permeability (2-fold), which was not observed in females. The functional changes in HFD-male offspring were accompanied by morphological alterations (reduction in villus length, mucosal thickness, and goblet cells percentage, compared to control) that may result from modifications in the intestinal microbiota, such as lower abundance of Lactobacillus genera. These changes appeared to be associated with α7nAChR expression, as intestinal gene expression was reduced in HFD-male offspring (3-fold), and both morphological and functional alterations were evident in ChRNA7-/- mice. However, activation of the α7nAChR through the administration of a selective agonist (PNU-282987) in HFD-male offspring did not result in changes to paracellular permeability.

Conclusion: Our findings revealed a sexual dysmorphism in offspring of HFD dams, characterized by a more permeable intestinal barrier in male. This was accompanied by changes in epithelial morphology and mild intestinal dysbiosis, dependently of α7nAChR expression. However, the activation of α7nAChR through selective agonist treatment proved ineffective to protect offspring from disruptions in intestinal barrier integrity.

PO1.040

Abdominal Subcutaneous Adipose Tissue Thickness and the Impact on Disease and Anthropometric Factors

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Introduction: Obesity is widely recognized as a significant global health burden, with the distribution of adipose tissue (AT) playing a crucial role in human metabolism[1]. Magnetic resonance imaging (MRI) has become the standard for quantifying various AT depots, particularly with recent advances in automated segmentation, enabling large-scale measurements such as of abdominal subcutaneous adipose tissue (ASAT). However, automated techniques primarily focus on volumetric measurements and often overlook the morphological, functional, and regional variations of AT in response to specific health conditions.

Methods: In this study, we explored the quantification of 3D ASAT thickness phenotypes from MRI scans. We measure ASAT thickness across all vertices in the 3D ASAT surfaces and identify morphological variations linked to anthropometric traits and clinical conditions such as type-2 diabetes (T2D), hypertension, and dementia. We employed a mass univariate regression mesh analysis[2], assessing associations between ASAT thickness and variables cross-sectionally and longitudinally to investigate whether changes in ASAT thickness occur over a two-and-a-half-year period and whether these changes are associated with clinical traits. Cox proportional hazards models were used to investigate the association of 3D mesh-derived phenotypes with future disease outcomes, incorporating principal component scores to reduce dimensionality.

Results: Results from the cohort of 37,888 participants revealed significant associations between ASAT thickness and anthropometric traits. ASAT thickness was negatively correlated with age in both women and men. The presence of T2D, hypertension, and dementia also demonstrated varying associations with ASAT thickness across genders (Figure 1-2). Longitudinal analysis showed significant changes in body regions such as the lower body and upper chest. In survival analysis, we identified significant associations between variations in ASAT thickness across the hips compared to abdominal fat and the incidence of CVD in women (hazard ratio (HR): 0.90, 95% CI: 0.84-0.97, p=0.021) as well as hypertension in both women and men (HR: 1.10, 95% CI: 1.03-1.21, p=0.013 in women; HR: 0.88, 95% CI: 0.82-0.96, p=0.044 in men) (Figure 3-4).

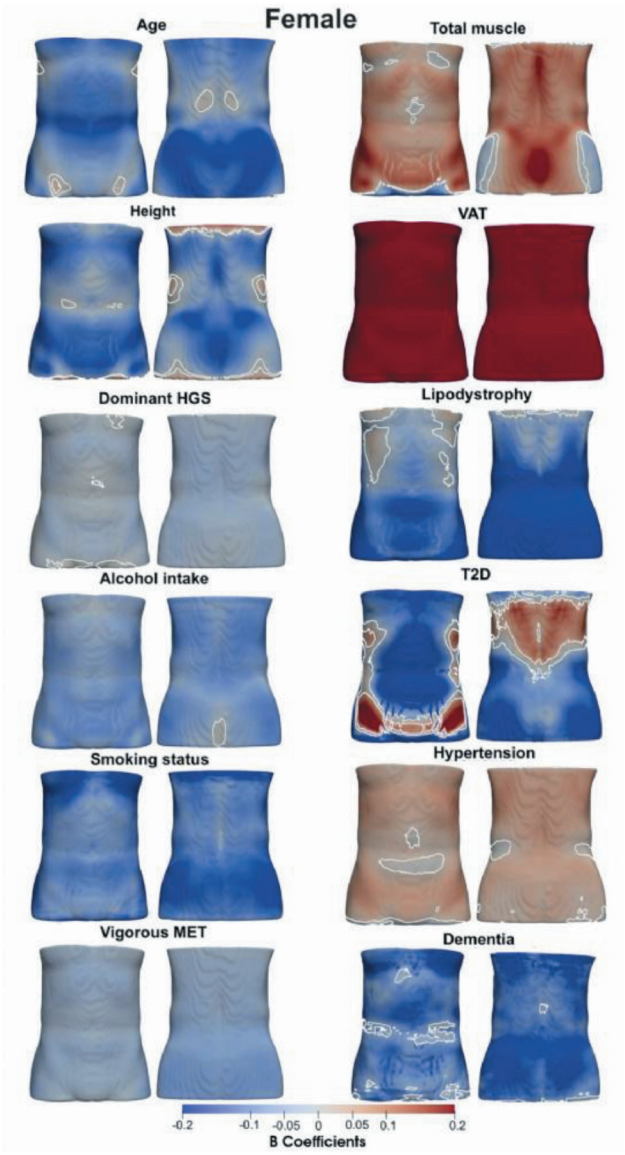
Conclusions: In conclusion, 3D mesh-derived ASAT phenotypes provide a detailed and informative approach to studying adipose tissue morphology, offering insights into its role in disease risk prediction. This method represents a valuable tool for understanding the complex relationship between adipose tissue distribution and metabolic health outcomes, with potential applications in both clinical and population-level research.

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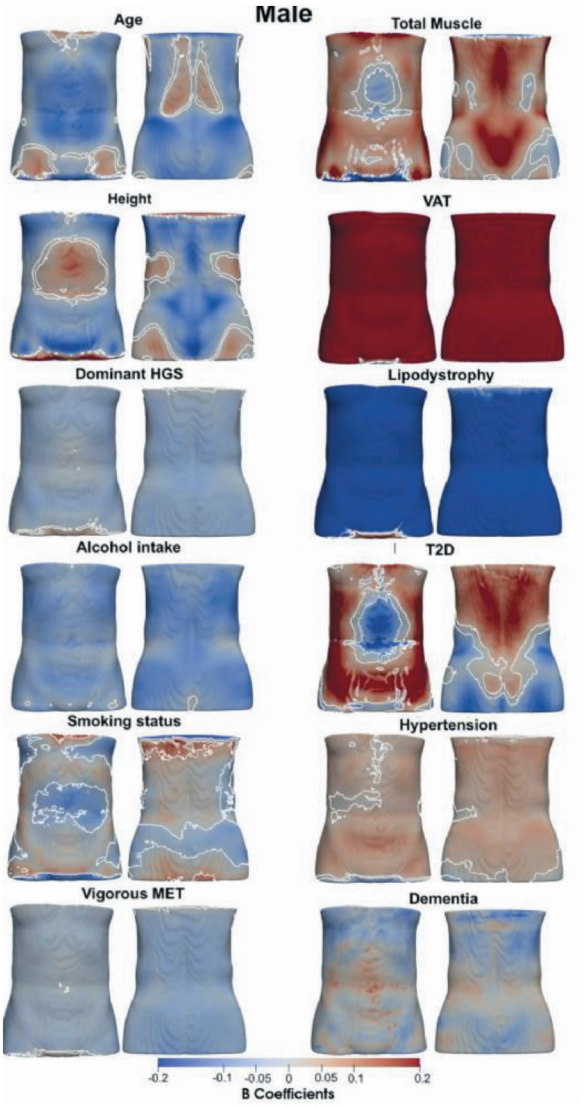
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Three-dimensional statistical parametric maps (SPMs) of ASAT morphology, projections are anterior (left plots) and posterior views (right plots). The SPMs show the local strength of association for each covariate in the model with ASAT thickness for female participants (N=19,456). White contour lines indicate the boundary between statistically significant regions ($p < 0.05$) after correction for multiple testing, with positive associations in bright red and negative associations in bright blue. The standardised regression coefficients () are shown with units in standard deviations for each covariate.

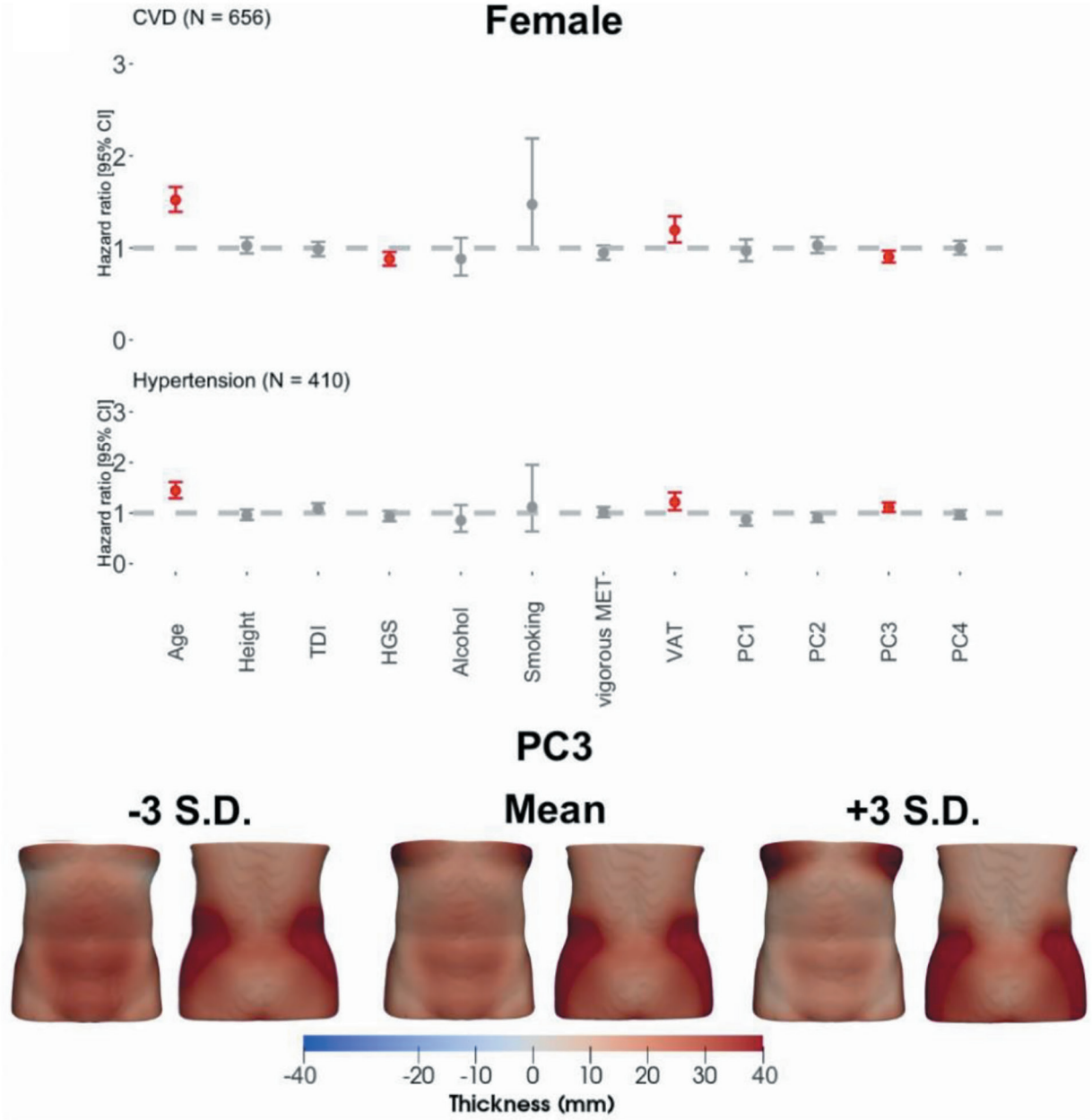
Fig. 1.



Three-dimensional statistical parametric maps (SPMs) of ASAT morphology, projections are anterior (left plots) and posterior views (right plots). The SPMs show the local strength of association for each covariate in the model with ASAT thickness for male participants (N=18,512). White contour lines indicate the boundary between statistically significant regions ($p < 0.05$) after correction for multiple testing, with positive associations in bright red and negative associations in bright blue. The standardised regression coefficients () are shown with units in standard deviations for each covariate.

Fig. 2.

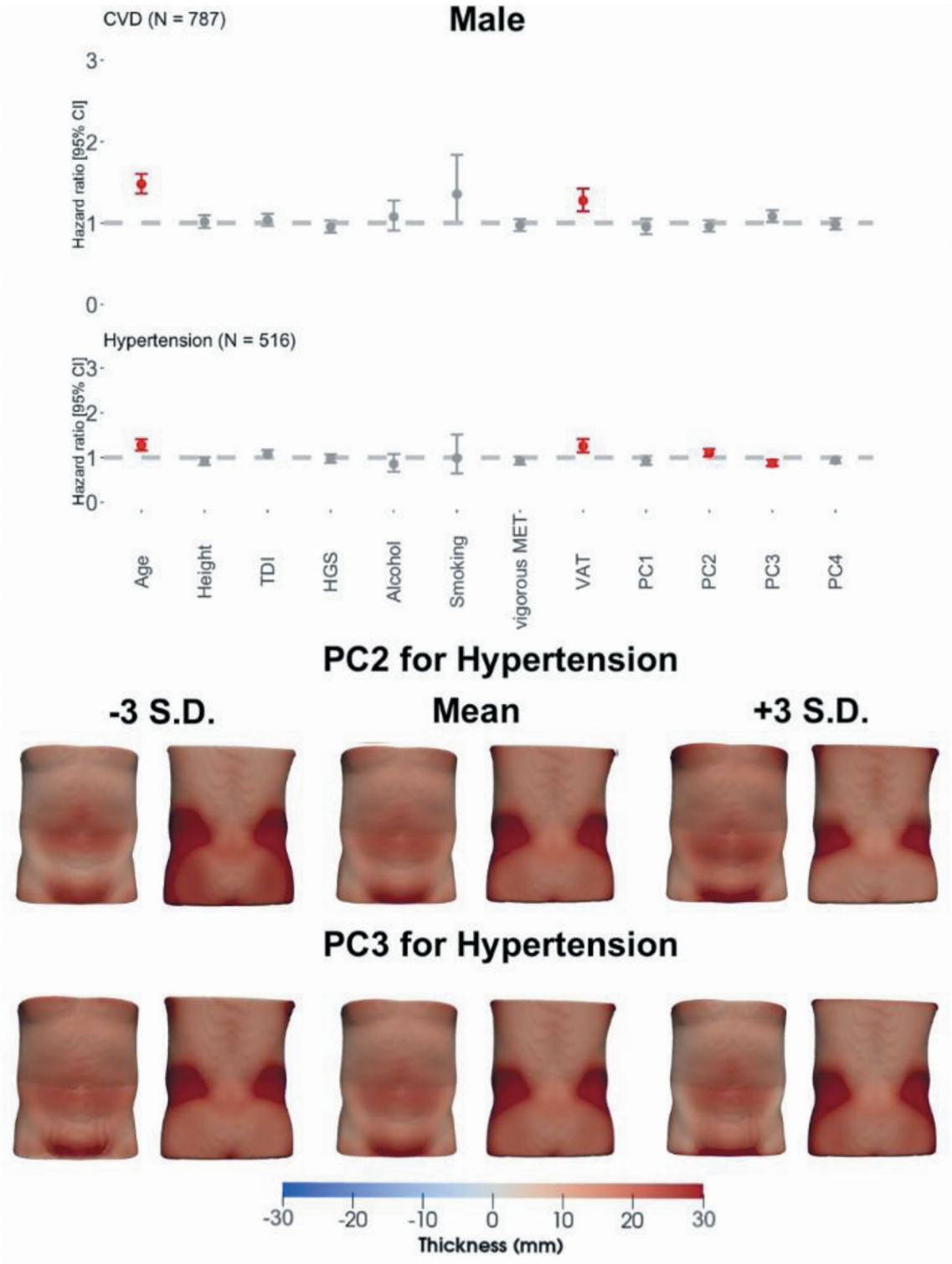
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Hazard ratios and 95% CIs for CVD and hypertension outcomes for the female participants, adjusted for age, ethnicity, height, grip strength in the dominant hand, Townsend deprivation index, alcohol intake frequency, smoking status, vigorous MET, VAT volume, and the first four PC scores of the ASAT thickness. Statistically significant associations ($p < 0.05$) are shown in red. The PCs are visualised below the hazard ratios, showing the minimum and maximum deviations from the average female ASAT thickness mapped onto the average female shape.

Fig. 3.

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Hazard ratios and 95% CIs for CVD and hypertension outcomes for the male participants, adjusted for age, ethnicity, height, grip strength in the dominant hand, Townsend deprivation index, alcohol intake frequency, smoking status, vigorous MET, VAT volume, and the first four PC scores of the ASAT thickness. Statistically significant associations ($p < 0.05$) are shown in red. The PCs are visualised below the hazard ratios, showing the minimum and maximum devi

Fig. 4.

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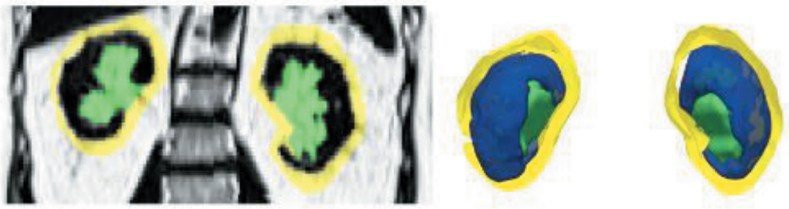
PO1.041

Kidney Adiposity and Health: Insights from MRI-derived Fat Measures at a Population Scale

Thanaj, M.[1]; *Basty, N.*[1]; *Lovegrove, C.*[2]; *Howels, S.*[2]; *Whitcher, B.*[1]; *Bell, J. D.*[1]; *Louise Thomas, E.*[1]

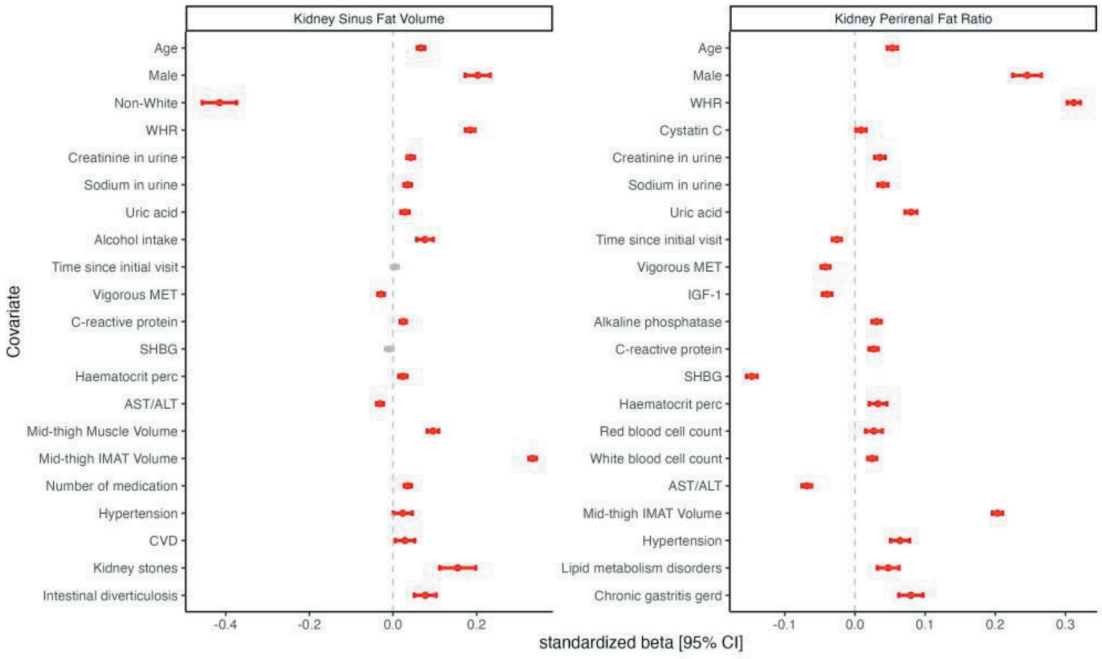
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Introduction: Kidney adiposity, including renal sinus fat (RSF) and perirenal fat, has emerged as a key indicator of metabolic and renal health[1]. Leveraging advanced magnetic resonance imaging (MRI), we examined kidney adiposity in 53,526 UK Biobank participants, focusing on its associations with demographic, biochemical, and health-related factors.
Methods: We utilized existing 3D MRI visceral adipose tissue (VAT) and kidney segmentations[2] to extract detailed measures of kidney adiposity. Binary dilation was applied to kidney segmentation masks to define a perirenal shell, and perirenal fat ratio (PRFR) was calculated as the ratio between adipose tissue volume inside the shell and the shell volume. RSF was derived from adipose tissue within the kidney mask (Figure 1). Stability selection applying Least Absolute Shrinkage and Selection Operator (LASSO) Regression was used for model selection to analyze determinants of RSF and PRFR, focusing on demographics, anthropometric, biochemical markers, lifestyle factors, mid-thigh muscle and fat MRI measures, and pre-existing diseases. Cox proportional hazards models were used to investigate the association of RSF and PRFR with the incidence of diseases with high prevalence, including kidney stones, lipid metabolism disorders, and intestinal diverticulosis. Longitudinal changes in kidney adiposity measures were also evaluated in 3,455 participants with repeat imaging.
Results: All kidney adiposity measures were positively associated with age, waist-to-hip ratio, creatinine and sodium levels in urine, uric acid, hematocrit and mid-thigh fat volume. RSF was further associated with history of kidney stones, hypertension and presence of intestinal diverticulosis while PRFR was associated with hypertension and lipid metabolism disorders. Both RSF and PRFR were negatively associated with physical activity (Figure 2). RSF was significantly associated with increased risk of



Example of perirenal fat (yellow) and renal sinus fat (green) segmentation on T1 Dixon fat image.

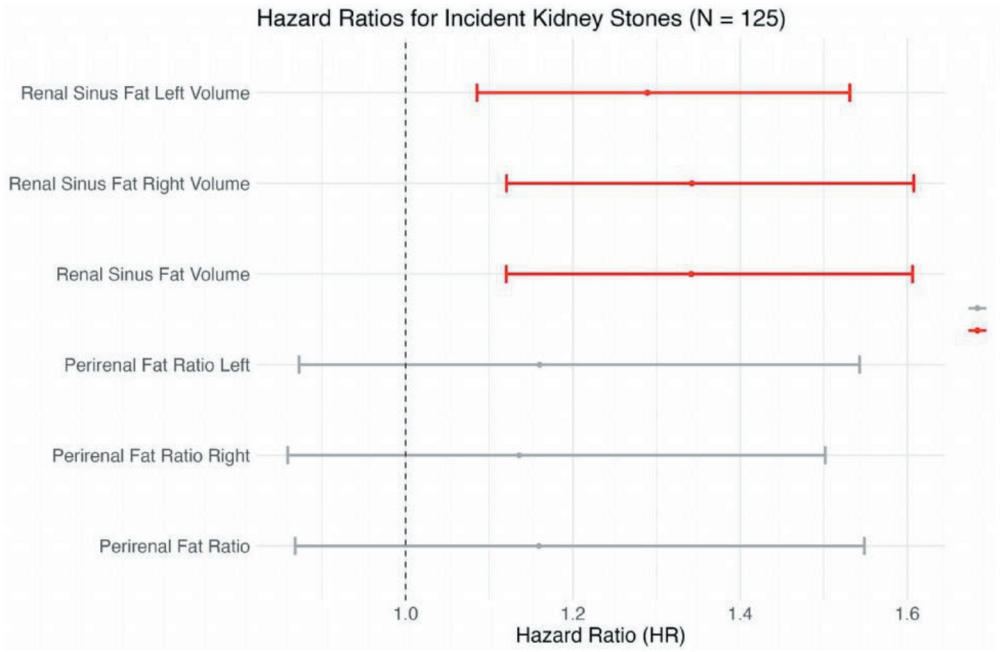
Fig. 1.



Summary of linear regression coefficients for renal sinus fat and perirenal fat ratio, representing the associations with the most relevant variables identified with stability selection applying LASSO. Significant associations for $p < 0.05$ are shown in red and non-significant associations in grey. Abbreviations: WHR: waist-to-hip ratio, MET: Metabolic equivalent task, IGF-1: Insulin-like growth factor 1, SHBG: Sex hormone binding globulin, AST: aspartate aminotransferase, ALT: alanine aminotransferase, IMAT: intermuscular adipose tissue. CVD: cardiovascular disease.

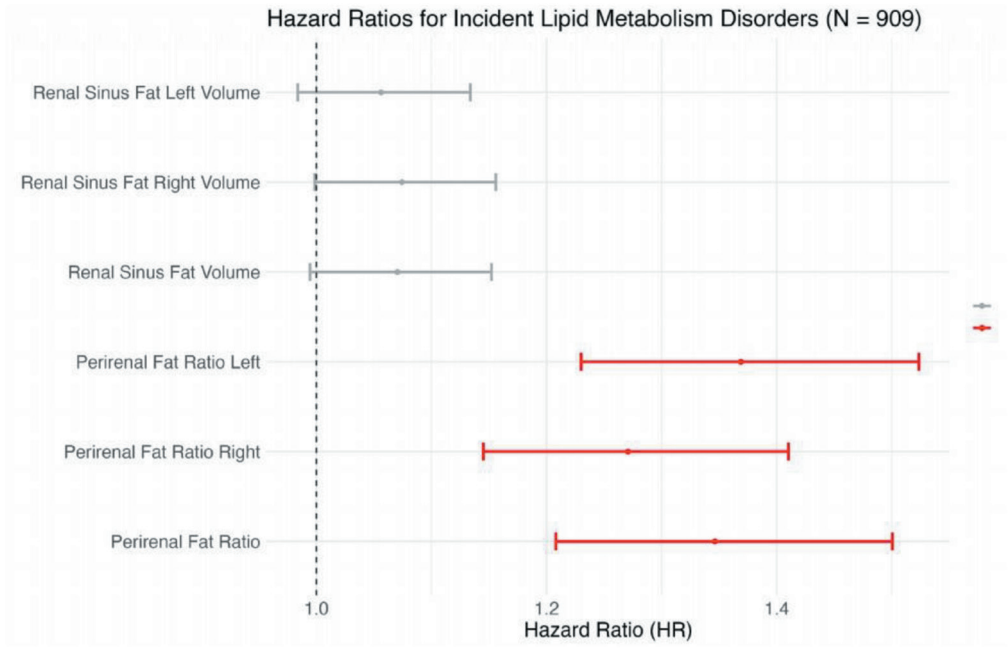
Fig. 2.

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Hazard ratios for incident kidney stone disease in participants with renal sinus fat and perirenal fat ratio data in the UK Biobank. Significant associations for $p < 0.05$ are shown in red and non-significant associations in grey.

Fig. 3.



Hazard ratios for incident lipid metabolism disorders in participants with renal sinus fat and perirenal fat ratio data in the UK Biobank. Significant associations for $p < 0.05$ are shown in red and non-significant associations in grey.

Fig. 4.

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kidney stones (HR = 1.34, 95% CI: 1.12-1.61 for total kidneys, p < 0.05) while PRFR was associated with increased risk of lipid metabolism disorders (HR = 1.35, 95% CI: 1.21-1.50 for total kidneys, p < 0.05) (Figure 3-4). Longitudinal analysis showed a significant increase in both RSF and PRFR at the second imaging visit.

Conclusions: Our findings highlight the utility of MRI-derived kidney adiposity metrics in characterising renal and systemic health. RSF and PRFR independently predicted adverse health outcomes, emphasizing their potential as biomarkers for disease risk stratification. The longitudinal changes underscore the dynamic nature of kidney adiposity and its responsiveness to metabolic and lifestyle factors.

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PO1.042

Lymphocytic phenotyping "CD4 &CD8" mapping the immune interplay of obesity, and MASLD severity

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Introduction: Obesity and metabolic dysfunction associated steatotic liver disease "MASLD" now affects more than one fourth of the world's population. Due to great susceptibility of CD4+ T cells for lip-toxicity, hepatic microenvironment with excessive fatty acid can lead to aberrant accumulation of reactive oxygen species (ROS) and consequent selective loss of intra-hepatic CD4+ T cell (especially Treg cells). NK cells and CD8+ T cells were found to participate in not only metabolic dysregulations such as insulin resistance and hepatic steatosis, but also tissue injury and inflammation during steato-hepatitis progression.

Our aim of work was to correlate the serum level of CD4 and CD8 with the degree of liver fibrosis among participants living with obesity and MASLD.

Patients and Methods: This were a cross sectional analytic study, 82 MASLD participants (18-60 years) were enrolled from 2 national faculty outpatient clinics (Mansoura and Cairo). All participants were subjected to anthropometric measurements (BMI, and waist circumference), liver biochemistry (total bilirubin, AST, ALT and GGT), HCV, HBV&HIV, lipid profile, HbA1c, TSH and serum soluble CD4 (sCD4) & CD8 (sCD8) by ELISA. Abdominal Ultrasonography was done for preliminary diagnosis of liver steatosis then was confirmed by VCTE examination for assessment of liver stiffness measurements (LSM), and hepatic steatosis was evaluated by controlled attenuation parameter (CAP score).

Results: It was found that both s CD4 and s CD8 were correlated significantly to age, BMI, total serum cholesterol and serum triglycerides P<0.05. Additionally, both are higher in males but only sCD4 shows a statistically significant result p = 0.04, Serum CD4 can differ between MASLD without fibrosis & with significant fibrosis at the cut off 3.25 (ng/ml) with AUC 0.94(0.88-1.0), P<0.001, with sensitivity of 90% and specificity 90.4 %. while serum s CD8 exhibit AUC 0.88(0.80-0.96),P<0.001 at the cut off 26.5(ng/ml), with sensitivity 80 %, and specificity 80.8%.They can even help in differentiating between cases with significant liver fibrosis and those with advanced fibrosis by LSM;CD4 at the cut off 33.5(ng/ml) forms sensitivity 75%, and specificity 9.2%, while CD8 at 169.5(ng/ml) cut off has sensitivity 75%, specificity 92.5% (P<0.001).

In conclusion, serum level of CD4 and CD8 are correlating significantly with the degree of liver fibrosis among obese participants with MASLD, with significant positive correlation with BMI, expressing sex preferences' With higher level in males Confirming the role of Lymphocytic phenotyping. Recommendation: Understanding the qualitative and quantitative changes in immune cells including CD4 & CD8 will undoubtedly aid in clarifying the mechanisms by which obesity causes a variety of diseases, including lifestyle-related ones, through excessive local or systemic immune activation. In the future, targeted therapy techniques based on an understanding of immune cell characteristic changes could help to improve the prognosis of MASLD-related disorders.

PO1.043

Bioelectrical impedance analysis and physical perfomance in older Icelandic adults

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Background-Aim: Phase angle (PA) is derived from BIA measurements and reflects the integrity of cell membranes. Higher PA values are associated with better cell health and function. The aim of the study was to investigate associations between PA, muscular strength and physical funtion in older adults.

Methods: A cross-sectional study was conducted in 73 community dwelling older adults (65.8% women, 82±6 yrears) who frequently used day-care services provided by the nursing homes in Reykjavik, Iceland. Bioelectrical Impedance Analysis (BIA) was used to measure body composition. Handgrip strength was tested as well as the short physical performance battery (SPPB) protocol was applied. Cognitive function was assessed using MMSE. General questionnaires were also used.

Results: Participants with low SPPB (42%, score 1-8) had lower phase angle, lower cognitive function, higher count of medication when compared to subjects with high SPPB (58%, score 9-12) but were not different in appendicular sceletal muscle (ASM), age or gender. In an age and gender corrected analysis, higher phase angle was associated with higher SPPB score (B = 3.2, P<0.001) and higher grip strength (B=6.5 kg, P<0.001). Further correction for medication, cognitive function or ASM did only marginally changes these associations.

Consclusion: Phase angle from BIA is associated with strength and function in older adults and could be a useful indicator for loss of independence in this vulnerable group.

PO1.044

Short physical performance battery and body composition in older Icelandic adults

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Background-Aim: Body Mass Index (BMI) and waist circumference are indicators of body composition and have been linked with with physical function in adults. Higher BMI, particularly when accompanied by excess fat, can lead to reduced mobility. Similarly, larger waist circumference, a marker of central obesity, is linked to poorer physical performance, such as slower gait speed and decreased balance. Conversely, low BMI in adults may signal sarcopenia, also impairing physical function. The aim of this study was to investigate the associations between indicators of body fatness and physical function in older adults (82±6 years) frequently using day-care services provided by the nursing homes in Reykjavik, Iceland.

Methods: A cross-sectional study was conducted in 73 community dwelling older adults (65.8% women, BMI=28.2±5.7; body fat%=42.8±9.0). Anthropometric measurements were conducted ad physical function was tested using the short physical performance battery (SPPB). Questionnaires were used to assess general characteristics of the participants.

Results: Women and men had similar BMI (28.7±6.5 vs.27.2±3.8 kg/m2) and waist circumference (99±15 vs.101±9 cm), respectively. However, women were more often presented in the highest and lowest quintiles of BMI and waist than men (P=0.006).The unadjusted mean SPPB scores in the BMI quintiles ranged from 7.9±3.5 to 8.9±2.7 (n.s. different) and

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6.9±3.4 to 9.1±17 in the waist quintiles (n.s. different) without any apparent clear pattern linked to body composition. Statistical correction for age, gender and medications did not change these associations. Further investigation of the three components of SPPB (balance, gait speed, chair test) did neither reveal any associations with indicators of body fatness.
Conclusion: Poor physical function was frequently seen in older adults using day-care services provided by nursing homes. However, at that age measures of body fatness do not longer seem to be associated with physical function. It can be speculated whether physical function at that age might be rather associated with disease, medications and muscle quality.

PO1.045

Estimates of body fat and risk of falls in older prefrail Icelandic adults

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Background-Aim: Higher body fat has been linked to the risk of falls in older adults. Excess body fat can potentially impair balance and mobility due to altered biomechanics and reduced relative muscle strength. The aim of this study was to investigate the associations between body fatness and risk of previous falls in older adults.
Methods: A cross-sectional study was conducted in 73 community dwelling older adults (65.8% women, 82±6 years, BMI=28.2±5.7; body fat%=42.8±9.0) who frequently used day-care services provided by the nursing homes in Reykjavik, Iceland. Bioelectrical Impedance Analysis (BIA) was used to measure body composition. Physical function was tested using the short physical performance battery (SPPB). Cognitive function was assessed using MMSE. Questionnaires were used to estimate previous falls and to assess general characteristics of the participants.
Results: Of the participants, 27.4% experienced a fall the previous 6 months. Those who fell, had on average poorer cognitive and physical function when compared to subjects who did not fall, however there were no significant differences between the two groups in gender, age, muscle mass or various estimates of body fat. According to logistic regression corrected for age and gender, an SPPB score increase by 1 was associated with a lower risk of previous fall by 23% (P=0.011). Further statistical correction for measures or body fatness and cognitive function did only marginally changes these associations.
Conclusion: In older adults measures of body fatness do not seem to be associated with risk of falls. As physical function is trainable even in old age, focus should be laid on the maintenance or even improvement of physical function with the potential aim of reducing risk of falls.

PO1.046

Differential FNDC5 expression and mitochondrial adaptations in white and brown adipose tissue in response to cold and obesity

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Introduction: FNDC5/irisin regulates adipocyte metabolism by enhancing white (WAT) and brown (BAT) adipose tissue browning and activity, respectively. We evaluated whether FNDC5 can modulate visceral WAT and BAT adaptive thermogenesis by improving mitochondrial homeostasis in response to cold and obesity.
Methods: Adipose tissue expression of FNDC5 and factors involved in mitochondrial homeostasis were measured in people living with obesity (n=159) and in rats with diet-induced obesity after 1-week cold exposure (n=61). The effect of different FNDC5 concentrations on mitochondrial biogenesis, dynamics and mitophagy was determined in vitro in human adipocytes.
Results: Circulating and visceral WAT expression of FNDC5 was reduced in patients and experimental animals with obesity, while its receptor, integrin αV, was increased (all P<0.05). Obesity upregulated mitochondrial fusion genes, while downregulating mitophagy transcripts in visceral WAT from patients and rats (all P<0.05). By contrast, in rat BAT, an upregulation of *Fndc5* and genes involved in mitochondrial biogenesis and fission was observed in response to obesity. Cold exposure, a major booster of BAT activity, triggered mitochondrial biogenesis and healthy peripheral fission, while repressing *Fndc5* expression and mitophagy in BAT from rats with diet-induced obesity. Interestingly, Fndc5 transcripts correlated with pathways contributing to mitochondrial elongation in rat BAT and WAT. In human adipocytes, FNDC5/irisin stimulated mitochondrial biogenesis (*TFAM*) and fusion (*MFN1, MFN2, OPA1*), while repressing peripheral fission (*DNM1L, FIS1*) and mitophagy (*PINK1, PRKN*) (all P<0.05).
Conclusion: Fat depot-specific differences in FNDC5 expression and mitochondrial adaptations in response to obesity and cold might indicate a self-regulatory mechanism to control thermogenesis in response to energy needs.

Conflict of Interest: None disclosed.

Funding: Supported by Fondo de Investigación Sanitaria-FEDER (PI22/00223 and PI22/00745) and CIBEROBN from the Instituto de Salud Carlos III (Spain).

PO1.047

Dietary Restriction of Individual Branched-Chain Amino Acids Modulates Body Composition and Energy Metabolism in a Distinct Manner

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Background and Objectives: Low-protein diets were reported to be associated with improved metabolic health in humans and rodents (1). These beneficial effects are thought to be mediated by reduced intake of branched-chain amino acids (BCAAs): leucine (Leu), isoleucine (Ile), and valine (Val), through the impact of individual BCAAs was not studied. In this work, we aim to study the impact of dietary restriction of individual BCAAs on body composition and energy parameters in rats.
Methods: Four-week-old male Sprague Dawley rats (n=32) were randomly divided into four groups based on their representative diets. We utilized four different diets: an AA-defined low-protein diet (~10 % of calories from protein, LP) and AA-defined three low-individual BCAA diets (Low-Leu, Low-Ile, Low-Val), in which the levels of leucine, isoleucine, or valine were reduced by 75% while maintaining ~10% of calories from protein. Body weight, composition, and food intake were monitored for 6 weeks. Energy parameters, including total energy expenditure (TEExp), energy intake (EI), and energy efficiency (EE), were also estimated.
Results: Weight gain was significantly different between the groups. The LP group had the highest weight gain (297.26 ± 37.90 g), followed by Low-Leu (234.79 ± 35.50 g), Low-Val (160.01 ± 46.92 g), and Low-Ile showing the least gain (96.39 ± 24.03 g). At the body composition level, the low-Val group exhibited the highest body fat percentage (35.5 %). The percentage of body fat of the low-Leu and low-Ile groups was sustained at about 20% over the experimental period, and this was lower than that of the LP (25.00%). While, the percentage of lean body mass (LBM) followed an opposing pattern. The Low Leu and Low Ile groups sustained their LBM% at about 70%. While that of the LP and Low-Val groups were reduced to 60% and 55%, respectively.

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In terms of energy parameters, the low-Ile group had the highest EI per 100 g body weight per day, as well as the highest total energy expenditure (TEExp) per 100 g of body weight per day (P value< 0.05). Additionally, EE (g/100 kcal) dropped significantly with isoleucine deficiency (P value< 0.05).

Conclusion: Our results highlight the distinct roles of individual BCAAs in modulating body composition and energy parameters in rats. Dietary restriction of Ile had the most pronounced reducing body weight gain that seems to be attributed to increased energy expenditure. In contrast, Val restriction was associated with increased adiposity and a marked reduction in LBM.

Reference

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PO1.048

Increased chaperone-mediated autophagy in adipose tissue of individuals with obesity: a novel contributor to adipose dysfunction in obesity

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Introduction: Chaperone-mediated autophagy (CMA) is a cellular process distinct from macroautophagy, mediating the specific degradation of proteins essential for cellular homeostasis. While it is involved in adipogenesis, its role in obesity remains unknown. Lamp2A is the key protein in the lysosomal pathway.

Methods: We performed RNA sequencing (RNAseq) analysis of subcutaneous (SAT) and visceral (VAT) adipose tissue from men and women with obesity, obesity combined with diabetes, and lean individuals (13 per group). We measured 39 anthropometric, body composition, and circulating parameters, as well as the CMA score, a validated indicator of CMA activity based on the combinatorial values of 18 transcripts (Bourdenx et al., 2021). Bulk RNAseq and single-nucleus RNA sequencing (snRNA-seq) data from SAT and VAT of high-fat diet-induced obese mice were also analyzed. Alternative splicing-derived expression of Lamp2A was assessed using qRT-PCR, and Lamp2A protein levels were measured by immunoblotting. Human SGBS adipocytes were used to determine Lamp2A expression in response to obesogenic insults in vitro.

Results: CMA score was significantly increased in VAT, but not in SAT, in individuals with obesity, particularly in women. Upregulation of Lamp2A mRNA was observed in VAT from individuals with obesity. Lamp2A mRNA levels in VAT were positively correlated with body mass index (BMI) and markers of dysmetabolism (e.g., glycemia, triglyceridemia, HbA1c). A significant reduction in CMA score was observed in VAT after bariatric surgery in individuals with obesity. In mouse models of obesity, CMA score was increased in VAT, and further analysis of separate cellular fractions and single-nucleus RNA sequencing indicated the involvement of adipocytes in CMA induction. This was associated with increased Lamp2A protein in adipose tissues from high-fat diet obese mice. There was a highly significant negative correlation between Lamp2A mRNA levels in human VAT and the expression of transcripts for marker genes of endoplasmic reticulum (ER) stress (e.g., HSPA5). Treatment of human adipocytes in culture with several agents mimicking distinct obesity-related insults demonstrated a strong effect of ER stress inducers (thapsigargin, tunicamycin) in increasing Lamp2A expression.

Conclusion: CMA is overactivated in adipose tissue in individuals with obesity, particularly in women, and this activation is associated with systemic metabolic dysregulation. ER stress appears to play a relevant role in the induction of adipose CMA in obesity. The role of adipose CMA over-induction in the etiopathogenesis of obesity warrants further investigation.

Reference

Bourdenx et al., Cell 2021, 184, 2696.

Conflict: of Interest: None.

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PO1.049

Transient receptor potential vanilloid 1 (TRPV1) channel in the regulation of food intake

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Introduction: Obesity is a growing global epidemic associated with comorbidities such as insulin resistance and metabolic syndrome. The TRPV1 channel plays a critical role in metabolic health and disease and although it has been extensively studied in metabolic research, findings are often inconsistent due to methodological variations, particularly regarding the use of non-thermoneutral temperatures.

Methods: C57BL/6J (WT) and *Trpv1-/-* (KO) male mice aged 3 months were acclimated for 2 weeks at 30°C (12:12h light-dark cycle, lights on at 7 AM, 300-400 lux), and fed a chow diet (CD, 3.8 kcal/g, 50 g/kg fat, Nuvilab® CR-1 Irradiated, Quimtia S.A, SC, Brazil) and water ad libitum. The animals were then single-housed and maintained for 8 weeks in thermoneutral condition (30°C) or at 22ºC while being fed a CD or a high-fat diet (HFD) (60% kcal, 348 g/kg fat, RH19572C, Rhoster Ind. e Com. Ltda., SP, Brazil) to induce obesity. At week 7 the glucose tolerance test (GTT) was performed, and lipids from the animals' feces (1 g collected over 72 h) were extracted and quantified. At the end, the animals were euthanized at 9 AM, and blood, hypothalamus, liver, brown adipose tissue (BAT), and white adipose depots (WAT) were collected (CEUA IB-USP 373/2021). Weight gain, food intake, levels of lipids in the blood and liver, and the expression of hypothalamic genes that regulate appetite were evaluated.

Results: No differences in weight were observed between genotypes or temperatures in CD or HFD-fed mice, although the HFD induced obesity in all groups. CD mice subjected to cold exhibited higher food consumption than their controls at 30°C. In the KO animals on HFD, glucose metabolization was significantly slower at 22°C compared to the KO control at 30°C and WT animals at 22°C. WT and KO mice on HFD subjected to cold showed higher serum cholesterol and triglycerides than their controls at 30°C. KO animals on HFD at 30°C eliminated more fat in the feces than the other groups. As to organ mass, the KO group on CD at 22°C had a smaller BAT than its control at 30°C, unlike the HFD animals which showed no difference between genotypes or temperatures. Among HFD, similarly to CD groups, there was no difference in any of the WATs. The liver of the KO animals at 22°C on CD was heavier than their controls at 30°C. Increased expression of hypothalamic leptin receptor was observed in KO on HFD at 30°C compared to WT at 30°C. Increased expression of the hypothalamic pro-opiomelanocortin was observed in WT animals on HFD at 22°C relative to their controls at 30°C.

Conclusion: Our results suggest that the TRPV1 channel plays a key role in regulating dietary responses, as its absence does not impact weight gain

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but significantly alters glucose metabolism, lipid elimination, and hypothalamic signaling in both thermoneutrality and cold conditions, particularly in animals subjected to a high-fat diet.

Conflict of Interest: None.

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PO1.050

Blood urea nitrogen and abdominal adipose tissue adipocyte hypertrophy in bariatric surgery candidates

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Introduction: Some studies have reported increased blood urea nitrogen (BUN) levels in individuals living with obesity, but this association has not been uniformly observed and remains uncertain. Whether indirect assessment of adipose tissue dysfunction through measurement of adipocyte hypertrophy can provide additional insight into the association between BUN and obesity has never been examined.
Objective: The aim of the present study was to examine whether adiposity markers such as the body mass index (BMI), waist circumference or the diameter of adipocytes located in the abdominal subcutaneous or the visceral, omental fat compartment are related to increased BUN.
Methods: We examined a sample of 102 participants (32 men, 70 women) who were candidates for bariatric surgery within the REMISSION study. A total of 52 participants had a diagnosis of type 2 diabetes (51% of the sample). Fasting blood samples were obtained during the preoperative visit for BUN and creatinine measurements. During surgery, visceral adipose tissue samples were obtained from the greater omentum and abdominal subcutaneous adipose tissue was sampled from the site of trocar insertion. Adipose tissues were immediately frozen in liquid nitrogen and were later formalin-fixed during the thawing process. Fixed tissues were embedded in paraffin, and 5 µm-thick slices were mounted on microscope slides and stained with hematoxylin and eosin. Adipocyte diameter measurements were performed on whole-tissue images using an automated, high-throughput analysis method. Mean adipocyte diameter of each adipose tissue sample was used in all analyses.
Results: Average BMI of the sample was 43.4±4.9 kg/m² and participants were 46.7±9.4 years old on average (mean ± SD). Mean eGFR value was 99.6±14.9 mL/min, and only one participant had a value <60 mL/min. BUN was not significantly correlated with BMI or waist circumference but was significantly and positively related with age ($r=0.33$, $p<0.0006$). BUN tended to be higher in participants with versus those without type 2 diabetes (respectively 5.4±1.4 vs. 5.0±1.2 mmol/L, $p=0.10$). Average adipocyte size was 70.0±14.1 vs. 75.1±12.8 µm respectively in omental versus subcutaneous adipose tissue ($p<0.008$). BUN was significantly correlated with omental adipocyte size ($r=0.22$, $p<0.03$), and a trend for a positive correlation was observed between BUN and subcutaneous adipocyte size ($r=0.17$, $p=0.10$). Comparable results were observed for correlations between the BUN/creatinine ratio and adipocyte size measurements. Age was significantly and positively associated with adipocyte size in both the subcutaneous ($r=0.28$, $p<0.005$) and omental ($r=0.21$, $p<0.04$) fat compartment. After adjustment for age, the association between BUN and visceral adipocyte diameter was no longer significant.
Conclusion: BUN is not related to waist circumference or BMI in individuals with severe obesity who are candidates for bariatric surgery. Yet, BUN positively relates to omental adipocyte hypertrophy, a phenomenon that seems to be explained by the age-related increase in both visceral fat cell size and BUN.

PO1.051

1. Preventive Effects of Silver Sulfadiazine on DEX-Induced Atrophy of C2C12 Myotubes through HDAC4 Inhibition

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Aim/Hypothesis: Muscle atrophy refers to reduction in muscle mass or size due to changes in external and internal environment of muscle tissues. Recent studies have continuously reported that changes in expression and activity of histone deacetylase (HDAC) are associated with muscle atrophy. However, effects of silver sulfadiazine on skeletal muscle atrophy and the association between silver sulfadiazine and HDACs remain unclear. Interestingly, we have found that sulfadiazine can effectively inhibit HDAC4 activity in an in vitro assay.
Methods: In this study, we investigated protective effects of silver sulfadiazine in DEX-induced atrophy of C2C12 myotubes. To measure effects of sulfadiazine on muscle atrophy, C2C12 myotubes were treated with dexamethasone with or without sulfadiazine. Atrophy of myotube was then measured by phalloidin staining. To investigate protective mechanisms of sulfadiazine, several phenomena related to muscle atrophy were tested using RT-PCR and western blotting.
Results: Results showed that DEX induced muscle atrophy in a time- and dose-dependent manner in differentiated C2C12 myotubes. DEX also induced expression of muscle-specific ligases, including muscle ring finger 1 and muscle atrophy F box. It also activated the ubiquitin-proteasome system, leading to muscle atrophy rather than autophagy or apoptosis. Interestingly, sulfadiazine administration alleviated DEX-induced myotube atrophy. Additionally, expression levels of muscle-specific ligases such as Atrogin-1 were reduced by sulfadiazine treatment. Sulfadiazine not only decreased the expression of Myostatin, but also restored the expression of suppressed IGF-1.
Conclusion: In this study, we discovered that sulfadiazine, a new HDAC4 inhibitor, could alleviate muscle atrophy in DEX-induced muscle atrophy models.

PO1.052

NLRP1 induction in metabolic dysfunction associated steatohepatitis is mediated by palmitic acid

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Introduction: Obesity is a major risk factor for metabolic dysfunction-associated steatotic liver disease (MASLD), one of the most prevalent causes of liver disease worldwide. The spectrum of this condition ranges from simple steatosis (SS) to metabolic dysfunction-associated steatohepatitis (MASH), which may evolve to fibrosis and cirrhosis, and ultimately to hepatocellular carcinoma and liver failure. MASH is characterized by steatosis, inflammation and hepatocellular ballooning. Several studies have demonstrated that NLRP3 inflammasome plays a central role in MASLD

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development and progression. However, the role of other important inflammasomes such as NLRP1 in MASLD remains unclear.
Methods: We performed a case-control study in 150 patients with severe obesity undergoing bariatric surgery recruited at the Virgen de la Arrixaca University Hospital (Murcia, Spain). Patients were divided into three different groups: i) No MASLD (N=53); ii) SS (N=43), or iii) MASH (N=54) depending on the histological findings in the liver biopsies according to the Steatosis, Activity, and Fibrosis classification system. NLRP1 expression was evaluated by RT-qPCR and immunohistochemistry in liver biopsies. Palmitic acid (PA) levels in human liver tissue were evaluated by gas chromatography-mass spectrometry (GC-MS). To determine the specific effects of PA accumulation on NLRP1 expression in hepatocytes we exposed both HepG2 cells and a model of patient-derived liver organoids to different concentrations of PA. Finally, to evaluate if PA was able to activate NLRP1 inflammasome, we used a model of HEK293 cells expressing ASC-GFP and transfected with NLRP1. Finally, we assessed whether OA could prevent NLRP1 activation after incubation with PA.
Results: NLRP1 mRNA expression and protein levels were increased in patients with severe obesity and MASH compared to patients without MASLD or with SS. Also, the levels of hepatic PA were positively correlated with *NLRP1* mRNA expression in the liver. The use of the *in vitro* models revealed that the NLRP1 inflammasome expression is induced by PA in both human HepG2 cells and patient-derived liver organoids. Furthermore, NLRP1 was activated by PA, but not myristic acid (another saturated fatty acid with lipotoxic properties and related to MASLD), and that such activation was inhibited by OA.
Conclusion: Our results revealed a novel role of the hepatic NLRP1 inflammasome in the human liver. However, further research is needed to fully understand the complex role between NLRP1, inflammation, and metabolic processes in the development of MASLD.

Conflict of Interest: None Disclosed

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PO1.053

HDAC3 inhibitor alleviates diabetic skeletal muscle atrophy by decreasing myostatin

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Aim/Hypothesis: Myostatin is considered one of the major pathogenic factors inducing diabetic muscle atrophy. Recently, it has been reported that an increase in myostatin can induce diabetic muscle atrophy. However, the relationship between myostatin and an HDAC3 inhibitor in skeletal muscle atrophy has not been well studied. Thus, this study aimed to investigate preventive effects of an HDAC3 inhibitor on diabetic muscle atrophy in db/db mice through inhibition of myostatin.
Methods: To investigate effects of an HDAC3 inhibitor on diabetic muscle atrophy, db/db mice were randomly divided into three groups: a control group, a db/db group, and a db/db plus HDAC3 inhibitor group. Mice were administered the HDAC3 inhibitor for eight weeks. To evaluate effects of the HDAC3 inhibitor on myostatin, we analyzed myostatin protein and RNA levels using ELISA and RT-PCR. To explore molecular mechanisms of the HDAC3 inhibitor, several cell signaling molecules related to muscle atrophy were tested using western blotting.
Results: Administration of the HDAC3 inhibitor to db/db mice alleviated muscle weight loss and muscle atrophy. Myostatin levels along with MuRF1 and atrogin-1 expression were significantly increased in the diabetic group (db/db mice) compared to those in the control. These increases were effectively reduced by HDAC3 inhibitor treatment. Next, we investigated intracellular signaling molecules of myostatin. p-SMAD2 and p-SMAD3 levels were markedly reduced in the HDAC3 inhibitor-treated group, alongside decreases of t-SMAD2, t-SMAD3, and SMAD4 in the same group. These results suggest that the HDAC3 inhibitor can suppress myostatin-mediated SMAD signaling and its downstream effects on muscle atrophy. Additionally, the HDAC3 inhibitor can modulate myostatin signaling through FOXO, AMPK, mTOR, and AKT.
Conclusion: In this study, the HDAC3 inhibitor ameliorated muscle atrophy by decreasing myostatin in db/db mice. Results of this study suggest that the HDAC3 inhibitor might serve as a basis for developing therapeutic drugs for atrophy-related muscular or metabolic diseases.

PO1.054

Central inhibition of Kinase Protein regulates energy balance and glucose metabolism

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Introduction: This Kinase Protein is mostly expressed in the brain, and it has been studied in neurodegenerative diseases such as Alzheimer's and Huntington's Disease. Its role in obesity is practically unknown, but recently it has gained importance as a potential molecular target implicated in diseases involving disruptions in energy homeostasis. The main objective is to get to know the central role of this Kinase Protein in energy balance and glucose metabolism.
Methods: To achieve this objective, we inhibited the expression of this kinase protein pharmacologically through the central administration of an antagonist to lean and obese male mice. We also perform a genetic inhibition by using an AAV vector expressing a shRNA to specifically inhibit this kinase protein in proopiomelanocortin (POMC) and agouti-related protein (AgRP) neurons of lean and obese mice of both sexes. We then measured various physiological parameters, such as body weight, food intake, body composition, and glucose and insulin tolerance.
Results: The pharmacological inhibition of this kinase promotes a reduction in body weight associated with decreased food intake and increased energy expenditure. Concurrently, these mice exhibited improved glucose and insulin tolerance. Consistent with these findings, the ablation of the kinase protein in POMC neurons reduces body weight and adiposity while improving glucose tolerance and liver metabolism in female mice fed a high-fat diet, but not in males. Conversely, inhibition of the kinase protein in AgRP neurons leads to increased body weight in male mice fed a standard diet and worsens glucose homeostasis and insulin resistance in both lean mice and those fed a high-fat diet.
Conclusions: We provide the first evidence establishing the central role of this kinase protein in the regulation of energy and glucose metabolism.

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PO1.055

The role of leptin and GPx4 in adipogenesis: Their interconnection and dynamics in the 3T3-L1 cell line model

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Introduction: Obesity is a complex condition caused primarily by an imbalance between energy intake and expenditure, resulting in an increasing adipose tissue. Leptin plays a key role in regulating the maturation of fat cells, while glutathione peroxidase 4 (GPx4) protects cells from oxidative stress and ensures proper adipocyte function. Disruptions in these functions are associated with the development of obesity and affect energy balance, adipogenesis, and fat cell health. Although the individual roles of leptin and GPx4 are well understood, their interactions and dynamics during different stages of adipogenesis in the 3T3-L1 cell line model remain insufficiently explored. This study examines the changes in leptin and GPx4 concentrations during adipogenesis to better understand their potential connection and role in regulating this process.
Methods: The adipogenesis protocol was performed with the 3T3-L1 cell line using a DMEM base medium with 1% antibiotic solution (penicillin/streptomycin) and 10% FBS, alongside two additional media for adipogenesis induction. The differentiation medium (dexamethasone, insulin, and IBMX) was administered from day 0 to day 4, the insulin medium from day 4 to day 7, and the base medium from day 7 to day 10, each for 72 hours. Cell lysates were collected at all time points after which leptin and GPx4 concentrations (ng/ml) were determined with the ELISA assays. Cell viability was tested with an MTS assay according to the manufacturer's protocol. The success of adipogenesis was visually confirmed by staining the lipid droplets with Oil Red O (ORO).
Results: The adipogenesis protocol proved to be highly effective, with clear cell viability at all stages confirmed by the MTS assay and ORO staining visualizing the end products of adipogenesis at all time points. The number and size of lipid droplets increased progressively, with the highest lipid accumulation on day 10. After 4 days of the adipogenesis protocol, concentrations of leptin and GPx4 showed a significant increase compared to day zero (leptin: 1.39±0.97 vs. 0.20±0.18, p=0.04; GPx4: 0.53±0.20 vs. 0.09±0.04, p=0.01). However, following the transition to an insulin-enriched medium and subsequently to a basal medium, the concentrations of both analytes decreased progressively (leptin: 0.46±0.25 on day 7, 0.32±0.11 on day 10; GPx4: 0.27±0.09 on day 7, 0.30±0.15 on day 10). Also, the results of the correlation indicated that there was a significant large positive relationship between leptin and GPx4 ($r = 0.505$, $p < 0.001$).
Conclusion: Leptin and GPx4 play an important role in the early stages of adipogenesis and demonstrate a significant interconnection in the regulation of fat cell differentiation. Changes in their concentrations, depending on the stage of adipogenesis and the conditions of the medium indicate that they adapt to the metabolic needs of the cells and suggest that leptin may be one of the key factors contributing to increased oxidative stress during the adipogenesis process.

Conflict of Interest: None Disclosed

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PO1.056

Reduced liver expression of Prodh1 (proline dehydrogenase 1) gene promotes hyperprolinemia and predisposes to hepatic triglyceride accumulation in the rat

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The spontaneously hypertensive rat (SHR) is the most widely used model of essential hypertension and under specific environmental conditions also exhibits features of the metabolic syndrome, including ectopic fat accumulation. For analyses of such complex traits in the SHR, we developed recombinant inbred (RI) strains, derived from SHR and BN (Brown Norway) progenitors, the HXB/BXH RI strains (N=30). The RI strain analysis allows the use of intermediate phenotypes such as the transcriptome or metabolome to reveal relationships between DNA-level variability and variability of complex metabolic traits. In the current study, we used LC-MS analysis of liver samples. Genome-wide linkage identified a significant metabolomic QTL (mQTL) that was associated with hepatic proline concentration on chromosome 11 (LOD score 7.5). Hepatic proline concentration correlated with hepatic Prodh1 (proline dehydrogenase 1) gene expression (r=-0.82, p=3.55e-09). The Prodh1 gene expression is cis-regulated and its eQTL (expression QTL) overlaps the proline mQTL on chromosome 11. Negative correlation indicates that reduced proline catabolism results in increased hepatic proline concentrations. In addition, liver proline concentrations correlated with hepatic expression of genes involved in fatty acid metabolism (Acsbg1, Acadl, Acox2, Acss3, Gk) and with liver triglycerides (r=0.46, p=0.0032). These results suggest that increased proline levels predispose to fat accumulation in the liver. Proline could be a potential biomarker for non-alcoholic fatty liver disease (NAFLD), particularly in understanding its metabolic pathways and disease progression.

PO1.057

Effects of nuts intake on neurodegeneration in APPSwe / PS1dE9 and wild type C57BL/6J mice

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Introduction: Metabolic disorders, such as obesity and type 2 diabetes mellitus, are recognized risk factors for neurodegeneration and the development of Alzheimer's dementia (AD) (1, 2). High-fat diets are regularly associated to a worsening metabolic status and a higher risk of developing dementia (3). However, regular consumption of healthy fatty foods, such as nuts, has been shown to have a beneficial metabolic role and to decreases the risk of developing AD (4). The nutritional regulation of microRNAs could be crucial to regulate genes linking peripheral glucose and insulin metabolism to brain damage reduced levels of neuroinflammation (5). The present study aims to assess the effect of nut intake on the improvement of glucose/insulin metabolism, cognition, neuroinflammation and neurodegeneration through the regulation of peripheral and brain microRNAs.
Methods: C57BL/6J and APPSwe/PS1dE9 mice were fed either with a regular diet or the same diet supplemented with 10% of the energy intake coming from nuts, over a period of 6 months. Peripheral glucose and insulin metabolism, cognitive and learning test, brain morphology and function, and neuroinflammation and neurodegeneration markers were assessed. Furthermore, microRNAs expression in both circulating and brain tissue was measured.
Results: Those mice fed with a nuts-enriched diet exhibited non-disrupted glucose and insulin metabolism, along with better performance

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in learning and memory tests, increased dendritic spine density and reduced neuroinflammation. Furthermore, differentially expressed microRNAs were identified between intervention groups, which may act as mediators between glucose metabolism and cognition.
Conclusions: Regular consumption of nuts mitigate cognitive decline, neuroinflammation and neurodegeneration in AD genetic mice through the modulation of specific microRNAs. These findings support a beneficial role of nuts consumption in the primary prevention of AD, particularly among high-risk populations, such as individuals with obesity or type 2 diabetes.

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PO1.058

Elucidation of the signaling pathways and function of GPR101 in obesity

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Introduction: GPR101 is an orphan G protein-coupled receptor that is highly expressed in the hypothalamus and the deletion of its gene in mice leads to an increase of body weight and adiposity underscoring its potential protective role against obesity. However, the function and signaling properties of GPR101 are elusive because of the lack of natural or synthetic ligands precluding its validation as a drug target. Therefore, we sought to characterize GPR101 signaling pathways, in particular the trafficking and cellular regulation of the receptor.
Methods: We cloned in expression vector the human GPR101 fused to an N-terminus FLAG epitope and we generated cells stably expressing FLAG-GPR101. Subsequently, we determined the receptor precise cellular localization and trafficking by using flow cytometry and confocal microscopy. We then used several pharmacological transduction assays and we developed a bioluminescent β-arrestin complementation test to decipher GPR101 signaling pathways. We also generated several mutants that can increase and/or alter GPR101 activity.
Results: GPR101 is characterized by a very high constitutive activity. We detected important constitutive cAMP production that was linked to Gs activity, and we completed our study with an examination of receptor coupling to other G proteins and pathways. We also demonstrated an important basal interaction with Arrestin 2 (β-arrestin 1) and Arrestin 3 (β-arrestin 2). By using a GPR101 mutant lacking the C-terminus and cell lines with an Arrestin 2/3 null background, we showed that the arrestin association leads to a constitutive internalization of GPR101 through the clathrin and dynamin pathway and its relocation into endosomes. We completed our study by examining the colocalization of GPR101 with Rab proteins. GPR101 was not colocalized with the recycling endosome marker Rab11. However, internalized GPR101 was mainly colocalized with the early endosome markers, Rab5 and EEA-1, and to a lesser degree with the late endosome marker Rab7. We could also evidence that GPR101 is degraded through the lysosomal pathway.
Conclusion: This information constitutes an absolute prerequisite to establish a strong mechanistic link between GPR101 activation in the hypothalamus and obesity, and/or to treat people suffering from metabolic disorders.

PO1.059

Impact of different meal types and macronutrients on circulating FGF21 and appetite in humans: a systematic review and meta-analysis of randomized trials

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Introduction: Fibroblast growth factor 21 (FGF21) is potentially involved in macronutrient-specific appetite regulation, by increasing preference for protein and suppressing preference for sugar. In rodents, secretion of FGF21 is stimulated by intake of sugar and restriction of protein, suggesting a feedback mechanism to balance the intake. However, less is known about the regulation of FGF21 in humans. The present systematic review and meta-analysis aims to investigate how intake of different macronutrients and sweeteners impact circulating FGF21 concentrations and appetite in humans.
Methods: The databases MEDLINE, EMBASE and CENTRAL were searched for eligible studies. Our study includes acute and longer-term randomized dietary intervention trials with either a parallel or cross-over design, in adult human participants where circulating FGF21 was measured in the fasting state and/or in response to intake of macronutrients or sweeteners. Trials including pregnant or lactating women, individuals with diabetes, kidney disease, liver disease, metabolic disease, current or previous alcohol abuse and that had undergone bariatric surgery will be excluded. Two researchers will independently screen all studies for eligibility using EPPI-Reviewer 6. Sub-group analyses will be conducted to investigate whether the FGF21 response to different macronutrients differs between individuals with underweight, normal weight, overweight or obesity. To assess the robustness of the results sensitivity analyses will be done by performing multiple meta-analyses where one study at a time will be excluded from the analysis (leave-one-out meta-analysis). Risk of bias will be evaluated using Cochrane risk-of bias tool for randomized trials (Rob2).
Results: In the database literature search performed 3 December 2024, 2594 unique articles were found and are under current screening. Further results will be presented at the conference.

Conflict of Interest: AR is currently employed by and holds stocks in Novo Nordisk A/S, Copenhagen, DK. LGG holds stocks in Novo Nordisk A/S, JSQ has received research grants from Novo Nordisk A/S, LR is employed by Nestlé Denmark A/S.

Funding: This review is conducted at Steno Diabetes Center Copenhagen (SDCC) and University of Copenhagen. SDCC is a public hospital and research institution under the Capital Region of Denmark, which is partly funded by a grant from the Novo Nordisk Foundation and receives funding from the Danish Diabetes and Endocrine Academy. The funders had no role in any part of this review.

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PO1.060

Effects of Flavonoid and Fiber-Enriched Diets in Combination with GLP-1 Analogue Therapy on Metabolic Syndrome and Type 2 Diabetes: A Gender-Based Analysis

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Introduction: Metabolic syndrome (MetS) is a chronic metabolic disorder caused by the interaction between environmental, genetic and epigenetic factors. Unhealthy eating habits and sedentary behavior represent the main risk factors. Patients with MetS may present cardiometabolic disorders including insulin resistance, type 2 diabetes mellitus (T2D), cardiovascular diseases and inflammation. The criteria for defining MetS have been established by the International Diabetes Federation (IDF)*. Treatment strategies primarily involve lifestyle changes, including physical activity and nutritional intervention. Adherence to a Mediterranean diet, enriched with polyphenols and fiber, is associated with significant improvements in overall health status, reducing the risk of MetS and T2D development and progression. Aim of the study is to evaluate the effects of a diet enriched with flavonoids and fiber, in combination with GLP-1 analogue therapy, on metabolic, inflammatory, and immunological parameters in subjects with MetS and T2D. Additionally, gender differences will be highlighted in response to nutritional interventions in order to develop a personalized therapeutic strategy differentiated by sex/gender.
Methods: At the start of the study (T0), 72 subjects with MetS and T2D (M to F ratio 1:1) will be recruited. At T0, urine and blood samples will be collected, fat/lean mass will be evaluated, diet and physical activity will be monitored, metabolic and inflammatory markers will be analyzed, and hepatic function will be assessed. Patients will be randomly divided into two groups: DIET-A (standard diet for T2D patients; fiber content: 30-40 g/day; flavonoid content: ≤100 mg/day) and DIET-B (same protocol as DIET-A but with fiber content: 45-50 g/day; flavonoid content >200 mg/day). PBMCs will be isolated from blood samples using a Ficoll density gradient to evaluate the frequency of monocyte subsets by FACS analysis (staining with antibodies CD14, CD16, CD14/CD16). Plasma will be separated to perform ELISA assays (cytokine dosage) and ROS assays. Isoprostane and flavonoid metabolite assays will be conducted on urine samples by gas-chromatography. The study will last eight months, after which (T1) the same analyses as T0 will be performed.
Results: Currently the analyses have been performed on 12 patients (6 men and 6 women) at T0. ELISA results showed that leptin levels were higher in men subjects, while adiponectin levels were higher in women. ROS plasma levels, evaluated by the CM-H2DCFA assay, were higher in men. Flow cytometer analysis of the monocyte intermediate CD14++CD16+ subset revealed that the frequency was higher in men respect to women.
Conclusion: At T0, men subjects appear to have a higher inflammatory status than women. However, these are only preliminary results: at the end of the treatment, the effects of the diets will be also evaluated on the inflammatory state, in order to highlight gender differences. The expected outcomes from the treatment include a reduction in the inflammatory state and improved quality of life.

Reference

*https://idf.org/media/uploads/2023/05/attachments-30.pdf.

PO1.061

Acetamiprid's impact on obesity: exploring mechanisms and gender differences

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Introduction: Pesticides are chemicals or biological agents mainly used in agriculture to control pests[1]. Their use is increased worldwide, due to their efficacy. Acetamiprid (ACE), a neonicotinoid insecticide, is widely used to protect crops from insects by targeting nicotinic acetylcholine receptors[2]. ACE is mainly applied to vegetables and fruits, and its small molecular weight and high-water solubility allow it to penetrate plant tissues and persist for a long time. Consequently, dietary intake is the main route of human exposure to this pesticide. Several in vitro and in vivo studies suggest that exposure to neonicotinoids can be associated to obesity and increased oxidative stress[4]. However, there is a lack of knowledge for acetamiprid effects on humans and its potential influence on obesity and diabetes. This study aims to determine the role of ACE in obesity, its mechanism of action, and its effects on adipose tissue (AT) in subjects with severe obesity (BMI>35), highlighting gender differences.
Methods: Sixteen subjects with severe obesity (8 men and 8 women) were recruited. During bariatric surgery, AT biopsies and blood samples were collected from each patient. AT was incubated for 24h with ACE 150nM or without ACE (control). After 24h, tissue samples and supernatants were collected for further analysis; the tissue was homogenized and lysed. Protein expression of p66shc (involved in ROS production), p-NFkB (pro-inflammatory factor), PPARγ (anti-inflammatory factor) and adiponectin (adipocytokine with anti-inflammatory role), were evaluated by Western blot analysis. Free fatty acids (FFA) release was measured on supernatants by a colorimetric test. Leptin, adiponectin and TNF-α levels were measured in plasma using Elisa test. Reactive oxygen species (ROS) production was measured in plasma using the CM-H2DCFA probe.
Results: The results showed that ACE increases p66shc, PPARγ and p-NFkB expression in AT in both sexes, while adiponectin expression increases only in female subjects. ACE induces ROS production in both sexes ($p<0.05$). Additionally, ACE treatment increased FFA production in men and decreased in women. Leptin and TNF-α levels were reduced in both sexes, while adiponectin levels were increased in female patients.
Discussion: The obtained results showed that ACE treatment, after 24h, increases the oxidative and inflammatory status of AT in both male and female subjects with severe obesity; induces FFA production in men and reduces it in women; and stimulates adipogenesis in both sexes. These findings suggest that further studies are needed to identify new sex-specific markers to elucidate the mechanism by which ACE contributes to promoting obesity and related diseases.

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PO1.062

Identification of new metabolic targets in prolonged breastfeeding

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Introduction: Obesity is a multifactorial pathology, including environmental, genetic and epigenetic factors. The rapid increase in its prevalence is highly affected by early-life determinants and epigenetic character. One critical parameter for neonates is infant feeding, especially breastfeeding, which has been proposed as a protective factor against obesity. Previous work of our group has described that prolonged breastfeeding protects against obesity by increasing hepatic production of FGF21, which acts in the lateral hypothalamus, activates thermogenesis and reduces body weight.
Methods: We used an animal model of prolonged breastfeeding in rats, maintaining the offspring on either a chow diet or a high-fat diet until adulthood or 5 weeks of life. Transcriptomic and proteomic techniques have been used to identify other protective mechanisms of lactation against obesity and chemogenetic manipulation in vivo to unmask their relation with FGF21. PCR was used to validate RNAseq results and Western Blot to analyze protein levels.
Results: Prolonged breastfeeding has significantly altered the expression of 299 hepatic genes in rats with diet induced obesity (DIO). Some enriched Gene Ontology Biological Process related with these genes are "circadian rhythm", "glucose homeostasis", or "lipid storage". Among the modified factors, we selected and studied KLF15 and ANGPTL4 for their relation to energy metabolism. Both proteins are present in human breast milk. Hepatic ANGPTL4 protein levels were decreased by prolonged breastfeeding in adult DIO rats, but not early in life. We also described a novel mechanism by which hepatic FGF21 increases ANGPTL4 levels in the lateral hypothalamus.
The regulation of KLF15 by prolonged breastfeeding is age-dependent. While prolonged breastfeeding increases KLF15 expression in the liver of DIO rats, it decreases the protein levels. Early in life, 5-week-old rats show no changes in KLF15 levels by prolonged breastfeeding, whereas newly weaned rats show increased hepatic KLF15 levels.
Plasma proteomic analysis has shown significant modification of 152 proteins by prolonged lactation in rats with diet-induced obesity. Some of the enriched functions related with these proteins are associated with bone homeostasis, male gonad characteristics, brain development, nucleoside metabolic processes and hemostasis regulation.
Conclusion: This study opens new lines of research on the effects of prolonged lactation on energy metabolism and identifies potential novel therapeutic targets for the treatment of obesity.

PO1.063

Key genes implicated in the subcutaneous adipose tissue remodeling after bariatric surgery

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Introduction: Bariatric surgery is considered the best therapeutic option that achieves satisfactory results in the medium and long term for the treatment of obesity and diabetes. The adipose tissue remodeling after bariatric surgery implicates the modulation of genes. However, the most contributor genes in this adipose tissue remodeling before the depth weight loss remain unknown. The aim of the present study is to identify new therapeutic targets in the modulation of the transcriptome that occurs in the subcutaneous white adipose tissue (scWAT) after weight loss and the metabolic improvement in patient with obesity three months after bariatric surgery.
Materials and Methods: Twenty-two patients with obesity who underwent Bypass gastric (16 women and 6 men) between June 2022 and June 2023 have been included in the study, excluding those patients who presented other inflammatory pathologies that could alter the results of the study. Blood samples and scWAT biopsies were taken at the time of the intervention and three months after it, as well as the clinical data and anthropometric measurements of the patients. Subsequently, a transcriptomic study was carried out by RNAseq of the scWAT biopsies.
Results: Our results show that, after three months of the bariatric intervention, the patients show decreased levels of blood glucose, and decreased levels of HbA1c (IFCC), insulin, triglycerides and cholesterol in serum ($p<0,05$). In this line, HOMA IR was decreased in patients after three months of the intervention. It worth nothing that after three months of the surgery intervention, scWAT showed a transcriptomic remodeling (210 genes upregulated, 136 genes downregulated and 34260 did not change) which is related to insulin resistance, inflammation, fibrosis and adipocytokine pathways (GO, KEGG and Reactome enrichment analysis). Moreover, a validation of the RNAseq were performed with the most significant target genes modulated before surgery and three months post-intervention.
In terms of transcriptomic data, we identified ANGPTL8 as a gene strongly upregulated in sWAT of patients with obesity 3 months after the surgery. ANGPTL8 plays a crucial role in lipid metabolism by regulating the activity of lipoprotein lipase (LPL), a key enzyme involved in the hydrolysis of triglycerides from circulating lipoproteins. We also conducted a correlation study to evaluate the relationship between ANGPTL8 levels and various clinical variables in our sample. The results revealed significant associations, including both positive and negative correlations, suggesting a potential role for ANGPTL8 in metabolic regulation and its interaction with clinically relevant parameters.
Conclusions: Our study shows the first signs of metabolic improvement in scWAT after bariatric surgery, identifying those genes and pathways modulated after 3 months of the intervention. These results will promote the discovery of novel therapeutic targets to fight obesity and related metabolic disturbances

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PO1.065

HMG-CoA reductase inhibitor lead to fibro-adipogenic progenitor differentiation

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Introduction: Skeletal muscle degeneration is characterized by the progressive replacement of parenchymal muscle cells with non-contractile tissues, including extracellular matrix (ECM) proteins and adipocytes. This transition leads to the loss of both contractile and metabolic functions, ultimately impairing muscle performance. Fibro-adipogenic progenitors(FAPs) are well known for the cellular origin of fibrosis and adipocyte within the muscle tissue. Therefore, understanding the fundamental mechanisms governing FAPs cell fate decision and differentiation process is crucial for understanding pathological muscle remodeling and may also provide valuable insights for developing therapeutic intervention that can target muscle degeneration.
Methods: Using fluorescence-activated cell sorting (FACS) we isolated CD31-CD45-CD56-PDGFRa+ FAPs population from human quadriceps muscle biopsies and performed transcriptomic profiling via single cell RNA sequencing.
Results: Unsupervised clustering revealed six transcriptionally distinct including the previously reported CD90+ subpopulation. Notably, treatment with an HMG-CoA reductase inhibitor led to an increase in the number of FAPs 5 and a decrease in the FAPs 1 subpopulation. Differential gene expression (DE) and pathway enrichment analysis indicated that FAPs 5 were enriched in biological processes related to adipogenesis. To further characterize the nature of FAPs 5, pseudo-time analysis was performed, revealing a lineage progression from FAPs 1 through FAPs 2 to FAPs 5, suggesting that FAPs 5 possess the lowest hierarchical status. To identify the involving molecule of this populational shift, the downstream metabolic pathway regulated by HMG-CoA reductase was examined. As a result, we identified geranylgeranyl pyrophosphate (GGPP) as a crucial metabolite influencing FAP cell fate decisions. Co-treatment with GGPP and the HMG-CoA reductase inhibitor reversed the observed FAP population shift, highlighting GGPP's regulatory role in maintaining FAP subpopulation balance.
Conclusion: Our findings highlight the dynamic nature of FAP subpopulations and the critical role of the HMG-CoA reductase-regulated mevalonate pathway in influencing FAP cell fate. Specifically, geranylgeranyl pyrophosphate (GGPP) was identified as a key metabolite governing the observed population shifts, with its co-treatment effectively reversing these changes.

PO1.066

The Impact of Dietary Restriction of Individual Branched Chain Amino Acids on Their Plasma Levels in Rats

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Background: Abnormal levels of Plasma Branched-chain amino acids (BCAAs), comprising Leucine (Leu), Isoleucine (Ile), and Valine (Val), have been linked to various metabolic disorders. Therefore, dietary restriction of BCAAs is thought to mitigate these abnormalities. However, to our knowledge, the impact of BCAAs dietary restriction on their plasma concentrations remains unclear. The present study aims to investigate the effect of individual BCAAs dietary restrictions on their plasma levels.
Method: Adult Male Sprague-Dawley rats were randomly assigned into four dietary groups and observed for six weeks. The diets consisted of an Amino Acid-defined (AA) low-protein diet (~10% of calories from protein, Low P) and three low-protein diets (~10% of calories) with 75% deficiency individual BCAA: Leu, Val, or Ile (Low Leu, Low Val, and Low Ile, respectively). At the end of the study, blood samples were collected from the superior vena cava into ethylenediaminetetraacetic acid (EDTA) tubes for plasma AA profile assessment using high-performance liquid chromatography (HPLC).
Results: Maintaining the rats on low Leu diets for 6 weeks failed to significantly affect plasma Leu concentration as well as that of Val and Ile. Similarly, dietary Val restriction did not affect plasma BCAAs concentrations. However, dietary Ile restriction of 75% was able to significantly reduce plasma Ile and Val concentrations by about 30-35% as compared to the Low P group. Consequently, total BCAAs concentration of the Low Ile group was significantly lower than that of the Low P group.
Conclusion: Unlike the Low Ile group, the Low Val and Low Leu groups did not present substantial reductions in BCAAs compared to the Low P group. Thus, dietary restriction of Val and Leu may be associated with compensatory mechanisms to sustain their plasma concentrations, unlike that of Ile restriction. Hence, dietary intakes of BCAAs might not be the main determinant of their plasma amino acid levels.

Tab. 1. The effect of individual BCAAs deficiency on plasma amino acid concentrations in rats.

BCAAs (μmoles/L)	Low P (n=8)	Low Leu (n=8)	Low Val (n=7)	Low Ile (n=8)	p-value
Isoleucine	155.54±29.13 a	145.77±29.1 a	136.86±16.8 a, b	102.57±30.0 b	0.006
Leucine	240.45±43.48	227.32±51.58	231.36±22.84	180.87±51.21	0.056
Valine	281.80±54.55 a	261.91±45.18 a, b	253.63±32.1 a, b	201.81±64.6 b	0.027
Total BCAAs (μmoles/L)	677.79±127.55 a	635±122.55 a, b	621.85±60.01 a, b	485.25±34.0 b	0.019

a, b Mean ± Standard deviation values in the same row with different superscript letters were significantly different (Bonferroni post-hoc test, p<0.05)

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PO1.067

Dietary Restriction of Isoleucine, but not Leucine or Valine, Induced Anxiety-Like Behavior in Rats

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Background and Objective: Recent evidence from human and rodent studies indicated that diets low in branched-chain amino acids (BCAAs), including leucine (Leu), valine (Val), and isoleucine (Ile), enhance metabolic parameters such as glucose homeostasis, lipid metabolism, and energy balance (1). Despite these promising findings, the impact of reducing individual BCAAs on hippocampal-related functions remains unclear. At the central level, BCAAs play a role in the production of both excitatory and inhibitory neurotransmitters. Accordingly, we aimed to investigate the impact of dietary restriction of individual BCAAs on the neurobehavioral functions in rats.
Methods: Adult male Sprague-Dawley rats were randomized into four groups (n=8/group) and maintained on their respective diets for six weeks: a sham group (low-protein, ~10% of calories from protein) and three low-individual BCAA deficient groups (low-Leu, low-Ile, low-Val), in which the levels of Leu, Ile, or Val were reduced by 75% while maintaining ~10% of calories from protein. The impact of individual BCAAs deficiencies on hippocampal-related functions was assessed at week 6 using several behavioral tests, including Elevated Plus Maze (EPM) for anxiety-like behavior, Novel Object Recognition (NOR) for recognition memory, and Y-maze for spatial memory.
Results: Rats fed the low-Ile diet spent less time in the open arms of the EPM, indicating anxiety-like behavior. They also showed increased hyperactivity and significantly fewer freezing episodes during the NOR test, further confirming an anxiety-like response. In contrast, the low-protein, low-Leu, and low-Val groups did not exhibit anxiety-like behavior. Additionally, spatial memory, recognition memory, and exploratory behaviors were not significantly impacted by any of the dietary conditions.
Conclusion: Individual BCAAs deficiencies appear to have distinct behavioral effects, with low Ile intake being associated with anxiety-like behavior. Further research is needed to investigate the impact of these deficiencies at the central level, particularly their effects on neural stem cell proliferation and differentiation, growth factors, synaptic plasticity, and the underlying mechanisms involved.

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PO1.068

Cd36 regulates hepatic concentrations of ceramides and very long chain fatty acids: Correlations with blood pressure and lipolysis

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The SHR (spontaneously hypertensive rat) harbors a deletion variant of Cd36 (fatty acid translocase) gene identified as a genetic determinant regulating glucose and lipid metabolism and blood pressure. However, the mechanisms by which Cd36 affects metabolic and hemodynamic traits are unknown. In this study, we analyzed the liver metabolome to determine which metabolites are directly regulated by Cd36. Hepatic expression of Cd36 mRNA correlates with PC 37:1 (phosphatidylcholine) (r=0.57, p=0.00085), CL 70:7 (cardiolipin) (r=0.42, p=0.018), PE 36:1 (phosphatidylethanolamine) (r=0.61, p=0.00026), Cer 41:2;O2 (ceramide) (r=0.60, p=0.00036), Cer 41:1;O2 (r=0.59, p=0.00048), Cer 42:1;O2 (r=0.59, p=0.00048), PI 36:1 (phosphatidylinositol) (r=0.62, p=0.00020), FA 26:1 (fatty acid) (r=0.42, p=0.018), FA 32:1 (r=0.66, p=0.00006), FA 34:1 (r=0.68, p=0.000023). All these metabolites are closely linked as mQTL (metabolomic QTL) in the vicinity of the Cd36 gene. These results prove that the Cd36 gene directly regulates concentrations of these metabolites. All these metabolites significantly correlate with basal and stimulated lipolysis in epididymal adipose tissue and isolated adipocytes. In addition, ceramides and very long-chain fatty acids also correlate with blood pressure. While the role of ceramides in blood pressure regulation and lipolysis is well described, almost nothing is known about the role of very long-chain fatty acids in blood pressure regulation. These results provide new information on how Cd36 regulates lipid metabolism and blood pressure.

PO1.069

Mechanical forces induce PIEZO1 upregulation and inflammation in visceral adipose tissue in obesity

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Background: PIEZO1, a mechanosensitive ion channel, has been implicated in adipogenesis, adipose tissue (AT) inflammation and insulin resistance. We aimed to analyze the influence of obesity, obesity-associated type 2 diabetes (T2D), and mechanical compression forces on PIEZO1 expression in visceral AT (VAT) and its association with inflammatory pathways.
Methods: VAT samples were collected from 100 volunteers. Static compression experiments on VAT explants were conducted to evaluate the expression of PIEZO1 and genes involved in inflammation. A rat model of diet-induced obesity was used to examine changes in Piezo1 expression following bariatric surgery.
Results: Obesity and T2D significantly increased (P<0.01) PIEZO1 expression in VAT, predominantly in adipocytes. SWELL1 and key inflammatory markers, including NLRP3, NLRP6, IL1B, IL18, and IL8, were also upregulated and correlated (P<0.01) with PIEZO1 levels. Static compression of VAT explants resulted in a robust upregulation (P<0.01) of PIEZO1 and SWELL1, accompanied by increased inflammatory mediator expression and release. Rats undergoing bariatric surgery demonstrated reduced Piezo1 expression in epididymal AT (P<0.01).
Conclusions: Mechanical compression significantly increases PIEZO1 expression and inflammation in VAT. Obesity and T2D further upregulate PIEZO1 expression, particularly in adipocytes, in association with SWELL1 and inflammatory markers. These findings highlight the role of PIEZO1 in the mechanotransduction of VAT and its contribution to inflammation in metabolic disorders.

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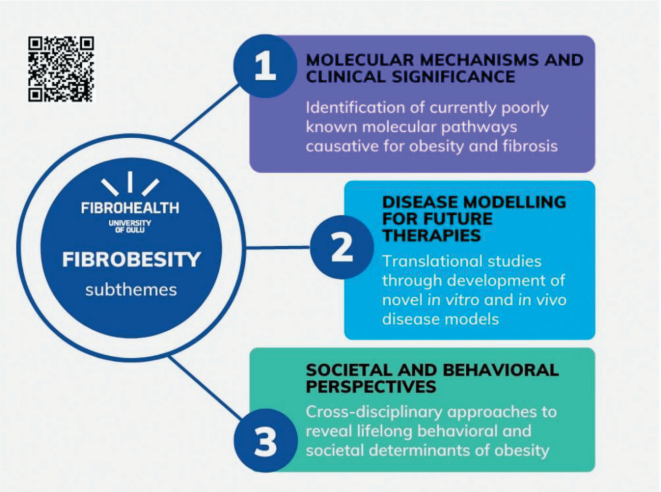
PO1.070

FIBROBESITY – Preventing Fibrosis Related to Obesity

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Introduction: Finland has been ranked among the top 10 countries regarding the prevalence of obesity resulting in severe burden both in societal and individual level. A large majority of the obesity-related diseases have a deleterious fibrotic component that is linked to inflammation, hypoxia-related mechanisms and/or degeneration processes, leading to pathological remodelling of the extracellular matrix (ECM) in the affected tissues. Given the strong pathologic effects of fibrosis in chronic diseases, it has been estimated to account for 45% of the mortality in Western countries with no effective therapies.
FIBROBESITY – Preventing Fibrosis Related to Obesity - is a multidisciplinary research programme at the University of Oulu. FIBROBESITY represents an innovative and interdisciplinary research area aimed at understanding and addressing the complex relationship between obesity and fibrosis in the context of chronic diseases.
GOAL: FIBROBESITY, built upon interlinkage between obesity and tissue fibrosis, focuses on medical and societal challenges of obesity-related fibrotic pathologies. The goal is to generate impactful new knowledge of the molecular, epidemiological, clinical and behavioral basis of fibrosis in complex chronic diseases and unhealthy ageing associated with obesity.
Methods: FIBROBESITY builds on administrative support framework and the research input of more than 100 research projects over several disciplines. World-class research at hypoxia and ECM together with cutting-edge clinical research, combined with our unique population and patient cohorts and state-of-the art research infrastructure, form the basis of FIBROBESITY. The research topics range widely from basic and translational research to human sciences, e.g. molecular mechanisms and disease modelling of hypoxia pathway, adipose tissue and mitochondrial dysfunction in metabolic syndrome, liver fibrosis, osteoarthritis, infertility, polycystic ovarian syndrome and cancer, to historical and sociocultural aspects as well as environmental and behavioral determinants of obesity. We are actively seeking new international partnerships and we invite postdoctoral scholars or professors from collaborating research institutions in any country to spend a research period up to 6 months at UOULU.
Results: FIBROBESITY has recruited more than 20 Tenure Track professors and earlier stage researchers. The follow-up for 2021-2024 shows positive results in terms of productivity and success in publications and EU funding. We have established close connections with the Finnish Association for the Study of Obesity (FASO), The Finnish Society for Matrix Biology and several other national scientific associations. The annual FibroHealth Symposia are regular events organized jointly with relevant stakeholders (example: www.oulu.fi/en/events/fibrohealth-symposium-2024).
Conclusion: Currently, FIBROBESITY focuses on establishing and supporting fruitful partnerships in the wider international research community to foster collaborative initiatives for a wider and stronger international scientific and societal impact in combatting obesity related adverse outcomes.



Infograph illustrating three sub-themes of the Fibrobesity programme, including QR code linking to the web pages of the wider FibroHealth umbrella, under which Fibrobesity operates at the University of Oulu.

Fig. 1. Fibrobesity sub-themes.

PO1.071

Vasorin modulates adipogenesis and metabolism in human adipocytes

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Introduction: Adipose tissue is essential for maintaining metabolic homeostasis, but obesity causes important changes in it, leading to serious metabolic alterations. Preliminary data from our research group show that the gene encoding vasorin (VASN), a transmembrane protein described as an inhibitor of angiogenesis and of the TGF-β signalling pathway (a pathway that is altered during obesity in adipose tissue), is differentially expressed in visceral adipose tissue of children and adults with obesity. Then, we aimed to study the function of vasorin in human adipocytes by knocking down its gene.
Methods: Human preadipocytes were transfected with a lentivirus which contained a sh-RNA, either shRNA-VASN or shRNA-control. Then, preadipocytes were differentiated into adipocytes for 12 days. The degree of differentiation was determined through Oil Red O staining, and the gene expression levels of VASN, peroxisome proliferator-activated receptor

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gamma (PPARγ), acetyl-CoA carboxylase α (ACACA) were assessed using real-time quantitative PCR. At day 10, cells were treated with TGFβ1 (100 μM) or TGFβ receptor inhibitor SB 431542 (100 μM) for 48 h. Protein levels of (phospho-, p) protein kinase B (PKB, also known as AKT), (phospho-) extracellular signal-regulated kinase 1/2 (ERK1/2), and (phospho-) mothers against decapentaplegic 2/3 (SMAD 2/3) were determined by western blot in the presence or absence of TGFβ1 and SB 431542, a TGFβ1 receptor inhibitor.
Results: Vasorin knockdown reduced lipid accumulation, and PPARγ and ACACA gene expression in human adipocytes. Nevertheless, incubation of TGFβ1 and SB 431542 did not change the levels of pSMAD, pERK and pAKT in VASN knockdown cells compared to control, indicating that the observed effects were not meditated by TGFβ1.
Conclusion: Vasorin regulates adipogenesis and metabolism in human adipocytes. Further analyses are needed in order to elucidate the mechanism in adipose tissue.

Conflict of Interest: None Disclosed.

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PO1.072

Serum myostatin in children with Prader-Willi syndrome

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Introduction: Myostatin (MST), cytokine of the transforming growth factor ß (TGFß) family, is a negative regulator of muscle mass. Additionally, serum MST increases in obesity and positively correlates with insulin resistance indices. Prader-Willi syndrome (PWS) is a rare congenital neurodevelopmental disorder characterized by growth hormone (GH) deficiency, bone metabolism disturbances, and hyperphagia, ultimately leading to significant obesity. The aim of this study was to analyze myostatin levels in children with PWS during treatment with GH and dietary intervention in comparison with healthy children.
Methods: Eighteen children with PWS (aged 1-16 years) and eighteen healthy children (BMI Z-score <-1+1>) of the same age were included. We determined the levels of serum myostatin (MST), leptin, soluble leptin receptor (sOB-R), insulin-like growth factor-I (IGF-I), and IGF-binding protein 3 (IGFBP3) by ELISA kits. Anthropometric measurements (body weight, height, body mass index - BMI) and dietary intake were assessed in all studied children. This study was approved by the Ethics Committee at the Institute of Mother and Child.
Results: Similar values of BMI and BMI Z-score were observed in both studied groups of children. The concentrations of MST and sOB-R were also similar in children with PWS and healthy subjects. Significantly higher values of leptin, leptin/sOB-R ratio, and IGF-I/IGFBP3 ratio were found in children with PWS in comparison with the healthy children ($p<0.05$). Positive correlation was observed between MST and leptin/sOB-R ratio in patients with PWS ($p<0.05$).
Conclusion: Our preliminary results concerning serum concentrations of MST, leptin, and soluble leptin receptor in children with PWS during GH treatment and dietary intervention may suggest the occurrence of relations between muscle and adipose metabolism in these patients.

Conflict of Interest: None disclosed.

Funding: No funding to report.

PO1.073

Protocol Abstract: Magnetic resonance quantified visceral adipose tissue, intra-hepatic fat, and cancer risk: A UK Biobank Study

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Background: Excess body weight and adiposity are associated with higher risk of at least 13 cancers. Evidence for these links is mostly based on anthropometric measures, such as body mass index (BMI) and waist circumference, which do not account for the role of fat distribution on cancer development.
Insulin resistance (IR) may be an important driver of obesity-related cancer development. Historically, visceral adipose tissue (VAT) has been considered the key driver for the development of IR, but Fabbrini et al. hypothesised that hepatic fat is in fact the primary driver of IR, with VAT merely a downstream correlate.
This large-scale study in the UK Biobank will assess links between IR, hepatic fat, VAT and the risk of obesity related cancers and determine whether IR is a mediator of any links between adiposity and cancer risk.
Methods: Using data from the UK Biobank (n = 502,134), we will:

1. Replicate and scale-up the Fabbrini study (N: 20 participants) to test the hypothesis that hepatic fat, rather than VAT, is the primary driver of obesity-associated metabolic derangements, approximated by IR. Propensity score matching will be applied to VAT and hepatic fat values to compare IR distributions in univariate and multivariable analyses.
2. Evaluate gender-specific associations between magnetic resonance-quantified VAT, subcutaneous adipose tissue (SAT), and hepatic fat with the incidence of obesity-related (ORC) and non-obesity-related cancers (non-ORC) using univariate and multivariable Cox proportional hazard models.
3. Investigate the role of IR as a mediator in the associations between SAT, VAT, hepatic fat, and cancer incidence (categorised into ORC and non-ORC).

Results from Preliminary Analysis: Of the total participants recruited to the UK Biobank (2006 – 2010), 55,976 (11.15%) have undergone a follow-up whole-body MRI Scan (2014 to 2024), with SAT, VAT and hepatic fat values calculated. Participants who attended these scanning visits were younger (median age: 55 vs. 58 years, $P<0.001$), had a lower median BMI (26.02 vs. 26.84 kg/m^2, $P<0.001$) and showed lower deprivation levels (median Townsend Deprivation Index: -2.59 vs. -2.06, $P<0.001$) compared to the overall cohort. These findings highlight the need to consider selection bias in this analysis.
Median VAT, SAT, and hepatic fat values were progressively higher across BMI categories, with males showing higher VAT and hepatic fat levels than females at all BMI levels, demonstrating the importance of stratifying the analyses by gender.
Anticipated Value of the Research: This will be the first large-scale study to identify the specific determinants of fat deposits influencing IR and to quantify their role in the development of ORCs, enhancing our mechanistic understanding of this process. These findings will be key for areas of deprivation within the UK, where obesity levels are well above the national average, with the results helping to inform national cancer prevention strategies.

Conflict of Interest: None disclosed

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PO1.074

Early-life dietary galactose decreases proximal small intestinal fatty acid oxidation while enhancing systemic fatty acid oxidation in fed post-weaning female mice

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Introduction: Replacing part of dietary glucose with galactose in the early-life post-weaning diet in mice, mimicking lactose and thus extended breastfeeding, has been shown to improve both short- and long-term physiological and metabolic health parameters including reduced obesity upon an obesogenic diet [1-3]. As the primary organ in nutrient absorption, we hypothesized the small intestines to be the main organ underlying the observed effects.
Methods: We investigated, therefore, the effects of a 3-weeks isocaloric galactose+glucose versus control glucose intervention (totalling 32energy% of total dietary energy on standard background [3]) in young, just weaned mice on metabolic and physiological parameters, with detailed analyses in females only, including proximal small intestine RNASeq transcriptomics and immunohistochemistry of fed mice.
Results: The inclusion of dietary galactose showed an increase in relative fatty acid oxidation (%FAO) versus carbohydrate oxidation based on lower whole-body 24-hour respiratory exchange ratio in females, without differences in body weight in both sexes, and energy expenditure in females. Also whole-body absolute FAO appeared to be increased. Contrasting, the proximal small intestine displayed a consistently lower expression of transcripts involved in FAO without effects on carbohydrate metabolism. Fewer enterocytic lipid droplets were seen, suggesting an increased involvement of proximal intestines in the lipid flux into circulation. In line with the decreased intestinal FAO, the expression levels of NADPH-independent and NADPH-dependent antioxidant enzymes were lower, including a decreased pentose phosphate pathway without alterations in lipid synthesis. The liver, the canonical organ involved in galactose metabolism, lacked galactose metabolic and lipid catabolic alterations, suggesting other organs are responsible for the increase in whole-body FAO.
Conclusion: Replacing half of post-weaning dietary glucose with galactose, mimicking continuing and prolonged lactose intake, has profound effects on substrate metabolism at both the systemic and small intestinal levels. We propose that galactose induced a lower local enteric FAO facilitating increased systemic, extra-hepatic FAO, which might underly the beneficial effects seen.

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PO1.075

LATS kinase silencing impairs brown adipocyte thermogenic activity

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Introduction: Brown adipocytes, the functional units of brown adipose tissue (BAT), rely on tightly regulated signalling networks driving their thermogenic activity. The large tumor suppressor (LATS) kinases are central regulators of the Hippo signalling pathway, modulating its key effectors, transcriptional co-regulators YAP1 and TAZ, which influence cellular processes like proliferation, differentiation and apoptosis, and thereby control the organ size. Emerging evidence links this pathway to the thermogenic activity of BAT, critical for energy homeostasis and heat production. However, the role of LATS kinases in regulation of nonshivering thermogenesis remains unclear. Therefore, we aimed to investigate the role of LATS kinases in regulation of brown adipocyte function and thermogenesis.
Methods: We used siRNA-mediated knockdown to silence Lats1, Lats2, and their combined suppression (Lats1&2) in immortalised murine brown adipocytes, assessing the impact on adipocyte marker genes, UCP1 protein levels (a thermogenic marker), lipolytic activity, lipid droplet accumulation, and mitochondrial functionality. These analyses provided insights into the molecular consequences of LATS kinase disruption in vitro. To complement this, we created inducible brown adipocyte-specific Lats1&2 double knockout (Lats1fl/fl x Lats2fl/fl x Ucp1-CreERT2) mice to study the physiological role of LATS kinases in the control of BAT activity in vivo. We evaluated how LATS kinase loss affects BAT thermogenesis, lipid metabolism, and energy homeostasis. By combining in vitro and in vivo approaches, this study offers a detailed examination of LATS kinases' role in regulating brown adipocyte functionality.
Results: Our findings revealed that suppressing Lats2 and both Lats1&2 kinases simultaneously leads to a decrease in the expression of brown adipocyte gene markers, UCP1 protein levels, and hormone-sensitive lipase phosphorylation, accumulation of neutral lipids in fat droplets, and mitochondrial respiration in cultured murine brown adipocytes in vitro. However, suppression of Lats1 expression had no effect on the measured parameters of brown adipocyte activity. Furthermore, the knockdown of Lats1&2 kinases in BAT of mice in vivo led to a reduction in the mass of interscapular BAT and the expression of Pparg. In addition, we observed a decrease in UCP1 and Perilipin 1 levels in BAT of cold-acclimated mice, suggesting reduced thermogenic activity. Metabolic phenotyping of this unique mouse model revealed a significant reduction in energy expenditure.
Conclusion: Our preliminary findings suggest that LATS kinases, particularly LATS2, are crucial for the proper function of brown adipocytes. These results highlight LATS2 as a potential regulator of signalling pathways essential for nonshivering thermogenesis and BAT activity. This research provides new insights into energy metabolism regulation.

PO1.076

One Anastomosis Mini-Gastric Bypass Decreases Desacyl Ghrelin and Improves Metabolic Profile in Rats with Diet-Induced Obesity

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Introduction: The potential participation of acylated (AG) and desacyl (DAG) ghrelin in insulin resistance improvement following one anastomosis mini-gastric bypass (MGB) remains unknown. This study compares

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the efficacy of MGB and caloric restriction in the treatment of obesity and studies the relationship between ghrelin isoforms and insulin sensitivity post-intervention.
Methods: A total of 37 male Wistar rats with diet-induced obesity (DIO) were submitted to either sham surgery (n=11), MGB (n=6)] or dietary interventions [fed ad libitum a normal diet (n=6), a high-fat diet (n=6) or pair-fed to the amount of food eaten by MGB rats (n=8)].
Results: MGB surgery resulted in significant and sustained weight loss, supported by lower body weight (P<.01) and total adiposity compared to sham-operated and pair-fed controls (P<.05 for all). Although MGB did not lead to significant differences in relative food intake, it induced lower food efficiency ratio (P<.01), higher rectal temperature (P<.05), and increased *Pgc1a* gene expression levels (P<.05) in brown adipose tissue, suggesting an improved energy expenditure. MGB also ameliorated insulin sensitivity, as evidenced by decreased plasma glucose (P<.05), insulin (P<.01) and HOMA-IR (P<.05) compared to caloric-restricted rats, without affecting the lipid profile. Plasma DAG levels significantly decreased (P<.05) one month after MGB, and significant correlations were observed between DAG and markers of insulin resistance, including insulin, HOMA-IR, leptin, and Adipo-IR.
Conclusion: This study demonstrates that MGB leads to significant improvements in body composition and metabolic profile through mechanisms beyond caloric restriction. The effects appear to be mediated by changes in energy expenditure and adipose tissue function, potentially modulated by alterations in the gut hormone DAG.

PO1.077

MiR-494: A Molecular Link Between Exercise and Mitochondrial Biogenesis in Skeletal Muscle

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Introduction: Physical inactivity increases the risk of various health conditions, including obesity and type 2 diabetes (T2D). Exercise induces molecular adaptations in skeletal muscle, improving glucose uptake, oxidation, glycogen storage, fatty acid oxidation, and mitochondrial biogenesis, ultimately improving insulin sensitivity. Additionally, exercise impacts muscle microRNAs (miRNAs), key regulators of physiological processes. MiR-494 in skeletal muscle influences metabolism and functional capacity, modulating mitochondrial biogenesis. This study investigates the regulation of miR-494 in skeletal muscle and circulation by exercise training and its functional role in human skeletal muscle cells.
Methods: Fourteen middle-aged individuals with overweight/obesity and metabolic syndrome participated in a 12-week supervised exercise training program. MiR-494 levels were measured in skeletal muscle and serum both before and after the training. Acute exercise effects on muscle miR-494 levels were analysed in trained individuals. The effects of miR-494 manipulation were tested in vitro using specific mimics and inhibitors in primary human skeletal muscle cells and in mice *in vivo* by injecting miR-494 inhibitors into *tibialis anterior* muscle. Functional parameters, including gene expression, protein levels, lipid accumulation, and mitochondrial respiration, were measured.
Results: Exercise training increased VO_2 max by 23% and reduced waist circumference by 3.3%, without altering other metabolic parameters. Resting skeletal muscle miR-494 levels decreased by 28% post-training, while serum miR-494 levels increased. Acute exercise did not affect miR-494 levels in muscle or serum. MiR-494 was not significantly regulated in the skeletal muscle of patients with obesity, prediabetes, or T2D, however, serum miR-494 levels tended to decrease in patients with T2D. Muscle cells from patients with obesity, prediabetes, or T2D, as well as palmitate treated cells, showed no regulation of miR-494. MiR-494 mimics reduced the expression of genes and/or proteins associated with mitochondrial biogenesis (PGC1A, SIRT1, SIRT3, FOXJ3), decreased mitochondrial content and respiratory function, and increased lipid accumulation in myotubes. In contrast, inhibition of miR-494 had the opposite effects, increasing PGC1A and SIRT1 expression and respiratory function, and decreasing lipid accumulation. *In vivo*, miR-494 inhibition tends to increase *Pgc1a* mRNA levels in murine *tibialis anterior* muscle.
Conclusion: MiR-494 acts as a repressor of mitochondrial biogenesis and activity in human skeletal muscle cells, with its levels modulated by long-term exercise training. While miR-494 inhibition enhanced mitochondrial function, further studies are needed to establish its physiological relevance and potential for treatment of metabolic disorders.

PO1.078

Beta-hydroxybutyrate reduces body weight by modulating fatty acid oxidation and thermogenesis in the subcutaneous adipose tissue of DIO mice

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Introduction: Ketone bodies (KBs), particularly β-Hydroxybutyrate (BHB), have gained significant attention as alternative energy sources due to their potential benefits in regulating body weight and glucose levels. While their positive effects are well-documented in various studies, the precise molecular mechanisms underlying these benefits remain incompletely understood.
Objective: To investigate the impact of BHB supplementation on subcutaneous adipose tissue (SAT) function and body weight regulation in a diet-induced obesity (DIO) mouse model.
Methods: Adult male mice were fed a high-fat diet (60%) for 6 weeks to induce obesity. After this period, mice were transitioned to a standard diet, with one group receiving β-Hydroxybutyrate (BHB) supplementation (163.8 g/L) via drinking water for an additional 6 weeks. At the study's endpoint, SAT was analyzed using RT-qPCR and RNA sequencing, with key findings validated by Western blotting. Serum metabolite profiling was also conducted to assess systemic metabolic changes.
Results: BHB supplementation significantly reduced weight gain in DIO mice, independent of food intake. Serum metabolite analysis revealed elevated pyruvate and citric acid levels, alongside a marked reduction in branched-chain amino acids (BCAAs), suggesting a metabolic shift toward optimized energy utilization. In SAT, BHB decreased both gene and protein expression of thermogenic markers, including Peroxisome Proliferator-Activated Receptor Gamma (PPARγ) and Uncoupling Protein 1 (UCP1). RNA sequencing further identified the upregulation of genes involved in long-chain fatty acid β-oxidation (e.g., Slc27a2, Plin5, Acot4, and Acsm3), indicating enhanced lipid mobilization and mitochondrial activity.
Conclusion: These findings uncover a novel role for BHB in modulating lipid turnover and β-oxidation within SAT, independent of thermogenic pathways. By optimizing fatty acid metabolism and mitochondrial function, BHB supplementation may contribute to the observed reductions in weight gain, offering new insights into its therapeutic potential for obesity and metabolic disorders.

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Conflict of Interest: None Disclosed

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PO1.079

Osteosarcopenic Adiposity in Postmenopausal Patients with Breast Cancer on Adjuvant Endocrine Therapy

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Introduction: Ostesarcopenic adiposity syndrome (OSA) refers to the coexisting impairments of bone tissue (osteopenia/osteoporosis), muscle mass (sarcopenia), and adipose tissue expansion, which negatively affects quality of life and overall health. The use of adjuvant endocrine therapy in patients with breast cancer (BC) can adversely affect body composition and potentially contribute to the development of OSA. Since the parameters of OSA are treatable, early detection is crucial. The aim of our study was to analyze body parameters and assess the presence of OSA in postmenopausal women with BC undergoing adjuvant endocrine therapy.
Methods: The study included 43 postmenopausal women with BC, aged 46-71 years, who were receiving adjuvant endocrine therapy: aromatase inhibitors (n=38) or tamoxifen (n= 5), for 1-5 years. Bioelectrical impedance device BIA-ACC® was used for measurement of the total bone mass, parameters of muscle and adipose tissue, as well as total and extracellular body water. The comprehensive classification for OSA encompassed participants who exhibited the concurrent presence of osteopenia or osteoporosis (T-score of ≤−1.0), sarcopenia (S-score of ≤−1.0), and obesity or adiposity (total fat mass ≥32% for females).
Results: The osteopenia/osteoporosis was diagnosed in 29 women, sarcopenia in 27, while excess adipose tissue was found in 38 patients with BC. OSA was diagnosed in 22 participants in this study. The indicator of tissue integrity, phase angle (normal >3.5%), was low in 41 women. Extracellular water (% of total body water, normal <40%), indicating inflammation, was elevated in 41 women as well.
Conclusion: Our study demonstrated the presence of OSA in 51.2% postmenopausal women with BC on adjuvant endocrine therapy, along with altered tissue integrity and inflammation parameters in 95.3% of participants. These findings highlight the importance of body composition screening and treatment in women receiving adjuvant endocrine therapy for BC.

PO1.080

Characterisation of peptide agonists' binding affinity and kinetics at amylin receptors

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Introduction: Amylin (AMY) is a pancreatic hormone that acts on centrally located receptors to induce satiation. Amylin receptors (AMYRs) are heterodimers formed by the class B1 G protein–coupled receptor (GPCR) calcitonin receptor (CTR) and one of the three receptor activity–modifying proteins (RAMP1–3). Currently, our knowledge of how different RAMP isoforms influence the kinetics of ligand/receptor interactions remains scarce. Furthermore, most published studied have only tested a handful of peptides in binding assays, with AMY2R frequently omitted. Measuring the affinities and association/dissociation rates of a wide range of agonists at all three AMYRs will enable the elucidation of structure–activity relationships, thus helping the development of a novel class of anti–obesity medications.
Methods: AMYRs were reconstituted by co–transfecting HEK293T cells with NanoBiT split luciferase system components fused to the N–termini of CTR (LgBiT–CTR) and individual RAMPs (SmBiT–RAMP1/2/3), thus ensuring that only CTR/RAMP dimers possess a functional luminescent tag. The binding parameters of Cy5–labelled salmon calcitonin (Cy5–sCT) were established in a BRET–based saturation assay; subsequently, the displacement of Cy5–sCT by increasing concentrations of non–fluorescent ligands was used to calculate their affinities and on–/off–rates.
Results: Obtaining a functional AMY2R required HEK293T cells to be transfected with a higher RAMP: CTR ratio (4:1) compared to other AMYRs (2:1). Similar to its unlabelled counterpart, Cy5–sCT had a similar affinity at all receptors of interest. However, some kinetic parameters differed between AMYR subtypes – for instance, the association rate at AMY3R was faster than at AMY1R. Established CTR/AMYR agonists and various investigational compounds showed a wide range of dissociation and rate constants. Residues responsible for CTR vs. AMYR selectivity, or bias towards individual AMYR subtypes, were identified by analysing the binding profiles of pramlintide Ala scan peptides.
Conclusion: The use of a NanoBiT split luciferase system in conjunction with a BRET–based binding assay enabled a comprehensive characterisation of peptides' binding to AMYRs, revealing differences in both selectivities and kinetic parameters. Further research should look at the intracellular signalling downstream of the ligand/receptor interaction, as well as examine whether the binding kinetics of an agonist and its physiological actions (e.g. appetite suppression or weight loss) are correlated.

PO1.081

Time-restricted feeding improves metabolic parameters and restores circulating corticosterone's circadian rhythm in male mice fed a high-fat high-sucrose diet

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Introduction: Intermittent fasting has been proposed as an alternative strategy to promote weight loss and improve metabolic health in the context of obesity and its associated metabolic diseases. Time-restricted feeding (TRF) is the simplest form of intermittent fasting and involves limiting the feeding window to 8-10 hours per day. TRF may facilitate adherence to this dietary pattern and mitigate the stressful effects of continuous energy restriction. Yet, little is known about the impact of TRF on stress and anxiety, key factors in maintaining this intervention.
Aim: To study the effect of TRF on metabolism (body weight and glucose tolerance), stress (total corticosterone levels and circadian pattern) and anxiety in mice subjected to a high-fat, high-sucrose (HFS) diet in both sexes.
Methods: Eight-week-old male and female mice were fed for 12 weeks a control or a HFS diet under two food access approaches: ad libitum or TRF. Food restriction was applied 16 hours per day, coinciding with the inactive phase of the mice. Body weight was measured daily, and a glucose tolerance test was performed at 10 weeks of diet. Total corticosterone accumulated in hair during the experimental period and plasma corticosterone collected at 8 a.m. and 8 p.m. were quantified. The elevator plus maze test (EPMT) was performed to evaluate the anxiety of the mice.
Results: Male mice under HFS diet and TRF showed reduced body weight, white adipose tissue weight, and improved glucose tolerance compared to

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the HFS diet ad libitum group. However, in females, only the TRF group under the control diet decreased body weight.
Neither HFS nor TRF interventions altered hair corticosterone levels. However, higher hair corticosterone levels were observed in females compared to males. Importantly, in males, TRF was able to restore the HFS diet-induced loss of circulating corticosterone's circadian rhythm. Finally, TRF did not alter anxiety levels neither in males nor in females.
Conclusions: TRF prevents body weight gain, improves glucose tolerance and restores circulating corticosterone's circadian rhythm in males fed a HFS diet. Thus, TRF does not induce stress nor anxiety in mice under HFS diet, since 1) mice subjected to TRF did not increase free corticosterone levels 2) in males, TRF was able to restore the HFS diet-induced loss of circulating corticosterone's circadian rhythm, and 3) TRF did not alter anxiety levels measured with the EPMT neither in males nor in females. Altogether, our results highlight TRF as an alternative approach to promote weight loss and improve metabolic health without alterations in stress and anxiety.

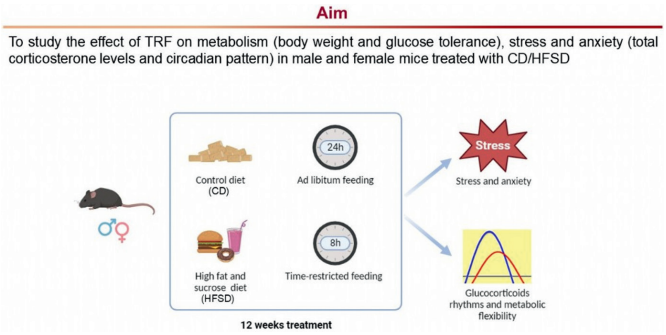


Fig. 1. Aim.

PO1.082

Modeling pediatric obesity by developing *in vitro* adipogenesis using MSCs from pediatric subcutaneous adipose tissue

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Introduction: Childhood obesity represents an alarming health challenge as children with obesity are prone to display with obesity throughout their life in association to an increased morbidity and mortality risk[1]. In addition, adipose tissue, besides its central role in the development of obesity and its related complications, is important to maintain metabolic homeostasis[2]. Despite several in vitro models of adipogenesis has been proposed for adult cells, the presence of standardized models using pediatric mesenchymal stem cells (MSCs) have not been reported yet. This study aims to set up and validate an in vitro protocol to obtain differentiated adipocytes from MSCs derived from pediatric adipose tissue biopsies (pATB) to model adipogenesis in pediatric normal weight and obesity conditions.
Methods: MSCs were isolated from periumbilical white subcutaneous adipose tissue, surgically collected from male pediatric subjects with normal weight and obesity, and were treated up to 14 days with either one of three differentiation media (called thereafter A, B and C). The three media differ for the concentration of pro-adipogenic factors such as insulin, IBMX, dexamethasone and indomethacin. Media toxicity was evaluated with the Live&Dead assay. Adipogenesis was assessed with bright field microscopy and fluorescent staining analysis for lipid droplets accumulation. Furthermore, the expression of adipogenic markers and of genes involved in lipid metabolism was determined by RT-qPCR and WB analysis, while the cells' metabolic activity was assessed by MTT assay.
Results: Both the staining and gene expression analysis of adipogenesis markers (i.e. PPAR gamma and FABP4) revealed that media A and B have a comparable effect on inducing adipogenesis in cells derived from normal weight subjects and subjects with obesity. Furthermore, the highest level of adipogenesis was observed between day 7 and 14 of treatment and the FABP4 mRNA levels significantly increase upon differentiation in both subject groups. In addition, upon 14 days of treatment a decreased metabolic activity and an altered expression of genes involved in lipid metabolism were observed. On the other hand, media C did not induce adipogenesis, resulting in complete absence of lipid droplets accumulation.
Conclusions: Our results demonstrate, for the first time, an efficient method to differentiate pediatric MSCs from pATB (from normal weight and subjects with obesity) and to obtain in vitro pediatric adipocytes, indicating FABP4 the most reliable differentiation marker. Model A was chosen for morphological and molecular analysis of adipocytes from normal weight children and pediatric subjects with obesity, giving insights about lipid metabolism in conditions of obesity and normal weight. Even if a deeper characterization is needed to better define this model, it will enable further research on pediatric obesity and its molecular implications.

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PO1.083

Resistance training improves pancreatic beta-cell function via a metabolite released in the bloodstream

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Introduction: Resistance training benefits beta-cell function and survival in healthy mice and in mice with type 1 diabetes, which is mediated by exercise-induced humoral factors released in the bloodstream. Here, we fractioned the serum from resistance-trained mice to identify this blood-borne molecule.
Methods: For this, we used two groups of C57BL/6 mice: control (CON) and resistance-trained (RT). RT mice performed 1 training session/day, 5 days/week for 10 weeks. Each session consisted of 8 climbs at 4 different loads (50, 75, 90, and 100% of the maximal voluntary carrying capacity of each mice). The blood was collected to obtain the serum, which was used in *in vitro* experiments. A rat pancreatic beta-cell line (INS-1E) was incubated for 24h with medium containing 10% of full serum (from CON or RT mice) or serum fractions (>100, 50, 30, 10, 3, and <3 kDa), obtained by a nominal molecular mass limit (NMWL) filter. Additionally, INS-1E cells were incubated for 24h with medium containing 10% of full serum (from CON or RT mice) or with deproteinized serum (treated with proteinase K). We analyzed insulin secretion and gene expression of *Ins2*. Data are mean ± SEM, $P \leq 0.05$ (Student's T test or One-Way ANOVA with Tukey's post-hoc test).
Results: INS-1E cells treated with trained-serum secreted more insulin ($p<0.0001$) and presented higher gene expression of *Ins2* ($p=0.0023$) than cells treated with control-serum. The fraction of the trained-serum that mediates these effects is lower than 3 kDa (insulin secretion $p=0.0181$; *Ins2* expression $p<0.001$). Moreover, the effects of trained-serum on gene expression of *Ins2* were not abrogated by serum deproteinization ($p=0.0043$), suggesting that the molecule mediating the benefits of resistance training on beta-cells is not a protein or does not require a protein to execute its function.

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Conclusion: Taken together, these findings suggest that the blood-borne molecule mediating the effects of resistance training on beta-cell function may be a metabolite. Therefore, metabolomic analyses are ongoing in order to identify this molecule.

PO1.084

A Metabolomic Signature of Maternal BMI is Associated with Pregnancy Complications: Insights from the COPSAC2010 and VDAART Mother-Child Cohorts

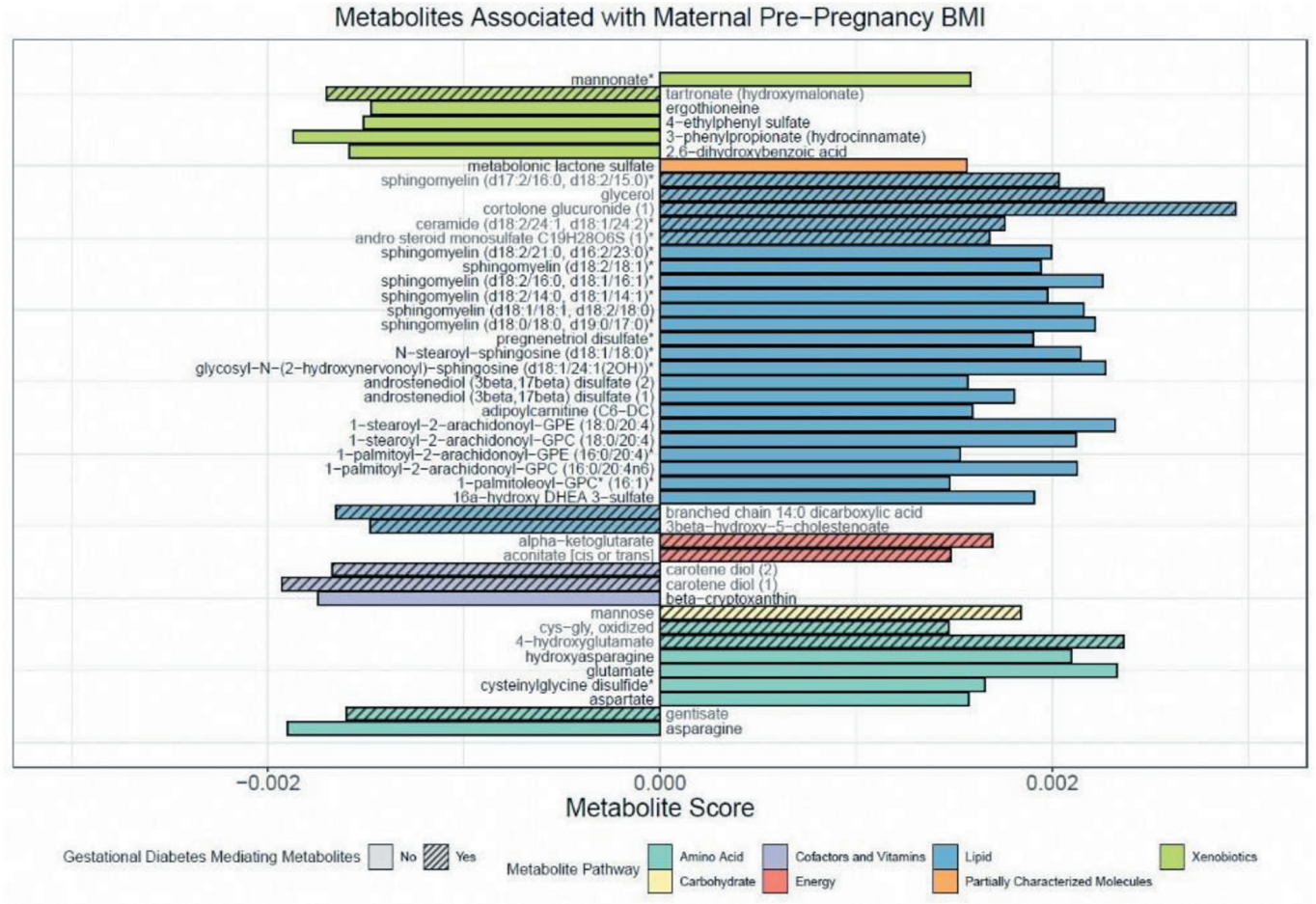
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Introduction: Pregnancy complications such as gestational diabetes, preeclampsia, and caesarean section are more common among individuals living with higher BMI, likely due to metabolic disturbances. Blood metabolomics may offer mechanistic insights into these disturbances.

Methods: This study utilised data from the COPSAC2010 (n=684) and VDAART (n=881) mother-child cohorts, leveraging untargeted blood metabolomics and machine learning to investigate the association between pre-pregnancy BMI and pregnancy complications. A BMI-metabolite score was trained in the COPSAC2010 cohort and externally validated in VDAART.

Results: In the COPSAC2010 cohort, individuals with higher pre-pregnancy BMI (per 1 SD increase) had increased odds of gestational diabetes (OR 1.90, p<0.001), caesarean section (OR 1.23, p=0.023), and birth induction (OR 1.42, p<0.001). A BMI-metabolite score predicted preeclampsia (OR 1.54, p=0.030) and other pregnancy complications more effectively. The metabolite score trained in the COPSAC2010 cohort demonstrated strong predictive capacity for maternal BMI in the VDAART cohort during early (β 4.62, $p=10^{-63}$) and late gestation (β 4.26, $p=10^{-54}$). Validation in VDAART confirmed the metabolite scores predictive value for gestational diabetes (OR 2.10, p<0.001) and preeclampsia (OR 2.12, p=0.002). Mediation analysis, trained in the COPSAC2010 cohort, identified 16 metabolites mediating BMI's link to gestational diabetes. These mediators showed stronger predictive value for gestational diabetes in VDAART during early (OR 1.81, p<0.001) and late gestation (OR 2.26, p<0.001) than the full-metabolite score. Figure 1 provides detailed insights into BMI-associated metabolites and their pathways.



This figure illustrates the results from a supervised machine learning analysis (sparse partial least squares modelling) applied to untargeted blood metabolomics data collected at 24 weeks gestation in the COPSAC2010 cohort. Out of 640 potential metabolites, 46 were selected for their ability to predict maternal pre-pregnancy BMI. The bar plot ranks these metabolites by their scores, with colours representing different metabolite pathways and patterns indicating whether they mediate the association between maternal BMI and gestational diabetes (striped for mediators, solid for non-mediators). Pathway enrichment analysis revealed significant enrichment in sphingomyelin and Vitamin A metabolism (FDR <0.05). Some metabolites, such as carotene diol and gentisate, appear protective, while others like ceramide and sphingomyelin may increase gestational diabetes risk.

Fig. 1.

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Conclusion: Metabolomic profiling enhances understanding of how higher BMI during pregnancy may impact complications, offering opportunities for personalised risk assessment. These findings underscore the value of integrating metabolomics into prenatal care to optimise maternal and child health outcomes.

PO1.085

Influence of fibrosis on adipose miRNA secretome: an untargeted analysis

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Introduction: Fibrosis is a hallmark of adipose tissue (AT) dysfunction, a major contributor of obesity-associated metabolic diseases. Early AT dysfunction diagnosis may be crucial for obesity co-morbidities prevention and treatment, but there are no current therapeutic tools for this purpose. microRNAs (miRNAs), small non-coding RNAs that regulate gene expression, are also secreted into the circulation and emerge as novel paracrine/endocrine mediators and putative extracellular biomarkers of tissue functional state. The adipocyte miRNA secretome under fibrotic conditions has not yet been fully established. This information might be useful for a comprehensive knowledge of the biological processes taking place during AT fibrosis and to define novel therapeutic targets for the treatment of obesity and associated diseases.
Methods: Three-dimensional (3D) in vitro culture models of 3T3-L1 adipocytes based on collagen I (COLI) hydrogels alone (control) or containing other AT extracellular matrix (ECM) components known to be modified in obesity and insulin resistance [i.e., collagen VI (COLVI) and/or the proteoglycan, lumican LUM] was employed to mimic AT fibrosis. Culture media were collected and a miRNA untargeted analysis by GeneChip miRNA 4.0 arrays (Applied Biosystem) of the adipocyte secretome was performed. Differentially secreted miRNAs were validated by qPCR. An in silico functional and enrichment analysis of miRNA target genes was carried out to unveil the biological processes involved in adipocyte response to fibrosis. Further regulation of the expression of selected miRNAs by other obesogenic insults (inflammation and exposure to high glucose or fatty acid concentration) was also investigated.
Results: COLVI was the ECM component that led to major changes in adipocyte miRNA secretome in the 3D models assayed. The secretion of 20 miRNAs was increased and 8 miRNAs was decreased in response to COLVI alone or in combination with LUM as compared to control. Seven out of the 8 down-regulated miRNAs were exclusively identified in the supernatant of models containing COLVI alone. COLVI also specifically increased the secretion of 5 miRNAs compared to LUM. LUM alone did not have significant effects on adipocyte secretome as compared to control. Enrichment analysis of validated miRNA target genes showed that differentially secreted miRNAs upon COLVI challenge were involved in collagen biosynthetic processes, inflammatory response, response to glucose and carbohydrate stimuli, and fat cell differentiation. Moreover, miRNA target genes were also involved in muscle, vascular and pancreas regulation.
Conclusion: Changes in ECM composition in response to obesity defines the miRNA secretion profile of adipocytes. Specifically, COLVI led to major changes in secreted miRNAs related to biological processes relevant for AT homeostasis. These miRNAs might also act as endocrine mediators and could serve as biomarkers of AT (dys)function.

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PO1.087

Transgenerational Inheritance of Obesity Phenotypes: Insights from Small Non-Coding RNAs

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Introduction: Children with obesity is a pressing public health concern, linked to co-morbidities such as type 2 diabetes, cardiovascular disease, and certain cancers. While heritability estimates range from 40–70%, depending on parents living with obesity, genetic variation accounts for less than 8% of this inheritance. This highlights the significant role of non-genetic factors, particularly epigenetic mechanisms, in the transmission of obesity risk. Environmental influences and lifestyle choices are key drivers of these epigenetic changes, emphasizing the need for research into their role in childhood obesity.
Methods: We previously developed a mouse model of children with obesity by inducing an environmental challenge (i.e. reducing litter size). In the Small Litter (SL) group, we culled the offspring to 4 pups per mother during lactation, while the Control group maintained 8 pups per mother. SL mice displayed overweight, obesity, and insulin resistance as they aged. This procedure was repeated across three consecutive generations (F0 to F2). Remarkably, the obese traits persisted for three additional generations (F3 to F5) along the paternal lineage, even in the absence of the environmental challenge. These findings suggest that adiposity is inherited through non-genetic mechanisms, likely involving germline epigenetic processes.
To explore this further, we focused on the potential role of small noncoding RNAs (sncRNAs) (length 10-64 nt), including microRNAs (miRNAs), piwiRNAs (piRNAs), and transfer RNA fragments (tRFs). all of them have been previously involved in the inheritance of metabolic diseases. We collected mature sperm from the cauda epididymis of 4-month-old Control and SL mice, then extracted total RNA and sequenced the sncRNAs.
Results: Interestingly, variations in sncRNAs were primarily observed in the exposed individuals (F0-F2). Specifically, mild perturbations were seen in tRFs and piRNAs, which were mainly confined to the exposed groups, potentially contributing to intergenerational inheritance. In contrast, miRNAs exhibited more significant variation, not only in response to environmental challenges but also among non-exposed individuals. This suggests that miRNAs may play a role in both intergenerational and transgenerational inheritance of metabolic dysregulation. Additionally, we found that a substantial portion of the adipose tissue transcriptome is potentially regulated by miRNAs. Based on these findings, we speculate that these molecules may act as carriers of epigenetic information in our model, facilitating the inheritance of metabolic traits across generations.
Conclusion: We found that the male germline epigenome is particularly sensitive to environmental challenges, such as nutrition and obesity-related metabolic changes. While all sncRNAs showed some response to these environmental cues, only miRNAs were consistently dysregulated across all five generations. This suggests that miRNAs may play a key role in the inheritance of metabolic diseases in our model.

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PO1.088

Intra- and inter-observer reliability for the assessment of upper leg skeletal muscle and subcutaneous fat using ultrasound in individuals with severe obesity

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Background: Severe obesity is commonly associated with chronic inflammation and intramuscular fat infiltration, highlighting the importance of assessing muscle quality. Ultrasound is a practical, non-invasive method for muscle assessment but requires a standardized protocol and adequate training. Evaluating the magnitude of measurement error is crucial to ensure that results are reproducible and independent of researcher subjectivity. This study aims to assess the intra- and inter-observer reliability of ultrasound for evaluating upper leg skeletal muscle and subcutaneous fat in individuals with severe obesity.
Methods: Adults with severe obesity (BMI > 40 kg/m^2) were randomly selected (~25%) from the participants of a randomized clinical trial (MACRO study). Ultrasound exams were conducted in individuals in supine position at rest for 15 minutes. Triplicate images were captured in transverse position, with a standard preset, using a GE Logiq P8 with a linear transducer (3-12 MHz).Two trained researchers evaluated the thickness of the rectus femoris muscle, quadriceps and subcutaneous fat, as well as cross-sectional area (CSA) of the rectus femoris muscle. In addition, muscle echogenicity was assessed using CSA and a standard 1 cm diameter region of interest (ROI) of the rectus femoris. The mean of the measurements from the three images was used for inter-observer analysis. For intra-observer reliability, a blind test of ultrasound images was performed and then analyzed on three different days by the same researchers. The difference between the two researcher's measurements was evaluated using the Student's t-test. For reliability assessment, the intraclass correlation coefficient (ICC) was considered. Researchers' agreement was evaluated using Bland-Altman plots.
Results: Individuals (7 women and 3 men) had a mean age of 33 ± 7.5 years and a BMI of 49.7 ± 5.3 kg/m^2. Mean absolute values for all measures did not show statistically significant differences between researchers, except for quadriceps thickness (bias = 0.138 ± 0.9 cm; p = 0.002). For both researchers, the intra- observer tests were classified as excellent (ICC > 0.9) for all the measures, except for CSA for one observer (ICC = 0.701). Similarly, all inter-observer tests were also classified as excellent (ICC > 0.9), with the exception for CSA (ICC = 0.771). The Bland-Altman plots regarding rectus femoris analyses showed a bias of 0.005 cm for thickness (LoA = - 0.13 to 0.14 cm) and -0.97cm2 for CSA (LoA = - 4.11 to 2.17 cm^2). ROI echogenicity showed a narrower LoA (bias = 0.12; LoA = - 2.76 to 2.99 UA) than CSA echogenicity (bias = - 1.00 UA; LoA = - 4.43 to 2.42 UA).
Conclusion: Our results suggest a low degree of intra- and inter-observer error in the ultrasound evaluation of muscle and subcutaneous fat thickness, as well as a standard ROI muscle echogenicity. The use of ultrasound appears to be a reliable method to evaluate muscle quantity and quality in the upper leg of individuals with severe obesity.

PO1.089

Discovering HC-11074: an orally active non-peptide GLP-1R agonist for obesity

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Introduction: Obesity remains a global health crisis, contributing significantly to the burden of chronic diseases such as diabetes, cardiovascular disease, and certain cancers. Glucagon-like peptide-1 receptor (GLP-1R) agonists have proven effective in treating diabetes by enhancing glucose-dependent insulin secretion and improving energy balance. Peptide-based GLP-1R agonists have revolutionized diabetes and obesity therapy; however, their injectable nature limits widespread use. Despite extensive research, developing small-molecule GLP-1R activators with optimal pharmaceutical properties has been challenging.
Methods: Leveraging the crystal structure of GLP-1R and its endogenous ligand GLP-1, combined with insights into non-peptide agonists, we employed AI-driven rational design to discover HC-11074, a novel non-peptide GLP-1R agonist. HC-11074 acts as a partial agonist, demonstrating a preference for G protein activation over β-arrestin recruitment at GLP-1R. The potency of HC-11074 was assessed using a cell-based cAMP accumulation assay to evaluate its functional activity.
Results: HC-11074 demonstrated high potency with an EC50 of 5.3 nM in the cell-based cAMP accumulation assay. In preclinical efficacy studies, oral administration of HC-11074 resulted in significant glucose-lowering effects in humanized GLP-1R transgenic mice. In nonhuman primates, HC-11074 produced a dose-dependent weight loss of 6% and 14% at 0.3 mg/kg and 3 mg/kg, respectively. Additionally, food intake was reduced by 62.2% and 84.6% at these doses. These results highlight HC-11074's potential for obesity treatment, demonstrating a promising effect size in both animal models.
Conclusion: Our findings provide the molecular basis for HC-11074's activity as an oral GLP-1R agonist, supporting its development for obesity management. This work represents a significant advancement in the design of non-peptide GLP-1R modulators, offering therapeutic potential for obesity and related metabolic disorders.

PO1.090

Comparative Effects of Aerobic Exercise and Vibration Training on Metabolic Dysfunction and Thermogenic Fat Gene Expression in High-Fat Diet-Induced Obese Mice

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Introduction: Obesity is a global health challenge associated with a spectrum of metabolic disorders. Exercise is a proven strategy to enhance metabolic health; however, understanding the distinct effects of various exercise modalities is crucial for optimizing therapeutic interventions. This study compared the effects of aerobic exercise (AE) and vibration training (VT) on body composition, metabolic parameters, exercise performance, and thermogenic fat cell gene expression in high-fat diet (HFD)-induced obese mice.
Methods: Male C57BL/6 mice (6 weeks old) were fed either a standard chow diet or an HFD (60% energy from fat) for 6 weeks to induce obesity. Post-induction, HFD-fed mice were divided into sedentary, AE, or VT groups. AE was conducted via treadmill running, while VT utilized whole-body vibration. Body composition was analyzed using Minispec LF50 TD-NMR technology. Metabolic parameters included lipid profiles and glucose tolerance tests. Exercise performance was evaluated through grip strength, rotarod, and endurance tests. Histological examination of adipose and liver tissues was performed using H&E staining. RNA sequencing of brown adipose tissue (BAT) was conducted on the NovaSeq 6000 platform (Illumina, 150-bp paired-end), and differential gene expression with Gene Ontology (GO) enrichment analyses was carried out using the clusterProfiler package (FDR-adjusted P-values < 0.05).
Results: AE significantly decreased body weight and fat mass (absolute and relative), while maintaining lean mass, outperforming VT in fat reduction. AE also markedly improved lipid profiles, including reductions in total cholesterol (TCHO), low-density lipoprotein (LDL), triglycerides (TG), and improved glucose tolerance. AE mice exhibited superior motor

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function and endurance compared to sedentary and VT groups. AE significantly reduced adipocyte size and liver steatosis. Transcriptomic analysis of BAT revealed that AE regulated critical genes involved in inflammation, immune response, and extracellular matrix remodeling. Key genes implicated in obesity and metabolic regulation, such as LEP, MEST, IRS2, DPP4, and PPARGC1A, were significantly modulated by AE.
Conclusion: Aerobic exercise demonstrated robust benefits in reducing fat mass, ameliorating metabolic dysfunction, and improving exercise performance. Molecular insights highlight AE's role in modulating key metabolic and inflammatory pathways, providing a foundation for potential exercise-mimic therapeutic strategies targeting obesity and related metabolic disorders. Future studies will focus on the long-term impacts and underlying molecular mechanisms of AE.

PO1.091

Epigenetic regulation of adipose tissue during pregnancy in an obese and gestational diabetes melliuts context

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Introduction: Pregnancy is a stressful physiological state that requires dynamic metabolic adaptations which can trigger metabolic risk factors in the form of gestational diabetes mellitus (GDM). Moreover, these metabolic risks are exacerbated with obesity. Mechanistically, epigenetic modifications persist in a depot-specific manner for generations and these modifications are more intensive in obesity. Our aim is to evaluate the impact of epigenetic alterations associated with obesity during GDM which could predispose to overweight and obesity in offspring.
Methods: Pregnant women with different body mass index (BMI) and with or without GDM were included at 20-week's gestation. Pregnant women were stratified into four groups based on the presence of GDM and obesity. Subcutaneous (SAT), visceral (VAT), and total adipose tissue depth (ATD) were measured via ultrasounds at 20-, 28-, 32-, and 36-weeks of gestation. Furthermore, blood samples were collected between 24 and 28 weeks for genome-wide DNA methylation analysis with RRBS.
Results: Pregnant woman with obesity and GDM showed an increased pre-pregnancy BMI than normal weight pregnant women with GDM (p<0,001) (and those with normal weight pregnant women without GDM, p<0,05). In addition, in the second trimester of gestation, HbA1c levels were comparable between normal weight pregnant women with GDM and pregnant women with obesity and GDM, yet significantly elevated compared to non-GDM normal-weight pregnant women (p<0,05). Additionally, SAT and VAT depot increase notably in the obesity group with GDM (p<0,005). At this second trimester of gestation, those pregnant women with obesity and GDM displayed significant epigenetic alterations compared to pregnant women with normal weight and/without GDM showing by enrichment analysis that metabolic pathways, tight junction, phosphatidylinositol signaling system, leukocyte transendothelial migration, endocytosis and cell adhesion molecules were the most altered pathways in pregnant women with obesity and GDM.
Conclusions: At the second trimester of gestation adipose tissue is associated with insulin resistance and the development of GDM beyond pre-pregnancy BMI. Furthermore, the epigenetic changes observed in the regulation of adipose tissue could explain the transgenerational transfer from mother to fetus in accordance with maternal metabolism.

Conflict of interest: None Disclosed.

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PO1.092

In-utero exposure to fructose containing sugars increases cardiac enlargement risk in C57BL6 mice offspring, regardless of postnatal diet

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Introduction: It is well established that the in-utero environment can alter cardiometabolic risk later in life. Hypertrophic cardiomyopathy (HCM), characterised by abnormal thickening or enlargement of the heart muscle, is detectable in-utero and is the leading cause of sudden cardiac death. Dietary sugar consumption has been linked to HCM, and while glucose is essential for fetal development, fructose which is commonly consumed with glucose as sucrose has been linked to cardiometabolic disorders. Here, two studies were performed to understand the role of fructose containing sugars in-utero and throughout the lifespan.
Methods: To assess the role of fructose containing sugars in-utero, C57BL/6J mice were fed either standard chow, AIN93G, fructose (HF) or sucrose (HS) prior to and during pregnancy. On day E18 of pregnancy fetuses were harvest and total body weight was recorded before the placenta, liver and heart was isolated and underwent metabolomic analysis. In the second study, which aimed to determine how the cardiometabolic phenotype changes during adulthood under sucrose exposure, female C57BL/6J mice were fed HS or AIN93G and mated. Pups (n=10 litters/group) either continued their mother's diet or swapped to the other diet after birth. Body composition was determined, and hearts collected at 30-weeks for metabolomic analysis.
Results: Fetuses from HF mothers had reduced body weight relative to both control groups (p<0.01) accompanied by increased heart size compared to AIN93G (p<0.05). Additionally, placental metabolomic profiling revealed significantly elevated uric acid levels in fetuses exposed to HF. While there were no differences in body or heart weight, HS fetuses had alterations in key purine metabolites, AMP and guanosine. At 30-weeks, female mice fed HS in-utero and swapped to AIN93G postnatally were smaller and had less fat than all other groups. In contrast, females fed HS only postnatally were heavier and fatter than those fed only AIN93G. Males exposed to AIN93G in-utero and switched to HS postnatally were the heaviest and fattest among all groups. Lifelong HS-fed males were fatter than those switched from HS to AIN93G. Female pups exposed to HS only in-utero had greater heart size than all other groups (p<0.001). Lifelong HS-fed females also had larger hearts than AIN93G mice (p<0.05). Male AIN93G-fed mice had smaller hearts than lifelong HS (p<0.001) and HS-AIN93G mice (p<0.05). Lifelong HS males had larger hearts than mice fed HS only postnatally (p<0.01). Changes to metabolites such as serine, threonine, glycine and betaine suggest in-utero sucrose exposure interacts with key developmental and metabolic pathways, including Methionine-Homocysteine, folate, and one-carbon metabolism.
Conclusion: While functional phenotype is still being established, these findings suggest that exposure to fructose containing sugars in-utero, regardless of postnatal diet, increases risk of cardiac enlargement. This is evidenced by significant changes in key developmental and oxidative pathways.

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PO1.093

Sex-Specific Effects of Peptidyl Arginine Deiminase 4 Deficiency in the Cafeteria Diet-Induced Obesity-Associated Metabolic Complications

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Introduction: Obesity is a growing global health concern characterized by adipose tissue dysfunction and chronic low-grade inflammation, significantly impacting cardiovascular health. The sex-specific role of neutrophil extracellular traps (NETs), formed via the peptidyl-arginine deiminase type 4 (PAD4) enzyme, in the pathogenesis of obesity remains poorly understood. This study aimed to examine the metabolic effects of PAD4 deficiency in male and female mice in the long-term cafeteria diet (CAF)-induced model of obesity.
Methods: Female and male C57BL/6J (WT; n=11/12) and Pad4-deficient (PAD4(-/-); n=12/11) mice at the age of 6 months were divided into the CAF and control diet (CTRL) fed groups. After 21 weeks, mice underwent an oral glucose tolerance test, morphometric and body composition analysis, and thermographic measurements of body and brown adipose tissue (BAT). At week 22, blood was taken to determine the circulating concentrations of triacylglycerols (TAG), fasting insulin, HDL, LDL, and total cholesterol. The percentage of neutrophils forming NETs in blood was also quantified. Additionally, ecDNA concentration and DNase activity in the circulation were evaluated. The index of insulin sensitivity, body mass index, and a continuous metabolic syndrome score (a sum of Z-scores from fasting glycemia, fat mass, circulating concentrations of TAG, CHOL, and HDL (inverted)) were calculated.
Results: Compared to WT males consuming the CAF diet, PAD4(-/-) male mice consuming the CAF diet exhibited reduced body weight gain, improved lipid profiles, and higher energy expenditure, as indicated by higher BAT temperature. In contrast, PAD4(-/-)/CAF diet-fed female mice showed exacerbated obesity-related metabolic disturbances, impaired glucose metabolism, and lower BAT temperature than WT CAF females. Additionally, ecDNA concentration was higher in the PAD4(-/-)/CAF males compared to PAD4(-/-)/CTRL and WT/CAF males. No statistical differences were observed in ecDNA concentrations in females. In PAD4(-/-)/CAF males, lower DNase activity was observed compared to WT/CAF and PAD4(-/-)/CTRL males. The plasma DNase activity in female mice did not differ. NETs formation was lower in both PAD4(-/-) females and males compared to WT mice regardless of the type of diet consumed.
Conclusion: In conclusion, we demonstrate that Pad4 deficiency exerts a sex-specific effect on obesity development in mice. Males with Pad4 deficiency following long-term CAF diet consumption do not develop metabolic complications associated with obesity, whereas females with Pad4 deficiency experience a worsening of these complications. Our findings suggest that the inhibition of NET formation is linked to energy metabolism in a sex-dependent manner. Further research is essential to investigate safe and effective sex-specific therapies for obesity.

Conflict of Interest: None Disclosed.

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PO1.094

Postpartum adiposity is correlated with circulating proteins linked to cardiovascular disease in young South African women living with and without HIV

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Introduction: Postpartum adiposity is an important risk factor for future cardiovascular diseases (CVDs) among women of reproductive age, including those with HIV (WWH) (1, 2). However, little is known about the relationship between postpartum adiposity and targeted CVD-related protein markers in relatively young sub-Saharan African women. Therefore, we investigated associations between adiposity (anthropometry, body composition and fat distribution) and circulating proteins in the postpartum period, and modification by HIV infection.
Methods: We conducted a cross-sectional analysis of postpartum WWH (n=58) and without HIV (n=26) from May 2021 to June 2022 in Cape Town, South Africa. Serum proteins were assayed using the Olink Target 96 proteomics CVD-II and CVD-III panels. Body composition and regional fat distribution were measured using dual-energy X-ray absorptiometry. Linear regression models corrected for multiple testing using Benjamin-Hochberg were fit to examine whether each adiposity measure was correlated with relative protein concentration, and effect modification by HIV status. All models were adjusted for age, pre-pregnancy body mass index (BMI), HIV status, breastfeeding and postpartum time since delivery. Leptin was included as an additional covariate to identify leptin-independent correlations.
Results: Median age was 31 years (IQR 26-35), self-reported pre-pregnancy BMI was 31 kg/m2 (IQR 26-34) and postpartum time since delivery was 11 months (IQR 7-16). In multivariable models, weight (β=0.03, p=0.02), trunk fat mass (FM) kg (β=0.08, p=0.03) and android FM kg (β=0.43, p=0.02) were positively correlated with fatty acid binding protein 4 (FABP4). Android FM kg was also positively correlated with Interleukin-1 receptor antagonist (β=0.36, p=0.02) and Galectin-9 (β=0.19, p=0.02); and calculated visceral adiposity index with Fibroblast growth factor 21 (β=1.08, p=0.02). Waist-to-hip ratio was negatively correlated with Stem cell factor (β=-0.28, 95% CI: -0.37, -0.19, p<0.01). All correlations remained statistically significant after adjusting for leptin. Except for weaker correlations for weight (β=0.02, p=0.01), trunk FM

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kg (β=0.06, p=0.04), android FM kg (β=0.31, p=0.01) and FABP4 among WWH, no other protein-HIV interactions were observed.

Conclusion: Adiposity was associated with 5 CVD-linked proteins, and HIV infection weakened the associations with 1 of the 5 proteins. Longitudinal studies are required to establish the temporal direction of the relationships observed.

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Tab. 1.

Table. Statistically significant correlations of postpartum anthropometry, body composition and fat distribution with CVD-related systemic proteins

Model predictor	Model outcome (Protein)	Mean difference (95% CI)*	Adjusted p-value (fdr-q)
Anthropometry			
Weight (kg)	FABP4	0.03 (0.02, 0.04)	0.02
BMI (kg/m^2)	LEP	0.10 (0.05, 0.14)	0.03
Waist-hip ratio	SCF	-0.28 (-0.37, -0.19)	<0.01
Visceral adiposity index	FGF.21	1.08 (0.61, 1.56)	0.02
DXA-derived body composition and fat distribution			
Fat mass (kg)	LEP	0.04 (0.02, 0.06)	0.04
Body fat (%)	LEP	0.09 (0.06, 0.12)	<0.01
Trunk FM (kg)	FABP4	0.08 (0.04, 0.12)	0.03
Android FM (kg)	FABP4	0.43 (0.23, 0.63)	0.02
	IL.1ra	0.36 (0.19, 0.53)	0.02
	Gal.9	0.19 (0.10, 0.28)	0.02
	LEP	0.42 (0.21, 0.62)	0.03
Subcutaneous adipose tissue (cm^2)	LEP	0.01 (0.01, 0.01)	0.02

*Adjusted for age, pre-pregnancy BMI, HIV status, breastfeeding and postpartum time. Abbrev: BMI - body mass index, DXA - dual-energy X-ray absorptiometry, FM - fat mass, FABP4- Fatty acid binding protein 4, LEP - Leptin, SCF- Stem cell factor, FGF.21 - Fibroblast growth factor 21, IL.1ra- Interleukin-1 receptor antagonist, Gal.9 - Galectin-9.

PO1.095

Exposure to fructose-rich diet alters the offspring physiology promoting the development of cardiometabolic dysfunction later in life

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Introduction: Carbohydrates are the most prevalent macronutrient in the diet, playing a crucial role during pregnancy as glucose is the main substrate used for fetal growth and development.

Previous epidemiological studies have demonstrated the detrimental impacts of *in-utero* diet on the development of cardiovascular disease (Godfrey et al., 2017, Painter et al., 2006). One significant adverse development in the cardiovascular system is the development of hypertrophic cardiomyopathy (HCM). HCM is characterized by the thickening of the interventricular septum leading to diastolic dysfunction which can result in heart enlargement and in severe cases, sudden cardiac death.

Methods: Female C57BL6/J mice were exposed to a control-matched (AIN-93G) or high-fructose diet for five weeks before being mated. The pups were maintained on the same diet or had their diet switched after birth. At twelve weeks of age, measurements such as body composition through cardiac MRI, cardiac ultrasound through EchoVEVO, exercise tolerance, and blood pressure are taken.

Results: Results using twelve-week-old female pups exhibited a significant increase in body fat percentage only when exposed to a high-fructose diet *in-utero* and switched to a control-matched diet after birth compared to lifetime or post-natal fructose exposure (post-natal: p=0.0323, lifetime: p<0.001).

However, exercise tolerance is significantly reduced only when the female pups are exposed to post-natal fructose-rich diet compared to lifetime or *in-utero* fructose exposure (*in-utero*: p=0.023, lifetime: p=0.016). This finding is further corroborated by cardiac ultrasound results, which reveal a notably reduced diastolic function in post-natal fructose exposed-pups compared to those with *in-utero* fructose exposure only as measured through E/e' ratio.

Analysis of male pups indicated a significant elevation in diastolic blood pressure when the pups are exposed to fructose-rich diet at any period of their life compared to pups only exposed to lifetime AIN-93G (*in-utero*: p=0.005, lifetime: p<0.001).

Conclusion: Results indicated female pups exposed to *in-utero* fructose-rich diet and switched to AIN-93G exhibited a substantial increase in body fat. Furthermore, post-natal fructose-rich diet has dramatically diminished exercise tolerance. Male pups exhibit a significantly elevated diastolic blood pressure with fructose exposure at any period of life.

These findings indicate that both male and female pups are at risk of developing HCM through diastolic dysfunction in later life due to exposure to a fructose-rich diet.

PO1.096

The association of cardiorespiratory fitness with non-invasive markers of hepatic steatosis and fibrosis: a cross-sectional study of 39,009 UK adults

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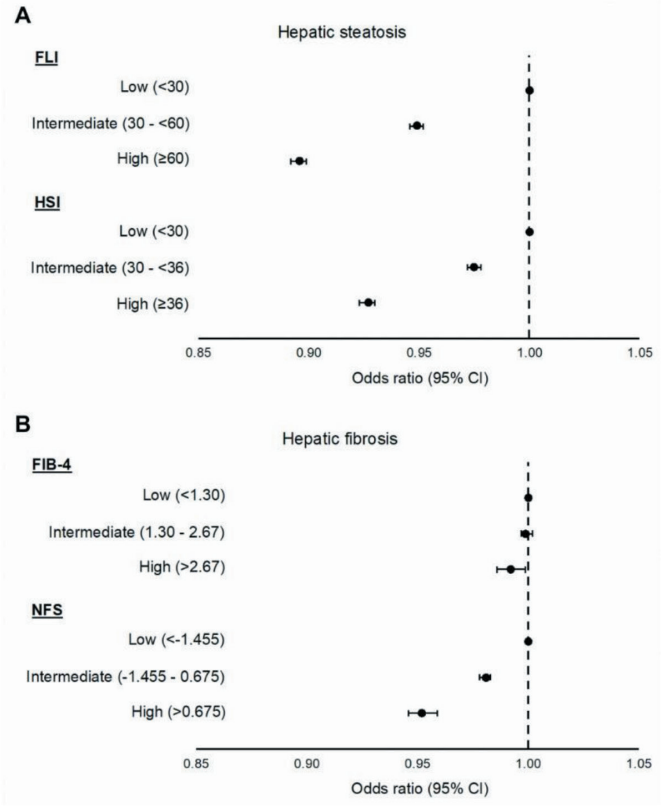
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Introduction: Exercise training remains a primary treatment option for individuals with steatotic liver disease (SLD). Cardiorespiratory fitness (CRF), improved through exercise training, has been identified as a powerful predictor of numerous health outcomes; however, its relationship with hepatic manifestations such as steatosis and fibrosis are not well characterised. This study examined the associations of CRF with non-invasive markers of hepatic steatosis and fibrosis in a large, population-based cohort.

Methods: This cross-sectional study included data for 39,009 UK adults (mean ± SD: age, 56.8 ± 10.1 years; BMI, 26.3 ± 4.1 kg/m^2; 69% male) collected from health assessments conducted between 2006 – 2024 by an independent healthcare charity. CRF was determined as peak oxygen uptake during a treadmill- or cycle ergometer-based maximal ramp test. Fasting blood samples were analysed for circulating concentrations of liver enzymes (alanine transaminase, aspartate transferase, gamma-glutamyl transpeptidase), glucose, triglyceride, albumin, and platelets. Non-invasive markers of hepatic steatosis (fatty liver index [FLI] and hepatic steatosis index [HSI]) and fibrosis (fibrosis-4 index [FIB-4] and NAFLD fibrosis score [NFS]) were subsequently calculated, and established thresholds for each index were used to categorise low, intermediate, and high risk of the associated clinical outcome. Multinomial logistic regression models, adjusted for demographic, cardiometabolic,

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and clinical variables, examined associations of CRF with the indices of hepatic steatosis and fibrosis.
Results: For the hepatic steatosis indices, each 1 ml/kg/min increase in cardiorespiratory fitness was associated with 2.5% (HSI; $P < 0.001$) to 5.1% (FLI; $P < 0.001$) lower odds of having an intermediate steatosis risk and 7.3% (HSI; $P < 0.001$) to 10.0% (FLI; $P < 0.001$) lower odds of having a high steatosis risk (Figure 1A). For the hepatic fibrosis indices, each 1 ml/kg/min increase in cardiorespiratory fitness was associated with 0.1% (FIB-4; $P = 0.604$) to 1.9% (NFS; $P < 0.001$) lower odds of having an intermediate fibrosis risk and 0.8% (FIB-4; $P = 0.030$) to 5.4% (NFS; $P < 0.001$) lower odds of having a high fibrosis risk (Figure 1B). Interaction analyses revealed that these relationships were stronger in those who were younger, female, and of a lower socioeconomic status. Additionally, the inverse association between cardiorespiratory fitness and FLI was weaker in individuals with worse glycaemic control and a higher BMI category.
Conclusion: In a large, population-based cohort, higher CRF was associated with a lower risk of hepatic steatosis and advanced fibrosis, determined using non-invasive indices. Furthermore, these relationships were most consistently modified by age, sex, and socioeconomic status. These findings highlight CRF as a prominent predictor of hepatic steatosis/fibrosis risk and underscore the importance of improving CRF in individuals with SLD.



Forest plot of the associations of cardiorespiratory fitness (CRF) with non-invasive markers of hepatic steatosis (A; fatty liver index [FLI], hepatic steatosis index [HSI]) and fibrosis (B; fibrosis-4 index [FIB-4], NAFLD fibrosis score [NFS]), categorised using established risk thresholds. Data are presented as odds ratios and 95% confidence intervals (CI) representing the odds of being at an intermediate or high risk compared to the low-risk group (reference) per 1 ml/kg/min increase in CRF. Data were analysed using multinomial logistic regression models adjusted for age, sex, index of multiple deprivation, BMI, triglyceride, glycaemic status, hypertension, CRF assessment mode, assessment year and UK region of assessment centre.

Fig. 1.

PO1.097

BACH1 promotes endoplasmic reticulum stress to aggravate lipid deposition in metabolic dysfunction-associated steatotic liver disease

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Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD) has become the most common chronic liver disease in the world. Excessive lipid deposition drives the progress of MASLD, and endoplasmic reticulum stress (ERS) can aggravate lipid deposition. BTB and CNC homology 1 (BACH1) is a stress-related transcription factor, we aimed to explore the role of BACH1 on ERS and lipid deposition in MASLD.
Methods: The BACH1 expression was analyzed in the livers of MASLD patients, MASLD rats and primary hepatocytes. Liver specimens confirmed pathologically as MASLD were collected at the Third Affiliated Hospital of Sun Yat-sen University. Male 7-week-old Sprague Dawley rats received a 12-week high-fat and high-cholesterol diet (HFHCD) to establish a MASLD animal model. Collagenase perfusion method was used to isolate rat primary hepatocytes. H&E staining and Oil Red O staining of liver tissue sections were used to detect liver lesions. Enzyme linked immunosorbent assay was used to detect the content of alanine aminotransferase (ALT), aspartate aminotransferase (AST) and triglyceride (TG). BACH1-plasmid or small interfering RNA targeting BACH1 was used to upregulate or downregulate BACH1 expression in cells. Real-time quantitative polymerase chain reaction, Western blot, and BODIPY staining experiment were also performed.
Results: The BACH1 expression in the livers of MASLD patients was higher than that in the control group. After HFHCD intervention for 12 weeks, the levels of serum ALT, AST and liver TG in rats were significantly higher than those in the control group, and the liver of rats in the HFHCD group showed obvious hepatocyte steatosis and fat vacuoles. Compared with the control group, the BACH1 expression in the liver and primary hepatocytes of MASLD rats was significantly increased. Importantly, up-regulation of BACH1 promoted ERS, manifested by increased expression of immunoglobulin heavy chain binding protein (BIP), C/EBP-homologous protein (CHOP), inositol-requiring enzyme 1 alpha (IRE1α), PKR-like endoplasmic reticulum kinase (PERK) and activating transcription factor 6 (ATF6). Down-regulation of BACH1 resulted in decreased expression of these proteins. In addition, BACH1 promoted the expression of sterol regulatory element binding protein 1 (SREBP1), acetyl-CoA-carboxylase 1 (ACC1) and fatty acid synthase (FASN), while down-regulation of BACH1 inhibited their expression. BACH1 also aggravated lipid deposition and increased TG content, while down-regulation of BACH1 improved lipid deposition and decreased TG content.
Conclusion: The BACH1 expression increased during the progression of MASLD. Targeting BACH1 can reduce ERS and improve lipid deposition.

Conflict of Interest: All authors declare no conflict of interest.

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PO1.098

The frequency of insulin resistance in women with polycystic ovary syndrome (PCOS) depends on the diagnostic methodology

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Introduction: Insulin resistance is an important element in hormonal disorders development, characteristic of PCOS while improving insulin sensitivity is one of the therapeutic goals. In daily clinical practice insulin resistance is most often diagnosed based on HOMA-IR values. In recent years, new markers for insulin resistance have been proposed, such as SHBG, TyG indexes, TyG-BMI index, and TyG-WC index. All these markers have been used in clinical studies, but none have been implemented in clinical practice. Therefore, our current study aimed to assess the prevalence of insulin resistance in the population of women with PCOS based on the established in literature cut-off points of HOMA-IR (2.1), TyG (8.31), TyG-BMI (233.44) and TyG-WC (735) indexes and SHBG levels (41.5 mmol/L) estimated for Caucasian, young women with PCOS.
Methods: Medical records of 611 subsequent Caucasian women diagnosed with PCOS were analyzed. The following data were retrieved from the medical records: age, body weight, height, waist circumference, as well as glucose, insulin, triglyceride, and SHBG levels. The HOMA-IR, TyG, TyG-BMI, and TyG-WC indexes were calculated.
Results: Insulin resistance in women with PCOS was most frequently detected using the cut-off point for SHBG level as a diagnostic marker (50.6%), followed by the TyG index (39.6%), HOMA-IR (33.7%) and TyG-WC index (33.2%), and the least frequently using the TyG-BMI index (32.7%). Considering the sum of the 5 analyzed methods of determining insulin resistance, 200 (32.7%) of the subjects did not have insulin resistance, while 137 (22.4%) had one positive indicator, 60 (9.8%) had two, 48 (7.9%) had three, 71 (11.6%) had four, and 95 (15.6%) had all five. The increasing number of positive indicators was associated with the rising frequency of abnormal androgen concentrations and clinical features of hyperandrogenism, as well as lipid disturbances.
Conclusion: Our study shows that the frequency of insulin resistance in women with PCOS depends on the method of its evaluation. SHBG level seems to be a better marker for determining insulin resistance in this group. In addition, our study suggested that insulin resistance in women with PCOS can only be excluded based on the sum of all mentioned markers.

PO1.099

Can we improve the diagnosis of obesity in women with polycystic ovary syndrome (PCOS) with other than BMI methods?

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Introduction: Obesity, especially visceral obesity, is the cause of PCOS development in genetically predisposed women. Effective treatment of obesity is one of the therapeutic goals for restoring ovulation and increasing the chance of having children. However, obesity not in all women with PCOS can be diagnosed based on BMI. In many diseases, much stronger associations with anthropometric parameters considered markers of visceral obesity, including waist circumference (WC), waist-to-hip ratio (WHR), waist-to-height ratio (WHtR), and waist-to-hip-to-height ratio (WHHR) than BMI have been demonstrated. Therefore, our current study aimed to assess the prevalence of visceral obesity in the population of women with PCOS based on the cut-off points of WC (80 cm), WHR (0.85), WHtR (0.5), and WHHR (0.52).
Methods: Medical records of 600 subsequent Caucasian women diagnosed with PCOS were analyzed. The following data were retrieved from medical records: age, body weight, height, waist circumference, as well as glucose, insulin, triglyceride, and SHBG levels. The values of BMI, WHR, WHtR, WHHR, HOMA-IR, and TyG index were calculated.
Results: Based on BMI, obesity was diagnosed in 22.5% of study women. Visceral obesity was diagnosed in 51.5% based on WC, 25.8% on WHR, 45.3% on WHtR, and 25.0% on WHHR. Assuming BMI > 30 kg/m2 as the gold diagnostics standard for obesity, we can compare the agreement with other diagnostic methods. For: • waist circumference, the agreement was 426 (71%); false positives (N = 174) and false negatives (N = 0); Holley & Guilford's G = 0.42; • WHR, the agreement was 466 (77.7%); false positives (N = 77) and false negatives (N = 57); Holley & Guilford's G = 0.55; • WHtR, the agreement is 461 (76.8%); false positives (N = 138) and false negatives (N = 1); Holley & Guilford's G = 0.54; • WHHR, the agreement was 469 (78.2%); false positives (N = 73) and false negatives (N = 58); Holley & Guilford's G = 0.56.
Conclusion: Our study shows that the use of waist circumference and WHtR index for diagnosing obesity causes its diagnosis twice as often as when it is diagnosed based on the BMI cut-off.

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PO1.100

The cut-off value for triglyceride-glucose- waist circumference index (TyG-WC) discriminating the insulin resistance based on the SHBG level and HOMA-IR values in women with polycystic ovary syndrome

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Introduction: Based on HOMA-IR we recently estimated the empirical optimal cutoff values (for insulin resistance) for SHBG levels on ≤ 41.5 nmol/L in women with PCOS. The other proposed markers of insulin resistance are TyG, TyG-BMI, and TyG-WC indexes. The cut-off point for insulin resistance was TyG index > 8.55 estimated for the general population and > 8.51 estimated for women with PCOS. The second marker of insulin resistance was the TyG-BMI index > 238 estimated for the general population and > 192 estimated for women with PCOS. The third marker of insulin resistance was the TyG-WC index > 822 estimated for the general population and has not yet been estimated for women with PCOS. Therefore, our current study aimed to estimate the cut-off values for SHBG level discriminating the insulin resistance based on the values of TyG, TyG-BMI, and TyG-WC indexes in women with PCOS.
Methods: Medical records of 311 subsequent Caucasian women diagnosed with PCOS were analyzed. Due to the exclusion criteria ultimately, data from 264 (84.9%) women were included. The following data were obtained from the medical records: age, body weight, height, waist circumference, as well as glucose, insulin triglyceride, and SHBG levels. The TyG, TyG-BMI, and TyG-WC indexes were calculated. The cut-off SHBG level was calculated using receiver-operating characteristics (ROC).
Results: Empirical optimal cut-off for SHBG level corresponding to TyG values ≥ 8.55 was < 40.24 nmol/L (area under the curve [AUC] 0,74, accuracy 0.63, sensitivity 68.6%, specificity 62.0%, positive predictive value [PPV] 30.1%, negative predictive value [NPV] 89.2%) and to TyG values ≥ 8.126 was > 45.22 mmol/L (AUC 0,67, accuracy 0.64, sensitivity 63.3%, specificity 64.1%, PPV 68.9%, NPV 58.1%), to TyG-BMI index value > 237.77 was > 40.12 nmol/L (AUC 0.85, accuracy 0.75, sensitivity 82.0%, specificity 72.0%, PPV 55.2%, NPV 90.5%), to TyG-BMI values > 191.53 was > 50.81 nmol/L (AUC 0,83, accuracy 0.75, sensitivity 79.9%, specificity 68.7%, PPV 76.8%, NPV 72.5%), to TyG-WC values > 822.34 was > 39.05 nmol/L (AUC 0,83, accuracy 0.70, sensitivity 78.4%, specificity 68.1%, PPV 37.0%, NPV 92.9%).
Conclusion: Our study confirms the usefulness of using SHBG level as a marker of insulin resistance in Caucasian women with PCOS. The SHBG level below 40 nmol/L allows for the detection of insulin resistance with high sensitivity and specificity, which should prompt close monitoring of liver function and the occurrence of prediabetes.

PO1.101

Mapping alterations in the local synchrony of the cerebral cortex in Prader Willi syndrome

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Introduction: Prader Willi syndrome (PWS) is a rare genetic disorder caused by the loss of expression of paternally imprinted genes on chromosome 15 q11-13. Type-A receptor for gamma-aminobutyric acid (GABA) is encoded in this subset of genes. Among many multisystemic manifestations, they often exhibit behavioral difficulties characterized by deficient impulse regulation and obsessive-compulsive features aligned with molecular and neurophysiological findings suggesting dysfunction in the inhibitory GABA interneuron system. In the cerebral cortex, this dysfunction is expressed as desynchronization of local neural activity.
Methods: Twenty-two adult patients with PWS, and twenty-two age and sex-matched healthy controls were selected to participate. Functional connectivity MRI was used to examine potential alterations in the local synchrony of the cerebral cortex. Whole-brain functional connectivity maps were generated using iso-distance average correlation (IDAC) measures. Behavioral and emotional assessment was done through questionnaires.
Results: Patients with PWS showed reduced local connectivity (weaker synchrony) in frontal areas, including the orbitofrontal cortex, ventral medial and lateral frontal regions, the anterior cingulate cortex, and sensory areas. The presence of obsessive-compulsive symptoms was significantly associated with the degree of functional structure alteration in part of the orbitofrontal and sensory cortices. In addition, abnormally heightened functional connectivity (stronger synchrony) was identified in the posterior cingulate cortex and the bilateral angular gyri, core components of the default mode network, with distance-dependent effects.
Conclusion: The findings of cortical synchrony alterations indicate a degree of overlap with the anatomy of the alterations previously observed in primary obsessive-compulsive disorder, while also suggesting the implication of GABAergic dysfunction in the pathophysiology of the disorder. Abnormal stronger synchrony in key components of the default mode network also highlight the great complexity of cortical dysfunction in PWS. These observations may support the rational development of more specific therapeutic strategies in the treatment of behavioral disinhibition characteristic of PWS.

Conflict of Interest: The authors have no conflicts of interest.

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PO1.102

Spotlight on the Effects of Incretin-Based Therapies on Metabolic and Muscular Homeostasis: A Comparative Study of GLP-1, GIPR, and GCGR Multi-Target Agonists

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Background: The global rise in metabolic diseases like type 2 diabetes and obesity burdens healthcare systems. Advances in metabolic regulation have led to incretin-based therapies improving glycemic control and weight loss. Recognized as the Breakthrough of the Year by Science, GLP-1 agonists have paved the way for dual and triple target agonists, which enhance outcomes by combining GLP-1 with GIP or GCGR agonism, improving metabolism, insulin sensitivity, and reducing side effects. This study evaluates the effects of GLP-1 agonist semaglutide, dual-target agonist tirzepatide, and triple-target agonist retatrutide on weight loss, body composition, and muscle function in a humanized mouse model.
Methods: Male h-GLP1-r-C57BL6/J mice (28 weeks old, ~55g) were divided into four groups and treated subcutaneously with vehicle, semaglutide, tirzepatide, or retatrutide daily for 38 days. Daily recordings were made of body weight and food intake. Assessments were conducted for body composition, energy expenditure, muscle contractility, muscular function (grip strength tests, suspension experiments, and treadmill assessments), and bone density. On day 39, the mice were euthanized for tissue and blood sample collection.
Results: As of day 23 of the ongoing study, the vehicle group saw a 4.90% weight increase, while semaglutide, tirzepatide, and retatrutide treatment groups had weight reductions of 17.04%, 23.07%, and 37.58%, respectively. Food intake dropped significantly in all treatment groups, with retatrutide-treated mice eating the least, indicating a strong anorectic effect.
In terms of body composition, all three treatments reduced fat mass compared to the vehicle group: retatrutide by 71%, tirzepatide by 46%, and semaglutide by 37%. Muscle loss was modest: 8% for both semaglutide and tirzepatide, and 12% for retatrutide. Thus, while retatrutide leads to the most significant fat reduction, it also shows slightly higher muscle loss, which should be considered when evaluating its overall benefits and potential side effects.
Glucose and insulin levels were similar across the three treatment groups. Further analyses on energy expenditure, muscle function, behavior, tissue/fat weight, liver/renal function, and histopathology are ongoing and will be included in the final poster.
Conclusion: Our study shows that the GLP-1 agonist semaglutide, dual-target agonist tirzepatide, and triple-target agonist retatrutide significantly reduce body weight and fat mass in a humanized diet-induced obesity (DIO) mouse model. Retatrutide exhibited the most pronounced effects but with slightly higher muscle loss. Despite differences in weight and fat loss, glucose and insulin levels were similar across all treatment groups, indicating effective glycemic control. Further analyses on energy expenditure, muscle function, behavior, tissue/fat weight, liver/renal function, and histopathology will provide more insights in the final results.

PO1.103

Circulating cell-free DNA in obesity

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Introduction: Metabolic disorders are an escalating global health concern, highlighting the need for improved diagnostic tools. One promising advancement is cell-free DNA (cfDNA), which consists of small DNA fragments released from apoptotic and necrotic cells that retain tissue-specific epigenetic signatures [1] and therefore offer insights into tissue-specific states. This study aims to characterize cfDNA circulation in the progression of obesity and to identify cfDNA-derived signatures linked to severe metabolic outcomes.
Methods: EDTA-blood samples from 163 patients in the Leipzig Obesity BioBank (LOBB) and 95 patients in the Obese Taste Buds (OTB) cohorts were used to extract cfDNA with the Apostle MiniMax High Efficiency Cell-Free DNA Isolation kit (Beckmann Coulter). Finally, cfDNA fragments were quality-controlled and quantified using the High Sensitivity DNA Kit for 2100 Bioanalyzer Systems (Agilent Technologies). Bulk RNA sequencing in subcutaneous and omental visceral adipose tissue, as well as subsequent data processing and analysis, were performed as previously described [2]. Capture enzymatic-methylation sequencing data of pooled LOBB cfDNA samples were used for the cfDNA tissue-of-origin deconvolution based on a human cell DNA methylation atlas [3]. Statistical analyses were performed using the R software (version 4.4.2).
Results: Blood cfDNA load positively correlated with body weight indicators (e.g., BMI), glucose homeostasis indices (e.g., HOMA-IR), and inflammation markers (e.g., IL-6). In addition, bulk RNA sequencing in omental visceral adipose tissue (OVAT) from LOBB participants and subsequent weighted gene co-expression network analysis (WGCNA) identified a proliferation-, differentiation- and apoptosis-related transcriptional gene cluster associated with circulating cfDNA levels. Finally, tissue-specific methylation pattern deconvolution determined the contribution of different tissues to pooled LOBB cfDNA samples, thus identifying adipocytes as important contributors to blood cfDNA in patients with obesity, together with pancreas- and liver-derived cells.
Conclusion: Our findings underscore the potential of cfDNA as a diagnostic biomarker for metabolic disorders. Furthermore, we contributed to showing how cfDNA can be utilized to investigate epigenetic tissue-specific changes associated with obesity.

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PO1.104

Adaptations of human brown adipose tissue to caloric restriction: Rationale, design and methodology of the BATON study

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Introduction: Obesity is a risk factor for the development of multiple diseases. A 5-15% reduction in body weight significantly improves the prognosis of patients with obestiy. However, the weight lost through dietary interventions is quickly regained by most patients. Indeed, at least 50% of patients return to their initial weight within 5 years. Adaptive thermogenesis (also known as metabolic adaptation) is the reduction in energy expenditure that exceeds the change attributable to changes in body weight and composition. It is thought that adaptive thermogenesis is one of the physiological mechanisms that facilitate this weight loss recovery. The downregulation of the remarkable thermogenic activity exhibited by brown adipose tissue (BAT) might be one of the mechanisms mediating adaptive thermogenesis. If that was the case, targeting BAT activation might be an effective way of counteracting adaptive thermogenesis. However, we still lack an understanding of how human BAT is adapted to caloric restriction on BAT. Consequently, the aim of this study is to characterize the adaptations experienced by human BAT in response to caloric restriction.
Methods: The BATON study is a randomized controlled trial in which 20 female and male adults (18-25 years; BMI: 28-35kg/m2) will be allocated into a control group, following a weight-maintenance diet for 12-16 weeks, or a calorie restriction group, following a personalized dietary intervention designed to produce 8-10% weight loss within 12-16 weeks. Because seasonality has a great influence on BAT adaptation and the inclusion of participants will be done in couples, we will use block randomization. Efforts will be also carried out to balance the number of female and male participants in both groups. Before and after the dietary interventions, BAT volume and activity will be measured by 18F-Fluorodeoxyglucose positron emission tomography and computerized tomography, during a 3-hour cold exposition, using dynamic and static acquisition mode. In addition, BAT biopsies will be collected to investigate the changes in BAT anatomical, molecular and bioenergetic characteristics. Moreover, blood samples will be collected before and after the cold exposure to explore potential molecules secreted by the BAT. Other outcomes include composition, resting energy expenditure, the physiological response to a test meal, appetite-related sensations and ad libitum energy intake, and cardiometabolic factors.
Results: This study seeks to clarify how calorie restriction affects BAT, providing crucial information to understand its role in the regulation of body weight in humans. Animal studies suggest that caloric restriction can affect the amount and thermogenic activity of BAT in an age-dependent fashion. Preclinical evidence suggests that BAT volume and activity will be reduced in response to caloric restriction in young adults. If that was confirmed, BAT inhibition would be part of adaptive thermogenesis, which might imply that it could be an attractive therapeutic target.
Conclusions: This study will explore, for the first time in humans, how BAT adapts to caloric restriction.

PO1.105

Study of the interaction between probiotics, lipid metabolism, and microbiota in postprandial states

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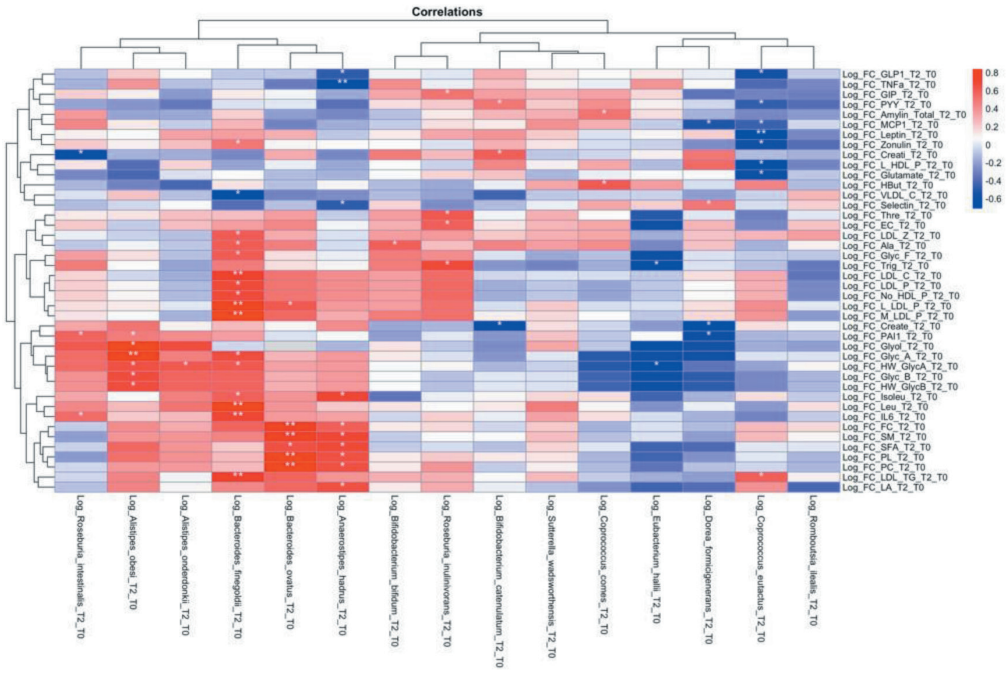
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Introduction: Gut microbiota plays a key role in metabolic regulation and diseases such as obesity and insulin resistance. This study evaluates the effects of Lactobacillus supplementation on serum metabolites, inflammation, and gut microbiota composition during postprandial states following fat overload.
Methods: Fifty participants (28 with obesity, 22 without obesity) were randomized to receive either *Lactobacillus* (probiotic group) or placebo for 2 months respectively. Oral fat overload tests were conducted pre- (T0) and post-treatment (T2). Fasting and postprandial serum samples were analyzed via nuclear magnetic resonance (NMR) for metabolites related to inflammation, lipid metabolism, and gut microbiota activity. Microbiota composition was assessed through DNA sequencing for relative abundance and alpha-diversity.
Results: Probiotic supplementation reduced inflammatory markers (GlycA, GlycB, GlycF) and insulin levels. Fat overload increased hydroxybutyrate (microbiota-derived) and reduced lactate levels, with hydroxybutyrate increases more pronounced in the probiotic group at T2. Probiotic treatment altered microbiota composition, increasing Bacteroidota and reducing Proteobacteria abundance. Notably, *Bacteroides finegoldii*, associated with elevated LDL and IL-6, was reduced in the probiotic group, while *Coprococcus eutactus*, linked to lower leptin and zonulin levels, increased. Alpha-diversity decreased in the probiotic group but increased with placebo.
Conclusions: *Lactobacillus* supplementation significantly modulates lipid metabolism, inflammation, and microbiota composition, particularly during postprandial states. These findings suggest a potential therapeutic role for probiotics in managing metabolic health.

Conflict of Interest: None Disclosed

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Correlation Between Gut Microbiota and Lipid Metabolism-Related Metabolites. Bacteroides finegoldii, associated with elevated LDL and IL-6, was reduced in the probiotic group, while Coprococcus eutactus, linked to lower leptin and zonulin levels, increased.

Fig .1. Gut Microbiota and Lipid Metabolite Correlations.

PO1.106

Targeting MC4R with Setmelanotide Reduces Body Weight and Improves Metabolic Parameters in a Diet-Induced Obesity Mouse Model

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Background: The global obesity epidemic has increased risks of diabetes, cardiovascular diseases, cancers, and impaired health, reducing quality of life. Since 1990, adult obesity has doubled and adolescent rates have quadrupled. By 2022, 1 in 8 people worldwide were obese. Despite medical advancements, long-term effectiveness, safety, and weight regain remain challenges. Targeting MC4R, which regulates appetite and energy in the brain, is a promising obesity treatment. Setmelanotide, an MC4R agonist, is being studied for its efficacy in reducing weight and improving metabolic parameters in a diet-induced obesity mouse model with various dosages and routes.
Methods: Male 5-week-old C57BL/6J mice were fed a high-fat diet for 24 weeks to induce obesity. Afterward, they received either a vehicle or Setmelanotide at 0.04 mg/kg SC every three days, or continuously at 1.6, 0.4, or 0.1 mg/kg/day via a subcutaneous osmotic pump for 14 days. Primary endpoints included body weight, food intake, and metabolic biomarkers.
Results: Setmelanotide treatment significantly reduced body weight in mice. A 10 mg/kg SC daily dose led to a 14.3% weight decrease. The osmotic pump resulted in weight reductions of 12.3%, 10.8%, and 5.8% at 1.6, 0.4, and 0.1 mg/kg/day, respectively. Cumulative food intake decreased with the osmotic pump at 1.6 and 0.1 mg/kg/day, but not with the 10 mg/kg SC dose. Plasma biochemistry showed reductions in AST, ALT, HDL, LDL, and TC at 1.6 mg/kg/day with the pump, while the 10 mg/kg SC dose only reduced ALT and LDL.
Conclusion: This study shows that targeting MC4R with Setmelanotide significantly reduces body weight and improves metabolic parameters in a diet-induced obesity mouse model. Setmelanotide, especially via subcutaneous infusion with an osmotic pump, effectively decreased body weight and food intake, and improved metabolic biomarkers. These findings highlight MC4R activation as a promising obesity treatment strategy.

PO1.107

Targeting the CB1 Receptor for Enhanced Obesity Management: Efficacy Comparison of Rimonabant and GLP-1 Receptor Agonist in Diet-Induced Obesity

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Background: Obesity is a global health crisis linked to serious diseases and reduced quality of life. Since 1990, obesity rates have surged, with adult obesity doubling and adolescent obesity quadrupling. While GLP-1 receptor agonists show promise, they raise concerns about safety, accessibility, and weight regain. Given these issues, the CB1 receptor is a promising target due to its role in energy balance, appetite, and metabolism. This study compares Rimonabant's efficacy with GLP-1 receptor agonists on weight loss, body composition, and metabolism in a diet-induced obesity mouse model.
Methods: Male 5-week-old C57BL/6J mice were fed a high-fat diet for 12 weeks to induce obesity. They were then given either a vehicle or test articles: Rimonabant (10 mg/kg, PO, QD for 42 days) or Semaglutide (0.04 mg/kg, SC, Q3D). Primary endpoints included body weight, body composition, and metabolic biomarkers.
Results: Rimonabant reduced body weight by 36.8%, compared to 18.9% with Semaglutide, and induced greater body fat loss. Both treatments similarly affected lean body mass. Rimonabant also significantly decreased food intake, fasting blood glucose, liver triglycerides, adipose tissue weight, and NAFLD activity.
Conclusion: This study shows Rimonabant's significant potential as an obesity treatment. It outperformed Semaglutide in reducing body weight and fat, with both treatments causing similar lean body mass loss.

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Rimonabant also improved metabolic parameters, such as food intake, fasting blood glucose, liver triglycerides, adipose tissue weight, and NAFLD activity. Despite past concerns, targeting the CB1 receptor is promising. Future research should aim to develop CB1 antagonists with better safety profiles to enhance obesity treatment.

PO1.108

A novel and unexpected key role for claudin-1 in brown adipose tissue thermogenesis and energy metabolism

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Introduction: It is well known that brown adipose tissue (BAT) consumes energy via thermogenesis and has an important endocrine function. For this reason, BAT is one of the target tissues to fight against obesity and metabolic diseases. There is no data available regarding the non-canonical role of tight junctions' molecules in energy metabolism yet, specifically in adipose tissue. Here, we report the discovery on an unexpected link between claudin-1 (Cldn1), a tight junction's contributor, and BAT thermogenesis.
Methods: Immortalized adipocyte cells from mice were used to study the regulation of *Cldn1* expression in response to different *in vitro* thermogenic stimuli. In addition, the effect of silencing *Cldn1* on thermogenic activation was also tested in brown adipocytes by bulk-RNAseq analysis. C57BL/6 mice model were used in *in vivo* studies to investigate *Cldn1* expression in BAT after acute cold-mediated thermogenic activation. Moreover, *Cldn1* was specifically silenced in BAT using AAV and mice were exposed to 24 hours of cold stimuli.
Results: *Cldn1* expression was dramatically induced by acute cold exposure in brown fat in mice (mean 6.8 vs. 1.0; $p < 0.001$), and by cAMP-mediated thermogenic activation in immortalized adipocytes (mean 4.7 vs. 0.9; $p < 0.001$). The reduced expression of *Cldn1 in vitro* (75% reduction) caused a downregulation of key genes (*Atp5a1*, *Atp6ap2*, *Coa5*, *Nampt*) involved in ATP synthesis, mitochondrial and ER function. Moreover, this reduction was also accompanied by an upregulation of genes related to actin filaments and the adrenergic receptor. Finally, silencing of *Cldn1* in BAT (65% reduction) lead to a 30% thermogenic induction of *Cldn1* compared to the control group. In addition, this mice model presents increased weight gain, in the absence of altered food intake.
Conclusion: These data strongly suggests that Cldn1 plays an important role in BAT thermogenesis and energy homeostasis. Further studies would be needed to determine whether this protein could be a new target to treat obesity modulating energy expenditure.

Conflict of Interest: None Disclosed

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PO1.109

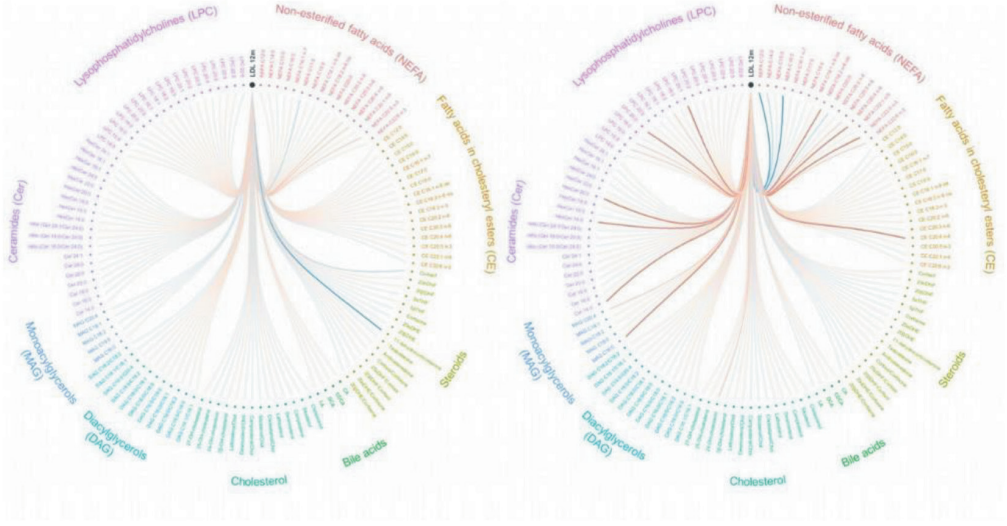
Exploring Plasma Lipidomic Changes and LDL Cholesterol Modulation in Gastric Bypass vs. Sleeve Gastrectomy

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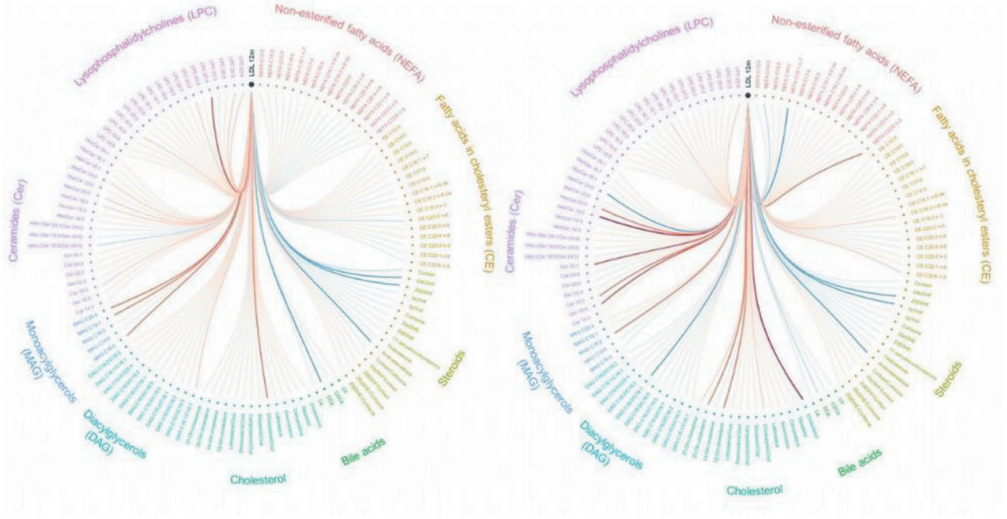
Introduction: Gastric bypass (RYGB) has shown greater efficacy than sleeve gastrectomy (SG) in lowering LDL cholesterol, but the mechanisms underlying these differences remain unclear. This study analyzed plasma lipidome changes after bariatric surgery and their association with LDL cholesterol reduction.
Methods: This analysis is part of the BASALTO trial (NCT03975478), a phase 3, single-center, randomized controlled trial comparing LDL cholesterol remission between gastric bypass (RYGB) and sleeve gastrectomy (SG) at 12 months. Plasma lipidomic profiles were analyzed using liquid chromatography-mass spectrometry at baseline, 3, and 12 months. Lipid families included non-esterified fatty acids, monoacylglycerols (MAGs), diacylglycerols (DAGs), cholesteryl esters (CEs), lysophosphatidylcholines (LPCs), ceramides (Cer), hexosylceramides (HexCer), steroids, and bile acids. Multiple linear regression models were used to evaluate associations between lipidomic changes at 3 and 12 months and LDL cholesterol at 12 months, with false discovery rate (FDR) correction applied for multiple comparisons.
Results: Thirty patients (15 per group; mean age 51.0±7.9 years, BMI 43.2±3.8 kg/m^2) were included. Gastric bypass (RYGB) significantly reduced LDL cholesterol (-0.88±0.50 mmol/L, p<0.001), while sleeve gastrectomy (SG) showed variable responses (-0.03±0.84 mmol/L, p=0.435). Both techniques induced common lipidomic changes, including reductions in CEs and DAGs at 12 months and a biphasic pattern in LPCs, with decreases at 3 months and increases at 12 months. Ceramide changes were heterogeneous: at 3 months, some increased with both techniques, while others decreased only with RYGB. At 12 months, these differences were attenuated. Cholesterol synthesis markers decreased similarly with both techniques, while absorption-related metabolites, including campesterol, sitosterol, and cholestanol, increased with SG but decreased or remained stable with RYGB.
Associations between lipidomic changes at 12 months and LDL cholesterol at 12 months were observed following RYGB. Positive associations were found with non-esterified fatty acids (C22:5n-3 and C18:2n-6cis), ceramides (Cer-14:0 and HexCer-14:0), LPC (20:0 and 20:1), and cholesteryl esters (C20:4n-6), although none remained significant after FDR correction. After SG, associations between lipidomic changes at 3 months and LDL cholesterol at 12 months were observed, including monoacylglycerols (MAG 16:0, 20:4, 18:1;pFDR<0.05). At 12 months, positive associations were found between lipidomic changes and LDL cholesterol, with cholestanol (pFDR=0.039) and HexCer-18:0 (pFDR=0.031) showing significant associations, while Cer-16:0 and Cer-24:1 had borderline associations (pFDR=0.060).
Conclusions: The homogeneous reduction in LDL cholesterol observed after RYGB does not appear to be explained by changes in the explored lipid species. In contrast, the variable response seen after SG may be linked to cholesterol absorption and ceramide metabolism.

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The figure shows associations between lipidomic changes and LDL cholesterol at 12 months. The left panel corresponds to changes in the lipidome at 3 months, and the right panel to changes at 12 months. Blue lines indicate negative associations, while red lines represent positive associations. Line intensity reflects the level of statistical significance.

Fig. 1. Association between the change in LDL cholesterol concentration at 12 months and lipidomic changes following gastric bypass.



The figure shows associations between lipidomic changes and LDL cholesterol at 12 months. The left panel corresponds to changes in the lipidome at 3 months, and the right panel to changes at 12 months. Blue lines indicate negative associations, while red lines represent positive associations. Line intensity reflects the level of statistical significance.

Fig. 2. Association between the change in LDL cholesterol concentration at 12 months and lipidomic changes following sleeve gastrectomy.

PO1.110

Sex-specific effects of TGFβ3 on mitochondrial function and lipid metabolism in the development of kidney damage

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Introduction: TGFβ1 isoform has long been associated with renal fibrosis, but the role of TGFβ3 in renal fibrosis is controversial. Results from our group have shown renoprotective properties for TGFβ3, since partial deficiency of this isoform promoted the development of renal fibrosis and lipid accumulation through the dysregulation of mitochondria and lipid metabolism in male, but not in female mice. Since mitochondrial dysfunction has a crucial role in the development of different diseases, including chronic kidney disease (CKD) and fibrosis, our aim was to elucidate the sexually dimorphic effects of TGFβ3 in the pathophysiology of kidney damage.

Methods: Heterozygous (HZ) TGFβ3 mice and their wild-type (WT) littermates were used. Glucose levels, insulin sensitivity and adiponectin and PAI-1 levels were measured in 16-week-old male and female mice. RNAseq, RT-PCR, WB and zymography were performed in the kidneys of all groups.

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Results: Lack of TGFβ3 did not affect body weight, insulin sensibility, serum PAI-1 or adiponectin levels in mice of both genders. KEEG analysis of the RNAseq data showed a general downregulation of mitochondrial oxidative phosphorylation genes in HZ males compared to their WT littermates, which was confirmed by RT-PCR (mt-Co1, mt-Co2, mt-Nd1 p≤0.05). A decrease in mitochondrial biogenesis and β-oxidation genes was also identify in HZ males compared to their WT littermates (Pparα p≤0.05). These alterations did not occur in kidneys from females. However, the expression of metalloproteinases (MMP) 2 and 9 genes was increased in female HZ compared with WT kidneys. To explore a role for estrogens, we analyzed circulating levels as well as receptor expression within the kidneys. We found decreased estradiol levels in male HZ compared to WT mice (34.6 vs. 66.9ng/ml, respectively, p≤0.05), with no differences in females, and with no major changes in the renal expression of estradiol receptor alpha (ER-α) or beta (ER-β) in any genotype, neither male nor female mice. Interestingly, androgen receptor (AR) was significantly increased in male HZ compared to WT mice, but not in female mice.
Conclusion: Partial loss of TGFβ3 did not affect systemic biochemical parameters, although male mice showed decreased levels of estrogens. At the renal level, TGFβ3 deficiency in males decreased genes involved in oxidative phosphorylation and mitochondrial function. The increase of androgen receptor levels in Hz males, but not in females, could provide a crucial approach for investigating a new renoprotective mechanism, potentially involving sex hormones. Altogether, our results suggest a sex-dependent role for TGFβ3 in mitochondria function and lipid metabolism in the development of renal fibrosis.

PO1.111

Association of body composition parameters and surrogate markers of hip bone quality, in women with overweight or obesity

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Introduction: Body composition parameters are associated with different clinical outcomes in patients with overweight and obesity and might be determinants of bone strength. We aimed to investigate the relationship between body composition variables and surrogate parameters of hip bone quality, in women living with excessive weight.
Patients and Methods: One hundred and ninety-four women with overweight or obesity consecutively evaluated in our Endocrinology Centre were included in this study. All patients underwent dual X-ray absorptiometry (DXA) whole-body scan (DEXA Prodigy®, GE Healthcare #212018). Measurements included total and regional fat and lean mass, as well as total bone mass. Proximal hip DXA scans were analysed for bone geometry by use of the HSA programme and cross-sectional area (CSA), section modulus (SM), and cross-sectional moment of inertia (CSMI) were included in the analysis.
Results: Among the 194 women included, 116 (59.8%) were postmenopausal. Mean age was 50.29 ± 14.01 years and mean BMI was 35.58 ± 6.6 kg/m2. Total bone mass was negatively associated with age (r=-0.262, p<0.001) and positively correlated with BMI (r=0.16, p<0.05), total fat mass (r=0.27, p<0.01) and especially total lean mass (r=0.72, p<0.001). Hip geometry parameters, on the other hand, showed no association with BMI or total fat mass but was negatively correlated with fat mass percentage (r=-0.158 for CSMI, -0.293 for CSA, -0.223 for SM, p<0.05 for all) and also positively associated with total lean mass (r=0.415 for CSMI, 0.527 for CSA, 0.498 for SM, p<0.001)). As expected, age negatively influenced hip geometry parameters, so we decided to perform separate analysis for pre and postmenopausal women. In regression models, lean mass retained its positive association with hip geometry parameters in both pre and postmenopausal women, while fat mass percentage remained a negatively associated parameter only in premenopausal women.
Conclusions: Lean mass seems to be the strongest body composition factor independently associated with hip strength parameters, in women with overweight and obesity

PO1.112

Effects of prolonged lactation on adipsin and its function at the hepatic level

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Introduction: The CFD protein, or adipsin, is primarily synthesized in adipocytes and then secreted into the bloodstream. CFD exhibits various physiological functions: it defends against pathogens by activating the alternative complement pathway; in adipose tissue, it mediates lipid uptake and accumulation, and it also promotes adipogenesis; at the hepatic level, it marks damaged hepatocytes for removal, thereby enabling organ regeneration.
Elevated levels of circulating CFD have been associated with hepatic fibrosis and constitute a significant risk factor for developing NASH (non-alcoholic steatohepatitis) and NAFLD (non-alcoholic fatty liver disease).
Using a rat model, it has been demonstrated that prolonged lactation serves as a protective factor against diet-induced obesity (DIO). In this model (DW, for delayed weaning), prolonged lactation was found to affect circulating levels of various factors, including adipsin.
Objectives: To analyze whether variations in circulating adipsin levels observed with prolonged lactation reflect its variation in different tissues where it has demonstrated physiological effects. Additionally, we aim to identify other proteins altered in the DW model that interact with CFD pathways and its hepatic functions.
Methods: Protein analysis was performed using Western Blot or ELISA. Gene expression analysis was conducted using PCR. Statistical analysis was carried out with GraphPad Prism, employing T-tests for normal data and Mann-Whitney tests for non-normal data.
Results: Proteomic analyses in the DW model revealed that CFD levels were significantly reduced in the plasma of animals subjected to prolonged lactation. This finding was confirmed through Western Blot studies, which demonstrated lower adipsin expression in the DW model, regardless of diet. Additionally, it was observed that maternal milk contains adipsin, with its levels peaking in colostrum and decreasing over the course of lactation.
This reduction in adipsin levels was also found at the hepatic level and in subcutaneous adipose tissue in animals subjected to prolonged lactation.
Conclusions: Adipsin is expressed in maternal milk, with elevated levels in colostrum. Prolonged lactation modulates adipsin levels in offspring, both in the liver and in adipose tissue, which is reflected in circulating levels. This suggests that adipsin may mediate some of the beneficial metabolic effects of lactation.

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PO1.113

Pinitol Improves Lipopolysaccharide-Induced Cellular Damages in Human Dermal Microvascular Endothelial Cells under High Glucose Conditions

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Association between High Glucose and Peripheral Circulation in Obesity.

Introduction: There is a strong relationship between obesity and high glucose levels, as they are interconnected through metabolic and physiological mechanisms. Furthermore, the relationship between adipose tissue and human dermal microvascular endothelial cells (HDMECs) is multifaceted, involving metabolic, inflammatory, and angiogenic pathways. Pinitol (3-O-Methyl-D-chiro-inositol) has been reported to exhibit insulin-like properties and is recognized as an anti-diabetic agent that supports muscle and liver health. However, its effects on human dermal microvascular endothelial cells (HDMECs) under high glucose conditions remain largely unexplored.

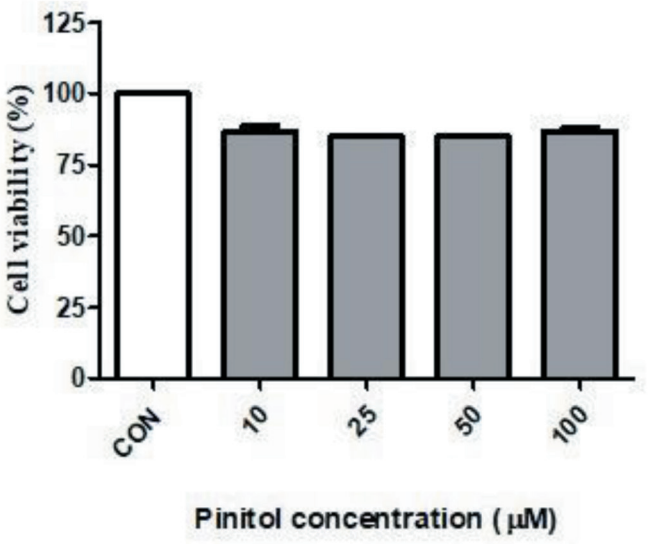
Methods: The effects of pinitol on HDMECs were assessed through wound healing assays in lipopolysaccharide-damaged HDMECs under high glucose conditions. Oxidative stress and mitochondrial function were evaluated by measuring reactive oxygen species (ROS) levels, mitochondrial membrane potential, and ATP activity. Tube formation assay was also performed.

Results: In this study, we evaluated the potential of pinitol to protect HDMECs from damage caused by lipopolysaccharide (LPS), a factor known to induce various cellular defects. Our findings demonstrated that pinitol promoted wound healing in LPS-damaged HDMECs under high glucose conditions compared to low glucose conditions. It significantly reduced LPS-induced reactive oxygen species (ROS) levels and restored mitochondrial membrane potential in these cells. Furthermore, pinitol enhanced tube formation in LPS-damaged HDMECs under high glucose conditions.

Conclusion: These results suggest that pinitol provides multiple protective effects on LPS-damaged HDMECs and holds promise as a therapeutic agent for managing skin vascular-related disorders in high glucose environments.

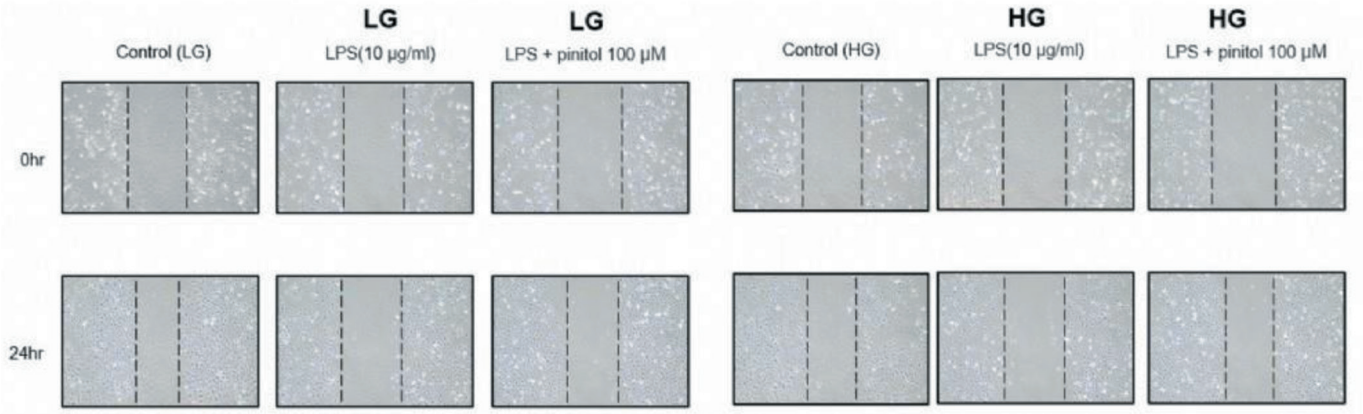
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The cell viability of pinitol in HDMECs was measured by EZ-cytox assay. Pinitol was treated for 24 hours and had a more than 100% cell viability at concentrations of 10, 25, 50 and 100 μM. Cell viability was calculated as the percentage (%) compared to controls. All data are expressed as means ± SD (n=3).

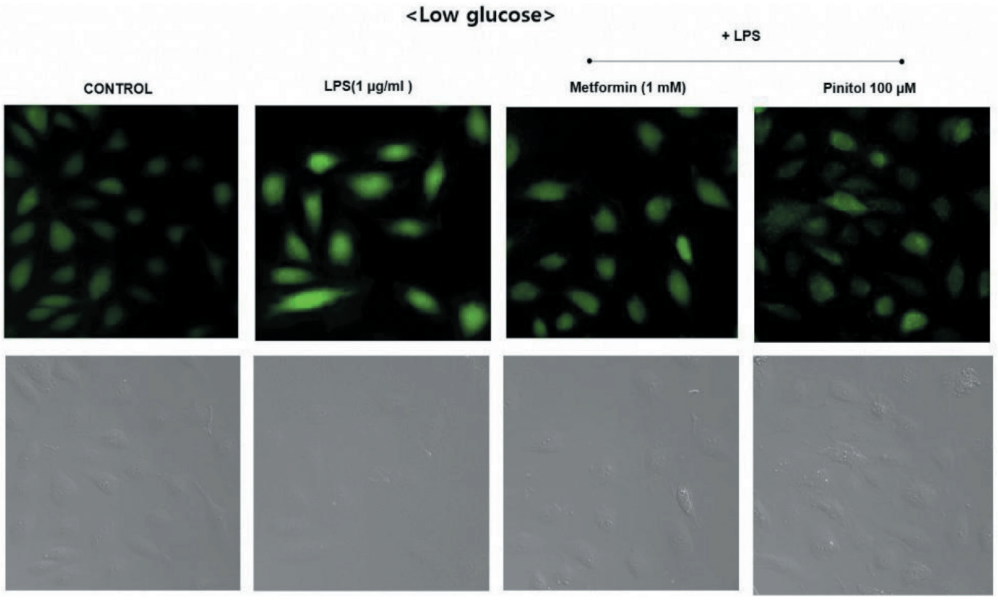
Fig. 1. The cell viability of pinitol in HDMECs.



The wound healing assay of 100 uM pinitol was conducted in LPS-damaged HDMECs under low glucose (LG) and high glucose conditions (HG). Each image was a representative image from three independent experiments.

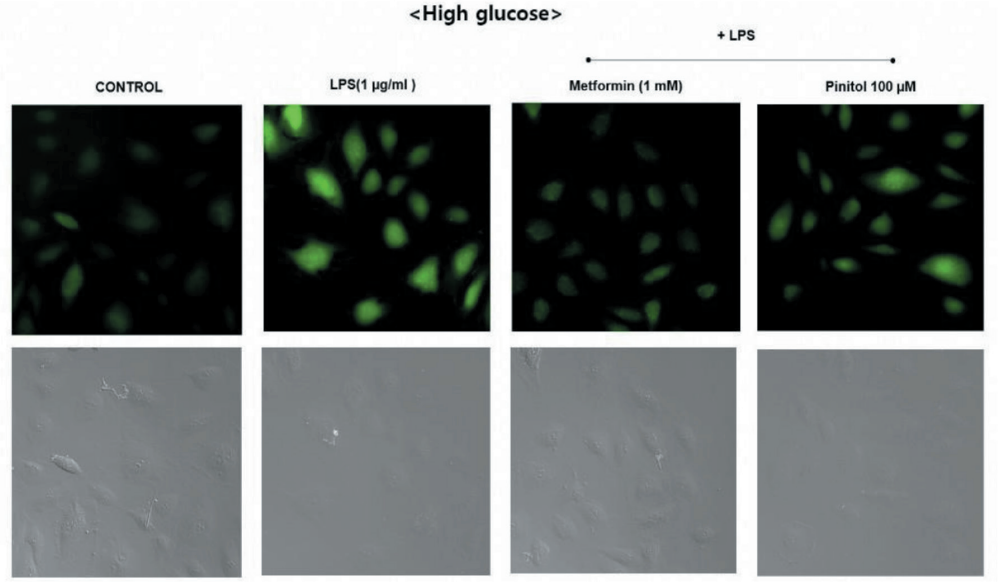
Fig. 2. Wound healing efficiency of pinitol in LPS-damaged HDMECs under high glucose conditions.

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The DCF-DA assay was conducted in LPS-damaged HDMECs. LPS (10 μg/mL) and metformin (1 mM) or pinitol (100 μM) were co-treated for 24 hours. (A) These images show the ROS-reducing effect of pinitol under low glucose conditions

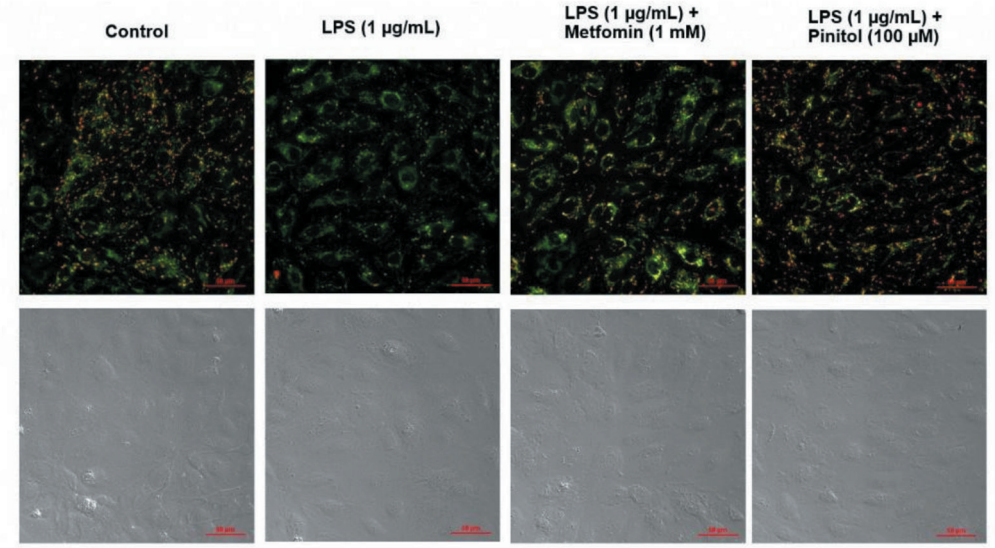
Fig. 3A. ROS levels by pinitol in LPS-damaged HDMECs under low glucose condions.



The DCF-DA assay was conducted in LPS-damaged HDMECs. LPS (10 μg/mL) and metformin (1 mM) or pinitol (100 μM) were co-treated for 24 hours. (B) These images show the ROS-reducing effect of pinitol under high glucose conditions

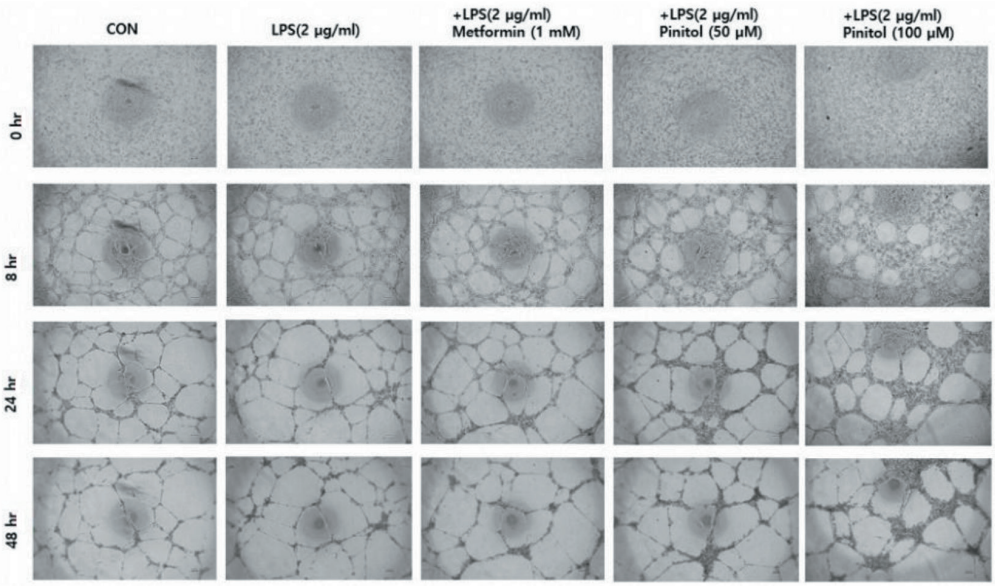
Fig. 3B. ROS levels by pinitol in LPS-damaged HDMECs under high glucose condions.

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The JC-1 assay was conducted in LPS-damaged HDMECs. (A) LPS (10 μg/mL) and metformin (1 mM) or pinitol (100 μM) were co-treated for 24 hours. Each image of JC-1 was captured using a Nikon Eclipse Ti2 fluorescence live-cell imaging microscope.

Fig. 4. The mitochondrial membrane potential by pinitol in the LPS-damaged HDMECs under high glucose conditions.



The tube formation assay was conducted on LPS-damaged HDMECs. (A) LPS (10 μg/mL) and metformin (1 mM) or pinitol (100 μM) were co-treated. Each image was taken at 6, and 24 hours, respectively. Scale bar = 10 μm.

Fig. 5. Tube formation by pinitol in LPS-damaged HDMECs under high glucose conditions.

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PO1.114

Quercetin decreased steatosis by the inhibition of CYP450 on high-fat high-fructose diet-induced model

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Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD) affects 30% of the world's population, mainly persons living with obesity. It has been mentioned the role of cytochrome enzymes in the pathogenesis of MASLD participating in the development of nonalcoholic steatohepatitis and ER stress, initiating lipid peroxidation due to the production of ROS (1). Polyphenols have been linked to a reduction in the risk of several metabolic diseases, and some have been observed to have the ability to modulate the expression and activity of cytochrome P450 (CYP450) enzymes. Therefore, we evaluated the effect of quercetin on the inhibition of CYP450 in a murine model with steatosis.
Methods: We evaluated the inhibition potential of quercetin on CYP2E1 and CYP2B6 by performing "*in vitro*" inhibition studies using the Assay Theory Vivid® CYP450 detection kit. We subsequently analyzed the expression of these enzymes by real-time PCR in liver of Wistar rats with MASLD induced by a high-fat high-fructose diet treated with a daily dose of quercetin (100 mg/kg) for 15 weeks. All the results were analyzed using one-way analysis of variance (ANOVA) followed by Bonferroni post hoc test $p<0.05$ was considered significant.
Results: Quercetin demonstrated an "*in vitro*" inhibitory effect on CYP2E1 and CYP2B6 enzymes with IC50 of 48.4 μM and 46.1 μM respectively. In the "*in vivo*" MASLD model, quercetin reduced steatosis, the hepatic index and morphological changes, improved the biochemical parameters and decreased mRNA expression of cytochrome enzymes.
Conclusion: Our results suggest that polyphenols like Quercetin can reduces hepatic steatosis by inhibiting CYP450 in MASLD and its related comorbidities such as obesity.

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Conflict of Interest: None Disclosed

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PO1.115

Evaluation of the expression level of the microRNA miR-375 in patients living with type 2 diabetes in the department of Lambayeque, Peru

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Introduction: Type 2 Diabetes Mellitus is a multifactorial disease with a high prevalence in the world. Currently, there is no specific biomarker for this disease, and the only methods for its detection are biochemical tests that show greater accuracy when the diagnosis is made at an advanced stage of the disease. Studies on gene regulation of complex diseases suggest that circulating microRNAs can be considered as biomarkers due to their high sensitivity and greater specificity. The microRNA miR-375 is associated with the post-transcriptional regulation of insulin secretion, β-cell function, and blood glucose transport. For these reasons, it was determined to study the expression levels of miR-375 in patients living with type 2 diabetes in the department of Lambayeque, Peru.
Methods: Approval was obtained from the ethics committee of the Belén de Lambayeque Hospital. Informed consent was obtained from all study participants. The medical records of 52 individuals were evaluated; 24 normoglycemic individuals and 28 individuals living with type 2 diabetes from the Belén de Lambayeque Hospital, from which the biochemical values were analyzed. A venous blood sample was taken from both groups, from which the molecular values of the expression level of the microRNA miR-375 were obtained, using the molecular RT-qPCR technique, to later compare the level of expression between the two study groups.
Results: The study consisted of 52 participants, whose levels of fasting plasma glucose, HbA1c, cholesterol, triglycerides and HDL were evaluated. In individuals living with type 2 diabetes, biochemical values were outside the normal range, with significant values for fasting plasma glucose (normoglycemic: 94.08 ± 4.93 mg/dL; individuals living with type 2 diabetes: 188.57 ± 103.34 mg/dL; $p<0.001$) and HbA1c (normoglycemic: 5.07 ± 0.39%; individuals living with type 2 diabetes: 8.04 ± 1.96%; $p<0.001$). Regarding miR-375 values, there was an increase in expression in patients living with type 2 diabetes compared to the normoglycemic group, which was significant with a $p=0.03$.
Conclusion: The expression level of miR-375 showed an increase in the group of patients living with type 2 diabetes compared to the normoglycemic group, which was significant and could be used as a biomarker for early diagnosis of type 2 diabetes.

Conflict of interest: None disclosed

Funding: No funding to report

Tab. 1. Baseline and biochemical characteristic of the study participants.

Charasteristics	Control	Person living with type 2 diabetes
Number of subjects (M/F)	24 (12/12)	28 (14/14)
Age (year)	50,78 ± 6,37	53,44 ± 5,73
BMI (Kg/m2)	26,10 ± 6,33	28,21 ± 5,57
HbA1c (%)	5,07 ± 0,39	8,04 ± 1,96
Fasting Glucose (mg/dl)	94,08 ± 4,93	188,57 ± 103,34
Triglyceride (mg/dl)	142,95 ± 23,97	193,9 ± 60,91
Cholesterol (mg/dl)	197,70 ± 31,25	225,67 ± 48,09
HDL-Cholesterol (mg/dl)	51,20 ± 7,41	47,85 ± 8,10
LDL-Cholesterol (mg/dl)	118,07 ± 24,33	136,99 ± 47,42
VLDL-Cholesterol (mg/dl)	27,88 ± 4,88	37,64 ± 11,50

In individuals living with type 2 diabetes, biochemical values were outside the normal range, with significant values for fasting plasma glucose and HbA1c ($p<0.001$).

PO1.116

Vitamin D influences cold-stimulated thermogenesis and body weight

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Introduction: Adipose tissue plays a critical role in energy storage and metabolic regulation in regards to synthesis and secretion of pro-inflammatory cytokines. Among several types of adipose tissues, brown adipose tissue (BAT) and beige adipose tissue (beige AT) have

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been paid more attention due to numerous studies exploring the mechanisms underlying cold-induced thermogenesis and its therapeutic potential in regulating energy homeostasis and treating metabolic disorders. In addition, the close association between vitamin D status and body weight have been demonstrated in both in vivo and in vitro studies. However, the adaptive thermogenic effects of vitamin D have not been fully elucidated in high fat diet-induced obese mice.
Methods: Male C57BL/6J mice received a low-fat (10% fat) with 1000 IU vitamin D/kg diet, high-fat (60% fat diet) containing either 0 (HF+LVD) or 1000 IU (HF) vitamin D/kg diet for 16 weeks. After overnight fasting, mice were euthanized by CO2 inhalation and blood was collected by cardiac puncture. Rectal temperature was measured in 4 mice in one group subjected to acute cold exposure (4°C 4 hours).
Results: Vitamin D deficient HFD significantly increased body weight and white adipose tissue compared to HFD-fed obese mice. Serum 25-hydroxyvitamin D were significantly lower in HF+LVD group compared to HFD. Higher serum ALT, AST, and IL-1β levels were observed in HF+LVD group. In transmission electron microscopy (TEM) analysis, brown adipose tissue from HF+LVD group displayed bigger lipid droplets in accompanied with significant decrease of rectal temperature compared to HF group.
Conclusions: These observed favorable effect of vitamin D on adipose tissue expansion and body weight might be associated with its thermogenic effect.

PO1.117

Body fat distribution pattern in proneness to sarcopenic obesity in young women of South Asian descent

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Introduction: Sarcopenic obesity is variably characterized by low muscle mass and/or low muscle strength in co-existence with excess adiposity. We investigated, in healthy young women of South Asian (Indian) ancestry in Mauritius, the relationships between low muscle strength or low muscle mass with adverse body fat distribution pattern and blood markers of cardiometabolic risks.
Methods: Data was collected after an overnight fast in young women (n=203) across a wide range of BMI (14-42 kg/m2); all non-active, non-smokers and non-alcohol drinkers. After blood pressure measurements, blood was withdrawn and assays performed for glycemic profile (glucose, insulin, HbA1c), blood lipid profile (triglycerides, cholesterols), and inflammation marker C-reactive protein (CRP). Body composition, appendicular soft lean mass (ALM) and body fat distribution were determined by dual-energy X-ray absorptiometry; central adiposity was assessed as visceral fat and abdominal subcutaneous fat, while peripheral adiposity was assessed as appendicular (limb) fat. Muscle strength was assessed as dominant handgrip strength (HGS). Obesity was defined as body fat% exceeding 40, while low muscle mass and low muscle strength were determined as values below the Asian or European consensus cut-off values for HGS (< 18kg or <16kg), ALM (<15kg), and ALM relative to weight (ALM/W < 0.232) or to height2 (ALMI < 5.5 kg/m2). Data were analyzed using the Wilcoxon Rank Sum test and by linear model procedures, including the analysis of Variance and Covariance.
Results: The main results indicate that among the young women with obesity, those with low HGS showed significantly higher visceral-to-peripheral adiposity ratio (reflecting increased hazardous adiposity relative to protective adiposity) ($p<0.01$), and a tendency for higher blood lipids (triglycerides and LDL-cholesterol), particularly after controlling for ALM (absolute or relative). By contrast, no adverse body fat distribution nor adverse cardiometabolic risk markers were observed in those with low ALM/W or low ALMI, even after controlling for low HGS.
Conclusion: These results in young women indicate differential impact of low muscle strength per se versus low muscle mass per se on cardiometabolic risks and suggest that an increase in visceral-to-peripheral adiposity ratio may be an early event in proneness to adverse cardiometabolic risks associated with diminished muscle strength in early onset of sarcopenic obesity.

PO1.118

Effects of N-acylethanolamines, alone or in combination, on mitochondrial bioenergetics altered by metabolic stress in adipocytes

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Lipid overload induces mitochondrial dysfunction, contributing to obesity and its related comorbidities, mainly through excessive reactive oxygen species (ROS) production. N-acylethanolamines (NAEs) are a class of endogenous lipids synthesized "on demand" from membrane glycerophospholipids, playing key roles in cellular homeostasis. Acting on different receptors, NAEs exert a wide range of pharmacological effects, modulating inflammation, pain, food intake, and neuronal functions. Among NAEs, oleoylethanolamide (OEA) is a potent regulator of satiety, lipid metabolism and energy balance. Similarly, palmitoylethanolamide (PEA) counteracts metabolic inflexibility and mitochondrial dysfunction in obesity. However, stearoylethanolamide (SEA) and linoleoylethanolamide (LEA) have received less attention, despite exhibiting similar bioactivities, including anorectic effects. Recently, the combination of SEA and LEA has been shown to counteract hepatic damage and adipose tissue dysfunction associated with obesity. This study aims to evaluate the individual and synergistic beneficial effect of NAEs on mitochondrial dysfunction and oxidative stress induced by metabolic challenges in adipocytes.
3T3-L1 mature adipocytes were pre-treated with 3 μM of individual NAEs or their combination Olaliamid (OLA), 1–3 μM, for 1 hour before exposure to 100–200 μM palmitate (PA) or 100 nM insulin for 24 hours. Mitochondrial bioenergetics were assessed using the SeaHorse XFe96 metabolic analyzer. Western blot and real-time PCR were performed to analyze the expression of proteins and genes involved in mitochondrial function, thermogenesis and lipid metabolism. The OLA mixture significantly enhanced adipocyte differentiation as evidenced by macroscopic evaluations and increased expression of PPAR-γ. Remarkably, it transformed the white adipocyte phenotype into a brown-like one, promoting the expression of thermogenic genes. Furthermore, OLA treatment improved mitochondrial bioenergetics in mature adipocytes, leading to enhancements in both basal and maximal oxygen consumption, proton leak, and ATP-linked respiration. This was assessed using oligomycin and FCCP, which specifically target the mitochondrial respiratory chain. Furthermore, OLA upregulated key genes involved in lipid metabolism and mitochondrial biogenesis, including PPARα, CPT1, and PGC1α. To model metabolic disturbances seen in obesity, hyperinsulinemia and lipid dysmetabolism were induced by treating adipocytes with high insulin and PA. OLA counteracted these disturbances, improving mitochondrial function and reducing oxidative stress, as evidenced by a decrease in ROS production in PA-challenged adipocytes. Interestingly, all these effects of the OLA mixture were improved compared to those of the individual NAEs. In summary, the combination of NAEs represents a promising therapeutic strategy to counteract obesity and related comorbidities. The multitarget effects of NAEs on mitochondrial function, oxidative stress, and lipid metabolism suggest its potential for the treatment of obesity and its related metabolic disorders by limiting adipose tissue dysfunction and restoring its homeostasis.

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PO1.119

Improved Bioavailability of Alpha-Lipoic Acid Through Cyclodextrin Complexation: A Potential for Enhanced Obesity Treatment

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Introduction: Alpha-lipoic acid (ALA) demonstrates significant therapeutic potential in obesity treatment and associated comorbidities, including diabetic neuropathy and hyperlipidemia. However, effective doses are high (up to 1800 mg daily) and are consequence of poor bioavailability,caused mainly by low solubility and gastrointestinal instability. This leads to high therapy costs and poor patient adherence. The goal of this study was to improve ALA solubility and stability using innovative pharmaceutical formulations based on cyclodextrin (CD) complexation.
Methods: *In silico* screening was used to identify cyclodextrins with the highest potential for enhancing ALA solubility. Experimental validation employing native cyclodextrins and hydroxypropylated derivatives involved phase solubility assessments, preparation of the complexes in the solid state followed by recovery and dissolution studies. Solid complexes were characterized using differential scanning calorimetry (DSC) and X-ray diffraction (XRD) analysis.
Results: Native cyclodextrins demonstrated limited potential for the enhancement of ALA solubility. In contrast, hydroxypropylated cyclodextrins, particularly hydroxypropyl-β-cyclodextrin, significantly improved its solubility and gastrointestinal stability. Complexation with hydroxypropyl-β-cyclodextrin yielded the most promising results in terms of solubility enhancement and dissolution profiles.
Conclusions: Cyclodextrin complexation, specifically with hydroxypropylated derivatives, presents an effective strategy to enhance the bioavailability of ALA. This approach could reduce the required daily dose for obesity treatment, improving patient adherence and reducing therapy costs. Cyclodextrin-based formulations represent a promising avenue for optimizing ALA's therapeutic potential in obesity and its comorbid conditions.

PO1.120

Assessing Perceived Stress and Glucocorticoid Dynamics in Healthy South Asian and Europid People

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Background: The rising incidence of cardiometabolic diseases disproportionately affects South Asians (SA) compared to Europids (EUR)1,2. The increased risk in SA is linked to their unfavorable metabolic phenotype, including central obesity, low muscle mass and insulin resistance3. Of note, this phenotype shows similarities with hypercortisolism, which is evident from the extreme case of Cushing's syndrome, and may suggest increased glucocorticoid activity in SA. Furthermore, perceived psychological stress may stimulate the glucocorticoid system, leading to excessive cortisol secretion.
Aims: This study aimed to compare perceived stress and glucocorticoid dynamics between healthy lean SA and EUR participants.
Methods: In this cross-sectional study, 49 young (age 18-30 years, male and female), lean (body mass index (BMI) 18 – 25 kg/m2) South Asian (n=24) and Europid (n=25) participants living in the Netherlands were included. Anthropometric measurements, perceived stress score (PSS-14; range 0-59), plasma morning cortisol, and hair cortisol and cortisone levels as a measure of long-term glucocorticoid exposure, were assessed.
Results: BMI, fat mass and fat % were higher in SA men vs EUR men (all $p<0.01$), whereas lean mass did not differ. In women, BMI and fat mass were similar, while fat % was higher and lean mass was lower in SA vs EUR (both $p<0.05$). PSS-14 score was higher in SA vs EUR (24.4 ± 7.6 vs 20.7 ± 5.0; $p<0.05$). Plasma cortisol levels were significantly lower in SA vs EUR (467 ± 139 vs 595 ± 167 nmol/L; $p<0.01$), particularly pronounced in SA vs EUR women (454 ± 158 vs 654 ± 207; $p<0.05$). Hair cortisol and cortisone were similar between SA and EUR ($p=0.865$ and $p=0.565$, respectively).
Conclusion: In this study, perceived stress was higher, while plasma morning cortisol levels were lower in SA compared to EUR. Surprisingly, long-term glucocorticoids did not differ. This may fit with increased glucocorticoid receptor sensitivity, alterations in cortisol-binding globulin or a difference in cortisol rhythmicity in SA compared with EUR, which will be further studied.

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PO1.121

Intrauterine growth restriction impact in hepatic antioxidant enzymes in early adulthood

Mutran, T. A. J.; Paula Pedroso, A.; De Souza, A. P.; De Araújo, D. D.; Silva Neto, A. F.; Boldarine, V. T.; Oyama, L. M.; Ribeiro, E. B.; Telles, M. M.

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Introduction: The correlation between oxidative stress and intrauterine growth restriction (IUGR) is well-established, being linked to inflammation, insulin resistance, and obesity in adulthood. Alterations in hepatic metabolism and oxidative stress may contribute. The present study aimed to investigate the consequences of IUGR on the hepatic response to a systemic glucose load.
Methods: For IUGR induction, wistar rats were fed either *ad libitum* (Control group, C) or received 50% of C intake throughout pregnancy (Restricted group, R), and fed *ad libitum* during lactation. The male C and R offspring were fed *ad libitum* from weaning to 90 days-old. They were injected intraperitoneally with either saline (CS and RS) or 2g/Kg glucose (CG and RG), euthanized after 45 min., and had their liver collected and frozen at -80oC until analysis. Hepatic antioxidant enzymes Glutathione Peroxidase (GSH-Px), Superoxide Dismutase (SOD) and Catalase (CAT) protein content were measured by Western blot. Data were analyzed statistically by ANOVA two way and Bonferroni post hoc test ($p<0.05$).
Results: The protein expression levels of CAT, SOD, and GPX-Px were significantly elevated in the control group following glucose injection, with statistical results showing a significant increase for each enzyme ($F = 1.10$; 1.14; 1.14; p-values = 0.0089; 0.012; 0.016, respectively). In contrast, in the males submitted to IUGR, the expression of the SOD and GPX-Px did not show any significant changes post-glucose injection (p-values = 0.1; and 0.81 respectively). Although there was an increase in CAT expression following glucose injection, this change was not statistically significant (p-value = 0.86), indicating an impaired antioxidant response compared to the control group.

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Conclusion: The levels of antioxidant enzymes SOD, CAT, and GSH-Px, which play key roles in neutralizing reactive oxygen species, were significantly increased after glucose load in the control group, while no effect was observed in the IUGR group. These findings suggest that the liver's antioxidant capacity in male rats with IUGR was already compromised by 90 days of age.

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Conflict of Interest: None Disclosed

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PO1.122

Obesity-Associated Microbiota Dysbiosis and Transcriptomic Deregulation in Endometrial Cancer

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Obesity is a significant global health issue, strongly linked to cancer, including endometrial cancer (EC). This study explores the relationship between obesity-associated microbiota dysbiosis and transcriptional deregulation in EC. Using a multiomic approach, we analyzed endometrial tissues from 53 postmenopausal women classified as women with lean (n=33) or overweight/obese (Ow_Ob, n=20) BMI.

Microbiota analysis revealed distinct alpha and beta diversity patterns, with increased Actinobacteria and Proteobacteria in patients with Ow_Ob, alongside reduced Fusobacteria and Bacteroidetes. Species such as Propionibacterium acnes and Micrococcus luteus were significantly enriched, while Faecalibacterium prausnitzii and Prevotella copri were depleted.

Transcriptomic profiling identified 987 differentially expressed genes (DEGs) in Ow_Ob, with 443 upregulated and 544 downregulated. Key DEGs include upregulated DPP4, CCL11, and IL12B, promoting inflammation, and downregulated IGF2, TUG1, and NOTUM, impacting proliferation and metabolic pathways. Correlation analysis highlighted links between microbial species and inflammation-related genes (TLR4, CXCR4) and metabolic regulators (ABCA7, ABCC5).

Our findings underscore the interplay between obesity-induced microbiota dysbiosis and EC, revealing potential targets for therapeutic intervention in obesity-associated cancers.

PO1.123

Impact of Pancreatic Fat on Cardiometabolic Risk Factors in Adults with Overweight or Obesity: Preliminary Results from The EXTREME Project

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Introduction: Ectopic fat, defined as the accumulation of lipids in different organs and tissues, is a crucial marker for the onset, progression, and risk of mortality associated with cardiometabolic diseases.1 However, evidence investigating the relationship between pancreatic fat and cardiometabolic risk remains scarce.2

Methodology: We used baseline data of 185 adults with overweight or obesity (50% women; age: 46.1 ± 8.5 years) from Pamplona and Granada (Spain) participating in the EXTREME randomized control trial (ClinicalTrials.gov: NCT05310721).3 Pancreatic fat fraction was measured by MRI (Siemens 3 T Magnetom Vida). Fasting blood samples were collected to determine triglycerides, cholesterol (total, HDL, and LDL) and glucose regulation parameters (glucose, insulin, and HOMA-IR). Blood pressure (BP) was measured with an automatic monitor (M3-Comfort, Omron).3 Linear regressions were used to examine the associations between pancreatic fat and cardiometabolic risk factors. Differences in cardiometabolic risk factors between adults with (>6.5% pancreatic fat) or without pancreatic steatosis were analysed using analysis of covariance. All analyses were adjusted for age and sex.

Results: Pancreatic fat fraction was inversely associated with HDL (β=-0.142, p=0.050) and directly associated with insulin (β=0.233, p=0.002) and HOMA-IR (β=0.211, p=0.005). No significant associations were found between pancreatic fat percentage and other cardiometabolic risk factors (all p>0.050). Adults with pancreatic steatosis had lower HDL (51±1 vs. 56±1 mg/dl, p=0.004), and significantly higher insulin (13.3±0.7 vs. 10.9±0.6 mUL−1, p=0.006), HOMA-IR (3.14±0.18 vs. 2.63±0.15, p=0.037), and diastolic BP (83±1 vs. 80±1 mmHg, p=0.046) compared to those without it.

Conclusion: Higher pancreatic fat fraction is associated with poorer cardiometabolic health in adults with overweight or obesity. Similarly, those adults with pancreatic steatosis had higher cardiometabolic risk than those without. Therefore, pancreatic fat should be considered a potential target for cardiometabolic risk and its management in this population.

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Conflict of Interest: The authors declare no competing interests.

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PO1.124

Exploring the extracellular matrix component of the adipose tissue, LRG1, in obesity: a potential therapeutic target

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Introduction: Obesity is a widespread health issue defined by the excessive or abnormal accumulation of body fat. Both adipose tissue cells and the extracellular matrix (ECM) play significant roles under both normal and pathological conditions. Leucine-rich α-2 glycoprotein 1 (LRG1), a member of the leucine-rich repeat family of ECM proteins, has been associated with obesity and diabetes. Recent studies have identified LRG1 as a protein secreted by mature adipocytes, suggesting its role as an adipokine that improves insulin resistance in obesity by facilitating communication between adipocytes and hepatocytes. Additionally, LRG1 is involved in skin repair and fibrosis by enhancing TGF-β signaling. Previous findings from our group suggested that LRG1 could serve as a marker of weight gain in visceral adipose tissue. However, its regulation and specific functions within the adipose tissue remain unclear.
Methods: Cell cultures of key adipose tissue cell types —preadipocytes, mature adipocytes, and macrophages (M1 and M2 phenotypes)— were exposed to conditions simulating hyperglycemia/hyperinsulinemia, inflammation, and lipid overload to investigate LRG1 regulation. The impact of LRG1 (chronic and acute treatment with different doses) on adipose tissue cell, including ECM production and fibrillogenesis (e.g., fibrosis), adipogenesis, and macrophage polarization, was also assessed. Electron microscopy studies and molecular techniques (qPCR, western blot, and ELISA) were employed.
Results: Our results revealed that LRG1 is mainly produced by mature adipocytes and M2 macrophages, aligning with the M2a profibrotic phenotype. Inflammation and exposure to the saturated fatty acid, palmitate, were found to up-regulate LRG1 expression in mature adipocytes while down-regulating it in macrophages. LRG1 treatment had no effect on ECM production by preadipocytes, while effects of exposure of mature adipocytes to LRG1 depend on the dose and time of exposure. Under acute stimulation, at a low dose (50 ng/mL), LRG1 decreased the production of ECM regulators, while these and collagens (I, III, VI) increased upon exposure to a higher LRG1 concentration (150 ng/mL). On the other hand, chronic exposure of adipocytes to high dose LRG1 decreased the expression of ECM regulators and collagen VI. Preliminary studies suggested increased levels of adipogenesis markers in preadipocytes chronically exposed to high dose LRG1. In macrophages, LRG1 at a high dose altered M2 gene profile, leading to a profibrotic-like, M2a phenotype. Finally, LRG1 decreased collagen I fibril formation while it had no effect on fibril diameter.
Conclusion: LRG1 exhibits a complex and cell-specific regulatory effect on the adipose tissue under obesogenic conditions. Our data suggest that LRG1 may disrupt adipose tissue homeostasis by influencing ECM remodeling and macrophage M2 phenotype, which could contribute to adipose tissue fibrosis and insulin resistance.

PO1.125

Effects of metformin on glucose homeostasis after bariatric and metabolic surgery

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Introduction: Bariatric and metabolic surgery (BMS) induces significant and sustained weight loss, accompanied by improvement or remission of type 2 diabetes (T2D). An enhanced secretion of incretin, such as GIP and GLP-1, may contribute to T2D remission following BMS. Additionally, metformin could promote intestinal GLP-1 secretion, potentially amplifying the impact of BMS on T2D management. Which leads to wonder whether a combination of BSM with metformin could improve diabetes remission.
Methods: Goto-Kakizaki rats (a murine model of T2D characterized by hyperglycemia associated with insulinopenia) underwent one of two main types of bariatric and metabolic surgery: Roux-en-Y gastric bypass (RYGB, n=22) or sleeve gastrectomy (SG, n=19). These groups were compared to a control group undergoing a sham procedure without anatomical modification of the gastrointestinal tract (Sham, n=19). Post-surgery, rats were treated or not with metformin for three weeks per os. An insulin sensitivity test and a test meal were performed, during which blood samples were collected to measure glycemia and fasting and postprandial levels of GIP, GLP-1, and insulin. Kruskal-Wallis tests were employed to compare the outcomes between the 3 groups. a two-way ANOVA followed by Tukey's post hoc tests were conducted for comparisons involving kinetic studies. Statistical significance was defined as $p<0.05$.
Results: Six weeks after BMS, fasting blood glucose levels were reduced following RYGB ($p<0.001$) or SG ($p=0.08$) compared to Sham. The kinetics of glucose response to a test meal was modified, as evidenced by a significantly steeper slope in the glucose curve compared to Sham ($p=0.024$ Sham vs. RYGB, $p=0.026$ Sham vs. SG). Incretin secretions (GLP-1 and GIP) in response to the test meal were significantly increased after RYGB and SG compared to Sham ($p=0.04$ and $p=0.007$, respectively), while no significant effect on insulin secretion was observed. A 3-weeks long Metformin treatment by itself improved glucose tolerance, as shown by a lower glucose peak and enhanced insulin sensitivity compared to non-treated animals ($p=0.026$). However, no significant effects on incretin or insulin secretion were observed following metformin treatment. Combining Metformin treatment with BMS tended to enhance the effect of BMS on glucose tolerance, resulting in an earlier and lower glucose peak during the test meal. However, metformin did not have an additional effect on already increased incretin secretions nor on insulin secretion after BMS.
Conclusion: Glucose tolerance, insulin sensitivity, and incretin secretion were improved following bariatric and metabolic surgery. Addition of metformin to the BMS further improved the glycemic response with no impact on incretin or insulin secretions. The underlying mechanisms remain under investigation and may involve alterations in intestinal glucose metabolism. However, this study highlights the potential clinical relevance of combining metformin therapy with BMS to maintain positive impact on T2D in the long term.

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PO1.126

Depot-Specific Screening of Human Adipose Stromal Vascular Cells by Mass Cytometry

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Introduction: Obesity is classically defined as excessive body fat accumulation. As the primary site of fat storage, white adipose tissue (WAT) is an immuno-metabolic organ with a central role in regulating systemic hemostasis. WAT is distributed at various anatomical locations, commonly categorized into subcutaneous (SAT) and visceral adipose tissue (VAT). Accumulation of VAT is associated with a higher risk of cardio-metabolic complications compared to SAT expansion. In addition to the adipocytes, adipose tissue contains a diverse array of cell populations such as immune cells, endothelial cells, and a heterogeneous population of multi-potent mesenchymal stem cells in its stromal vascular fraction (SVF). This study aims to characterize the surface marker expressions and compare the cellular composition of the SVF between SAT and VAT.
Methods: Adipose tissue biopsies were obtained from participants with obesity undergoing bariatric surgery. The SVF was isolated by enzymatic digestion. Cell surface proteins were labeled by a panel of primary antibodies conjugated to different metal isotopes. Subsequently, the cytometry by time-of-flight (CyTOF) was implemented to assess the expression of surface markers at a single-cell resolution. Cellular composition and heterogeneity were compared between the SAT and VAT using dimensionality reduction and clustering analysis.
Results: We observed significant depot-specific differences in the proportions of various cell types. Furthermore, the clustering analysis identified differentially enriched cell populations between SAT and VAT with distinct surface phenotypes. Details on specific cell types and surface markers will be presented.
Conclusion: Our study demonstrates the implementation of mass cytometry in characterizing the cellular heterogeneity in human adipose tissue. Our findings highlight depot-specific cellular heterogeneity in human WAT depots and may offer further insights into their varying metabolic and immunological properties.

Conflict of Interest: None Disclosed

Funding: No funding to report

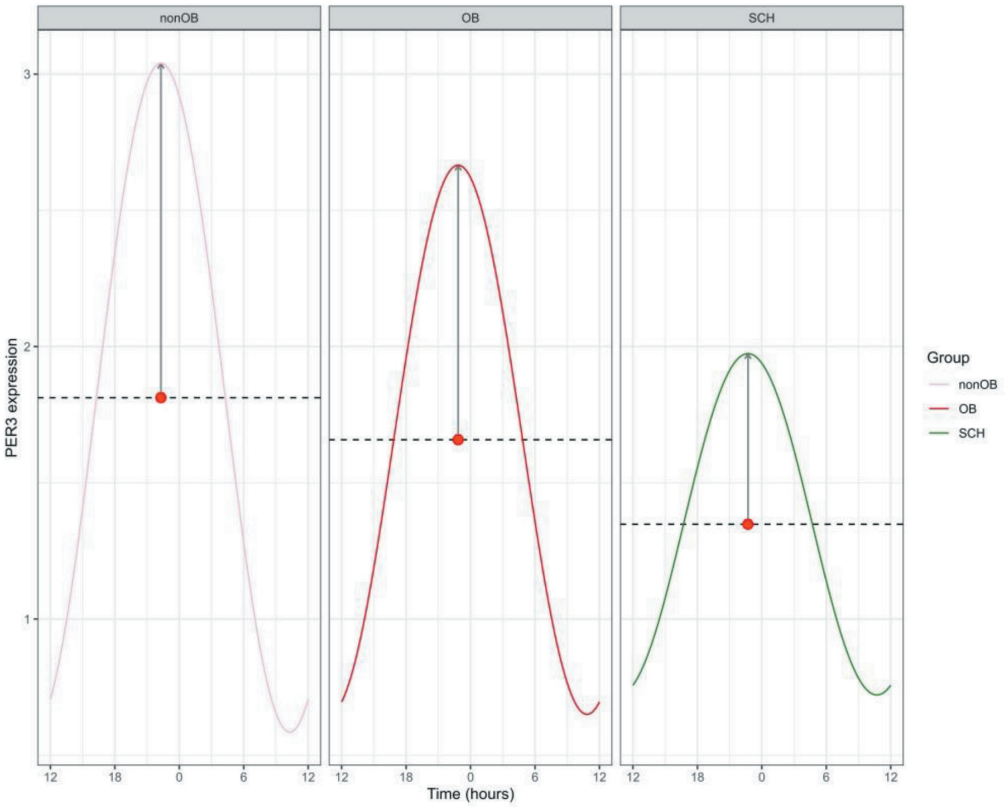
PO1.127

Disrupted Circadian Rhythms in Individuals with Mental Disorders and Obesity

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Introduction: Circadian rhythms are 24-hour biological processes that influence physiological functions such as the sleep-wake cycle, hormone release, energy metabolism, and psychological functions. Disruptions in these rhythms are associated with severe health consequences, including metabolic diseases, obesity, and psychiatric disorders. These rhythms



The figure displays differences in the rhythmic expression of PER3 in hair follicles sampled over two days across participant groups. Horizontal dashed lines represent the MESOR (circadian-adjusted mean), vertical lines indicate the amplitude, and the red dot marks the peak expression time, adjusted for accelerometry-derived wake-up times. Abbreviations: SCH = Participants with schizophrenia and obesity, OB = Participants with obesity without schizophrenia, nonOB = Participants without obesity or schizophrenia.

Fig. 1. Circadian expression of PER3.

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are driven by molecular mechanisms involving clock genes, including the Period 3 (PER3) gene, which regulates and synchronizes biological functions with external cues like light and darkness. Disturbed clock gene expression have been linked to sleep disorders and mental health conditions.

Methods: We included 66 participants divided into three groups: individuals with schizophrenia and obesity (SCH), individuals with obesity but no mental disorders (OB), and a control group without obesity, mental disorders, or sleep disturbances (nonOB). Participants were matched for BMI, age, sex, and sleep apnea status. Over two days, participants collected saliva and hair samples in their own homes. Saliva samples were analyzed for circadian rhythms in cortisol and melatonin levels, while hair follicles were analyzed for clock gene expression using qPCR. Sleep quality was assessed using accelerometry (Axivity AX3) and the Pittsburgh Sleep Quality Index (PSQI) questionnaire. Group differences were analyzed using Kruskal-Wallis test with post hoc tests for group differences. Mixed-effects cosinor models were used to evaluate circadian rhythm parameters: MESOR (circadian-adjusted mean), amplitude, and acrophase.

Results: Compared with the OB and nonOB groups, SCH reported worse self-assessed sleep quality (Median (Q1, Q3) PSQI score: SCH 11.00 (6.00, 16.50) vs. OB 5.00 (3.00, 9.00) vs. nonOB 4.00 (2.00, 5.75), $p < 0.01$), longer sleep durations (Median sleep time: SCH 7.51 (6.75, 8.04) vs. OB 6.94 (5.85, 7.23) vs. nonOB 6.70 (6.44, 7.16), $p < 0.01$), and reduced PER3 amplitude (Mean (95% CI): SCH 0.63 (0.38, 1.13) vs. OB 1.01 (0.73, 1.35) vs. nonOB 1.23 (0.97, 1.52), $p < 0.01$). The PER3 MESOR was lower in the SCH group (Mean (95% CI): SCH 1.35 (0.90, 1.72) vs. nonOB 1.81 (1.41, 2.08), $p = 0.03$), while no differences were found between the OB group (1.66 (1.25, 1.91)) and the nonOB group ($p = 0.49$). For salivary melatonin, the SCH group exhibited a significantly lower amplitude compared to the nonOB group (Mean (95% CI): SCH 3.15 (1.32, 5.25) vs. nonOB 6.33 (4.20, 8.98), $p < 0.001$). No other group differences were found in PER3, hormonal rhythms, or sleep parameters.

Conclusion: The reduced PER3 amplitude and MESOR in the SCH group may indicate a diminished capacity to regulate biological rhythms in people with schizophrenia, potentially affecting sleep, metabolic and psychological processes.

PO1.128

Differential expression of serum and exosomal microRNA-34a in subjects with increased fat mass

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Introduction: Adipose tissue (AT) is recognized as a key source of circulating extracellular vesicles (EVs), specifically adipocyte-derived extracellular vesicles (AdEVs), which play a critical role in intercellular communication. These EVs transport biological material, including microRNAs, between adipocytes, stromal cells within the AT, and other systemic cells. Among these microRNAs, the miR-34 family includes three members: miR-34a, miR-34b, and miR-34c. miR-34a is predominantly expressed in adipocytes and macrophages and regulates of immune and metabolic functions within AT. This study aimed to evaluate the relative expression of miR-34a in serum and circulating exosomes from individuals with normal and high-fat percentages.

Methods: Adults (n=142) were categorized by normal and high body fat percentage: Normal: men < 25%, women <35%, High: men ≥ 25%, women ≥ 35%. Insulin resistance (IR) status, high molecular wight adiponectin, CCL2 and chemerin were measured by Enzyme-Linked ImmunoSorbent Assay (ELISA), inflammation biomarkers, and lipid profile by immunoturbidimetric method. Exosomes were isolated by Total Exosomes Isolation kit (Invitrogen®) and characterized by cryo-TEM, miR-34a was quantified using qRT-PCR.

Results: Serum miR-34a expression showed a negative correlation with C3, pCr, AdipoQ-H, Chemerin, CCL2, and LDLc, and a positive correlation with insulin resistance status indicators. In contrast, circulating exosomal miR-34a showed a negative correlation with lipid profile, fasting glucose, and QUICKI, while a positive correlation with AdipoQ-H and fasting insulin was shown. The expression levels of miR-34a were higher in serum than in EVs.

Conclusion: We suggest that increased relative expression of serum miR-34a is a promising biomarker for assessing the clinical manifestation of inflammation and insulin sensitivity within AT.

PO1.130

Visceral obesity mapping: new cut-off points for visceral obesity risk stratification in women

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Background: Excessive visceral adipose tissue (VAT) accumulation is a significant risk factor for cardiometabolic disorders. Despite growing recognition of VAT's importance for women's health, data on VAT thresholds are ambiguous and need validation. Determining optimal VAT cut-off points remains extensively researched, with thresholds varying by age, gender, and ethnicity. Establishing precise VAT cut-off points for ethnically homogeneous populations could improve risk assessment in primary healthcare, enable gender-specific interventions, and enhance treatment monitoring. Standardized cut-off points would facilitate research comparisons, leading to targeted therapies for women.

Objective: The study aimed to determine optimal visceral adipose tissue (VAT) cut-off points for adult and elderly women based on established anthropometric indicators: waist circumference (WC), body mass index (BMI), waist-to-height ratio (WHtR), and body fat percentage (BF%).

Methods: This cross-sectional study was conducted at the Department of Functional Diagnostics and Physical Medicine at the Pomeranian Medical University in Szczecin, involving 930 women aged 18-87 years. Body composition was assessed using the Hologic Horizon Dual-energy X-ray absorptiometry (DXA) System (Quirugil, Bogota, Colombia) with Discovery software version 12.3 (Bellingham, WA, USA). Three VAT parameters were analyzed: area (cm^2), mass (g), and volume (cm^3) in relation to four reference variables: body mass index (BMI), waist circumference (WC), body fat percentage (BF%), and waist-to-height ratio (WHtR). ROC curve analysis and Youden's index were utilized to determine optimal VAT cut-off points.

Results: VAT parameters showed the highest diagnostic value in relation to WC (AUC = 0.917, SE = 0.009, 95% CI: 0.898-0.935, $p < 0.0001$), with the highest Youden index of 0.73. For this relationship, the following cut-off points were determined: VAT-area 47.16 cm^2, VAT-mass 227.35 g, VAT-volume 245.78 cm^3. High AUC values were also obtained for BF%

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(0.885), WHtR (0.884), and BMI (0.883), with Youden indices of 0.64 for BF% and WHtR, and 0.63 for BMI. All three VAT parameters showed similar diagnostic efficacy for each reference variable ($p < 0.0001$).

Conclusions: WC emerged as the optimal reference indicator for determining VAT threshold values in women, as confirmed by the highest AUC values and Youden index. The established cut-off points may serve as a precise diagnostic tool in clinical practice for identifying patients at elevated risk of visceral obesity and subsequent cardiometabolic diseases. Future research should focus on validating these cut-off points in larger, diverse female populations.

Conflict of Interest: None declared

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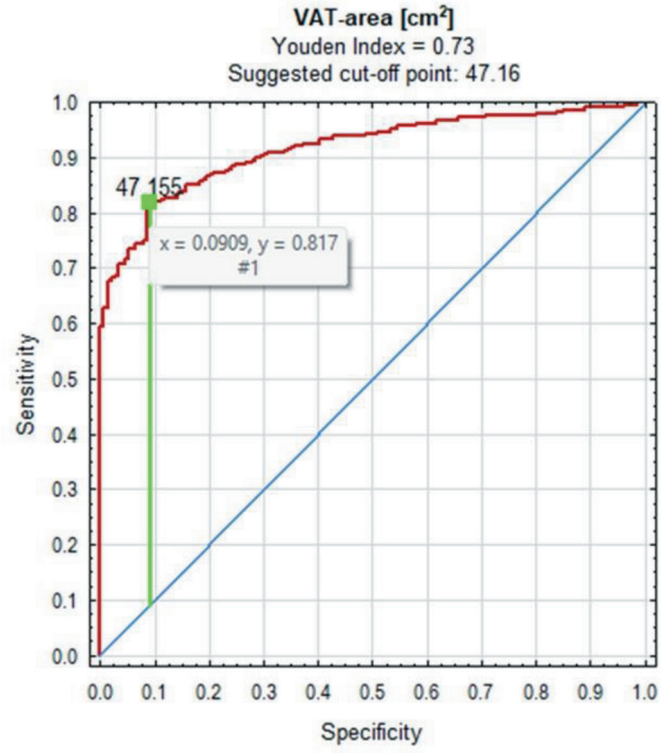


Figure 1. ROC curve analysis for determining the optimal VAT – area cut-off point based on CW classification. The area under the curve (AUC) = 0.917 (95% CI: 0.898-0.935, SE = 0.009, $p < 0.0001$). The diagonal line represents the reference line (AUC = 0.5).

Fig. 1.

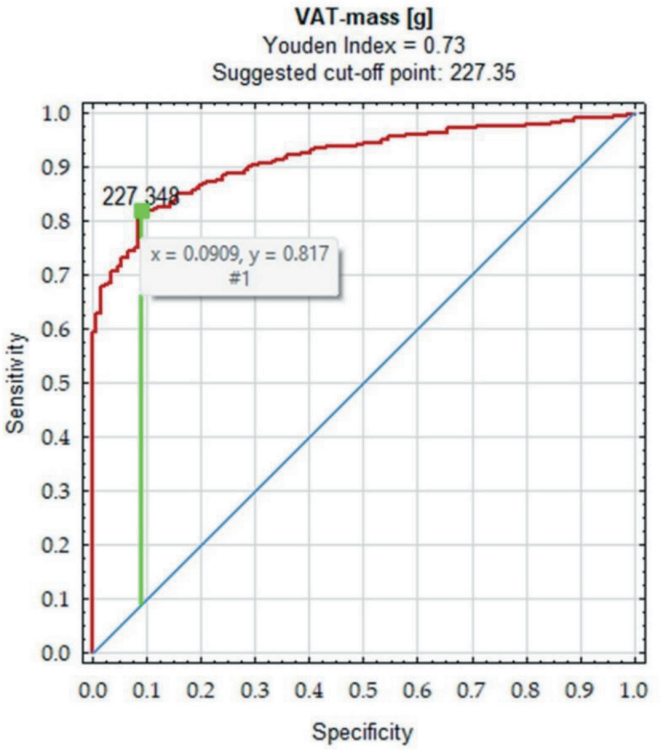


Figure 2. ROC curve analysis for determining the optimal VAT – mass cut-off point based on CW classification. The area under the curve (AUC) = 0.917 (95% CI: 0.898-0.935, SE = 0.009, $p < 0.0001$). The diagonal line represents the reference line (AUC = 0.5).

Fig. 2.

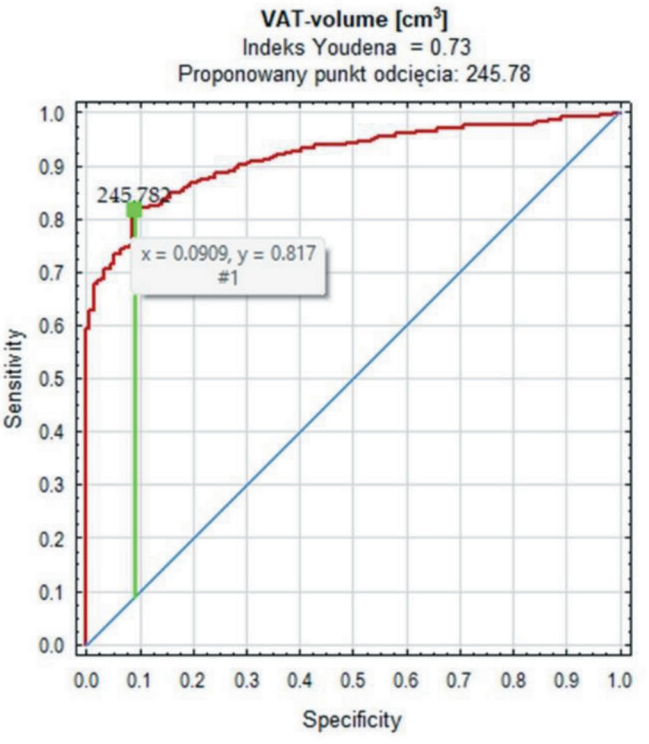


Figure 3. ROC curve analysis for determining the optimal VAT – volume cut-off point based on CW classification. The area under the curve (AUC) = 0.917 (95% CI: 0.898-0.935, SE = 0.009, $p < 0.0001$). The diagonal line represents the reference line (AUC = 0.5).

Fig. 3.

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PO1.131

Validation of visual analogue scales in Spanish, to measure satiety and appetite in human studies

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Controlling satiety and hunger in humans, and therefore caloric intake through food, is a key aspect in dealing with obesity. Visual analogue scales (VAS) surveys are one of the most widely used methods to measure hunger and satiety in human studies, being therefore a key tool in satiety research, but to this day, there are no validated VAS surveys in Spanish. This study was conducted with human participants to validate the use of VAS surveys in Spanish (n=21), using a test-retest study design. The volunteers had a standard breakfast and then answered the VAS surveys several times during a total period of 180 minutes. The entire process was repeated under the same conditions on a different day. The results showed a good degree of agreement and no statistically significant differences ($p < 0.05$) between the different study days, so it can be concluded that the developed EVA in Spanish, is adequate and valid to evaluate appetite sensations in human studies for Spanish speakers.

PO1.132

The importance of preoperative weight loss in patients with morbid obesity

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Introduction: Bariatric surgery is regarded as the most effective treatment for managing morbid obesity. However, proper preoperative preparation is essential to optimize outcomes and minimize associated risks. In this context, pre-surgical weight loss plays a critical role and should be carefully considered.
Objective: To evaluate the role of preoperative BMI in the weight loss trajectory and metabolic improvements observed after surgery.
Materials-Methods: The study included 20 patients with morbid obesity who underwent sleeve gastrectomy and were monitored before and 6 months after bariatric surgery. Prior to surgery, patients participated in a weight loss nutrition program, and the percentage of weight change (%WC) and BMI change (%BMIC) were calculated. Various anthropometric and biochemical parameters were also analyzed before and after surgery. Total weight loss (%TWL) and excess weight loss (%EWL) were calculated 6 months post-surgery.
Results: Patients lost 52% of their excess weight and 25% of their total weight at 6 months post-surgery. %EWL showed a positive correlation with %WC (p=0.037), while %TWL positively correlated with both %WC (p=0.016) and %BMIC (p=0.027). In an analysis of variance to identify variables associated with %EWL after surgery, only preoperative BMI (p=0.002) and %WC (p=0.020) were found to significantly explain %EWL, with an R^2 of 0.552 (Confidence Interval: 1.708–0.166 and 1.839–0.468, respectively), adjusted for age, sex, and DM2 medication.
Discussion: The results of this study emphasize the importance of assessing and optimizing preoperative BMI, as it appears to play a critical role in the short-term outcomes of bariatric surgery.

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PO1.133

Long-term effects of postnatal low-dose bisphenol S exposure on mitochondrial respiration and changes in liver and adipose tissue of adult mice on normal or high-fat diets

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Introduction: Bisphenol S (BPS), an endocrine-disrupting chemical, is used in many consumer products and is released into the environment, water and food from plastics, textiles, personal care products and food packaging materials. Exposure to BPS occurs through ingestion, inhalation, and dermal contact.
In an experiment in male mice, we studied the long-term effect of 3-week postnatal exposure to BPS (from birth to weaning) on adipose and liver tissues of adult mice fed a standard or high-fat mice chow.
Methods: Offsprings were exposed to BPS via breast milk of dams who were given BPS in their drinking water. The dose of BPS was approximately 0.1ng/g bw/day which corresponds with estimated BPS exposure in the general population. From the postnatal day 15, the offspring are not exclusively breastfed, and the exposure was partially mediated by water intake. After weaning, animals of BPS exposed and the control group were randomized to a normal or high-fat diet (HFD) until the end of the experiment (upon reaching the adult age of 12-18 weeks). Animals were then weighed, euthanized, and livers, epididymal white adipose tissue pads (eWAT), brown adipose tissue pads and serum samples were collected.
Liver and eWAT were evaluated histologically. Liver and eWAT mitochondrial respiration was determined using high-resolution respirometry. Total antioxidant capacity (TAC) and the levels of total antioxidant capacity (TAC), alanine aminotransferase (ALT) and aspartate aminotransferase (AST) were measured in serum.
Results: In both male and female mice, the eWAT mitochondrial respiration was significantly decreased in HFD-fed mice compared to mice exposed to BPS and fed with a normal diet. Perinatal BPS exposure seemed to counteract the effect of HFD in female mice. This effect of BPS was less pronounced in male mice. In liver samples, the HFD in female mice increased the active phosphorylating respiration (OXPHOS-FAO), OXPHOS-FAO+I, OXPHOS-FAO+I+II. In BPS groups this effect of HFD was not seen. In male mice, the impact of HFD alone was not significant, but in HFD-fed animals exposed to BPS were significantly (vs. control group) decreased OXPHOS-FAO+I, OXPHOS-FAO+I+II, maximal electron transporting system capacity and compared to HFD group, the Complex IV capacity. In male mice, the HFD diet significantly increased the TAC and ALT activity. In BPS+HFD male mice, the ALT activity was significantly higher than in the HFD group. In female mice, no significant change in ALT activity was seen.
The histological analysis showed larger profiles of adipocytes in the BPS+HFD group. Hepatocytes of HFD and BSP+HFD groups contained lipid droplets indicating the presence of steatosis. Small areas of necrosis with lymphatic infiltration were found in the liver tissue of BPS groups.

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Conclusion: Exposure to low doses of BPS during the critical postnatal period of development can have long-lasting effects on mitochondrial respiration in the liver and adipose tissue and can alter the physiological response to a high-fat diet.

Conflict of Interest: None Disclosed

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PO1.134

New challenges and molecular approaches to adipose damage associated with obesogenic medications

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Introduction: Obesity is a complex and costly chronic disease defined by an excessive or abnormal expansion of adipose tissue. The etiology of obesity is multifactorial, including hypercaloric food, physical inactivity, stress, environmental, genetic and/or socio-economic factors. A growing body of evidence shows that certain medications might also contribute to the obesity epidemic. Specifically, the integrase inhibitor Dolutegravir (DTG), one of the most widely used first-line treatment for human immunodeficiency virus (HIV), has been suggested to cause weight gain and deleterious effects on adipose tissue physiology, including fibrosis. In this scenario, the main objectives of this work were to delve into the impact of DTG on adipocyte function and identify serum biomarkers of adipose tissue damage in a cohort of HIV patients treated with DTG or other antiretroviral drugs (ART).
Methods: *In vitro* studies were carried out to assess the effects of DTG and/or other ARTs on both adipocyte differentiation and mature adipocytes and cell function was analyzed by several techniques (immunoblotting, qRT-PCR, etc.). Besides, a proteome study of serum from patients infected with HIV (Reina Sofía University Hospital, Córdoba) treated with DTG (n = 106) or with other ARTs (n = 214) was also carried out and the results were analyzed in relation to the presence of normal weight, overweight or obesity.
Results: DTG exposure impaired adipocyte differentiation, decreasing lipid accumulation, which may be related to its effects on both mitochondrial protein complexes and lactate production. Moreover, DTG-treated mature adipocytes showed altered glucose and lipid metabolisms and an increased secretion of the obesogenic adipokine, FABP4. Proteomic analysis pointed to Thrombospondin-1 (TSP1), an extracellular matrix glycoprotein implicated in metabolic diseases, as a potential biomarker associated with adipose tissue damage in patients infected with HIV treated with this obesogenic drug. Interestingly, the DTG-induced increase in serum TSP1 levels in patients infected with HIV and with overweight appeared to be reversed when the patients were concurrently treated with another ART, Rilpivirine.
Conclusion: Our studies show that DTG strongly alters adipocyte functionality, acting mainly at the mitochondrial level as well as on lipid and glucose metabolism. Finally, TSP1 serum levels in DTG-treated patients infected with HIV could represent a potential biomarker of adipose tissue dysfunction.

PO1.135

New Perspectives on the Impact of Empagliflozin on Hepatic Dysmetabolism in Diabetic Obese Zucker Rats

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Empagliflozin (EMPA), a sodium-glucose cotransporter 2 (SGLT2) inhibitor, is an emerging hypoglycemic agent recognized for its effectiveness in managing obesity, type 2 diabetes mellitus (T2DM), cardiovascular diseases, and other metabolic disorders. Despite these established benefits, the mechanisms by which EMPA may counteract Metabolic Associated Fatty Liver Disease (MAFLD) remain poorly understood. This study aimed to investigate the effects of EMPA on liver dysfunction in diabetic obese Zucker Diabetic Fatty (ZDF) rats, a model representing obesity and early-stage T2DM characterized by elevated insulin levels and glucose intolerance in both the liver and skeletal muscle.
Male ZDF rats (ZDF-Leprfa/fa) were fed a diabetogenic diet, reaching fasting glucose levels of 350.75 ± 18.59 mg/dL at 12 weeks of age. They were then treated with EMPA (30 mg/kg/day) in drinking water for six weeks. Hepatic glucose and lipid metabolism, as well as markers of inflammation and fibrosis, were assessed using Real-Time PCR, Western blot analysis, and histological and serological evaluations.
Our findings revealed that empagliflozin (EMPA) activated the insulin signaling pathway by increasing phosphorylation of its receptor (InsR) and stimulating the PI3K/AKT pathway. Concurrently, EMPA inhibited hepatic gluconeogenesis by downregulating the mRNA expression of key enzymes involved in this process, including phosphoenolpyruvate carboxykinase (Pck1) and glucose-6-phosphatase (G6pc). Additionally, EMPA enhanced hepatic lipid metabolism, as evidenced by increased AMPK phosphorylation, which aligned with improvements in the dysregulated lipid profiles observed in ZDF rats. EMPA treatment regulated the expression of genes critical for fatty acid metabolism, notably reducing cluster of differentiation (CD)36, a fatty acid transporter linked to hepatic steatosis, alongside FOXO-1. Furthermore, EMPA elevated the expression of peroxisome proliferator-activated receptor (PPAR)-γ, its coactivator PGC1-α, and fatty acid binding protein (FABP)1, all of which play essential roles in mitigating hepatic free fatty acid accumulation. EMPA also boosted the expression of uncoupling protein (UCP)2 and the mitochondrial transporter ATP-binding cassette (ABCG)1, indicating an enhancement of mitochondrial function, which is typically compromised in diabetic conditions. The study also demonstrated that EMPA alleviated hepatic inflammation and fibrosis associated with insulin resistance. Notably, EMPA promoted immune cell recruitment and induced the production of resolvins, including annexin A1, a key factor in resolving inflammation in conditions such as diabetes, obesity, and steatohepatitis. Additionally, altered transcriptional and protein expression levels of SGLT-2 and SGLT-1 in the liver of EMPA-treated mice suggested that mechanisms beyond its primary pharmacological action might contribute to its effects.
Overall, this study highlights the multifaceted potential of EMPA as a therapeutic agent to address MAFLD in the context of obesity and diabetes, offering new insights into its mechanisms of action and therapeutic applications.

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PO1.136

Targeted Delivery of Tamoxifen in Adipose Tissue via Peptide-Based Drug Targeting in a Mouse Model

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The selective estrogen receptor modulator Tamoxifen (Tmx) has demonstrated efficacy in reducing body fat in murine models (N. Hesselbarth et al., 2015), indicating its potential for the treatment of obesity. However, the administration of the drug systemically carries the risk of significant adverse effects due to the non-specific targeting of tissues. To address this issue, we investigated a novel delivery strategy utilizing [F7, P34]-NPY-coupled Tamoxifen ([F7, P34]-NPY-Tmx). This peptide has been demonstrated to selectively bind to NPY1 receptors expressed on adipocytes, making it an ideal shuttle for targeted drug delivery (R. M. Söll et al., 2001). This peptide has previously been demonstrated to be an effective shuttle for the delivery of the PPARγ modulator Tesaglitazar (S. Wittrisch et al., 2020).
In this study, a diet-induced obesity mice were administered [F7, P34]-NPY-Tmx via subcutaneous or intraperitoneal routes at doses of 1 mg/kg/day and 2 mg/kg/day, respectively, for a period of one week. Subsequently, phenotypic characterisation and histological analyses were conducted to assess changes in adipocyte morphology and the overall metabolic state, following the conclusion of the treatment period.
Our initial findings indicated that the route of administration has a significant impact on the therapeutic outcomes. The intraperitoneal administration was observed to demonstrate superior efficacy in comparison to the subcutaneous injection, as evidenced by a more pronounced reduction in adipocyte size and improved metabolic markers within the adipose tissue. This indicates that targeted delivery using the [F7, P34]-NPY peptide not only enhances the specificity of Tmx action but also minimises off-target effects, thus optimising the therapeutic benefits.
RNA sequencing (RNAseq) analysis in adipose samples facilitate a more profound comprehension of the molecular pathways impacted by the Tmx and [F7, P34]-NPY interaction, which may potentially lead to the discovery of novel insights into adipocyte-specific responses and mechanisms of action.
These preliminary results highlight the potential of peptide-based targeting systems in the management of obesity. By facilitating selective drug delivery to adipose tissue, [F7, P34]-NPY-Tmx represents a promising approach to improving therapeutic outcomes while minimising systemic side effects. Further studies, including RNAseq data analysis, will be essential for validating these findings and supporting future clinical translation efforts.

PO1.137

GLP-1, GIP, and glucagon excursions during a mixed meal tolerance test in young and lean South Asian versus Europid males and females

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Background: South Asians exhibit an unfavorable metabolic phenotype that is characterized by visceral obesity, insulin resistance and dyslipidemia. Since various hormones are critical for regulating energy metabolism, we aimed to study the meal-induced excursion of incretin hormones and glucagon and parameters related to glucose and lipid metabolism in young, lean South Asian and Europid males and females.
Method: 49 young (age 18-30 years, including both genders), lean (body mass index 18.5-25.0 kg/m2) South Asian (n=24), and Europid (n=25) participants underwent an extended (up to 240 min) mixed meal tolerance test (MMTT). At seven time points during the MMTT, circulating incretins (active and total GLP-1 and GIP), glucagon, and parameters related to glucose and lipid metabolism were measured.
Results: While a single peak (t=30 min) in circulating glucose levels was observed in Europids, a biphasic peak (t=30 and t=90 min) was observed in South Asian males and females. Similarly, South Asian males exhibited a biphasic insulin response, with a higher total area under the curve (tAUC¬0-240). On the other hand, South Asian females demonstrated a drop in circulating glucagon at t=90 min, and biphasic peaks of total and active GLP-1 and GIP (t=30 and t=120 min onwards), resulting in significantly increased tAUC60-240 for active GLP-1 and GIP in South Asian compared to Europid females.
Conclusion: South Asians respond to an MMTT with a biphasic peak in glucose levels, and, potentially as a consequence, female South Asians demonstrated a second peak of active GLP-1 and GIP. Interestingly, a biphasic insulin response was only observed in South Asian males. We speculate that these effects result from biphasic gastric emptying in South Asians, while the precise contribution of these effects to the disadvantageous metabolic phenotype of South Asians remains to be determined.

PO1.138

Transforming big omics data into innovative treatment for metabolic dysfunction-associated steatohepatitis

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Introduction: Frequently found in people living with obesity, metabolic dysfunction-associated steatohepatitis (MASH) becomes a major health concern worldwide. As a "silent" liver disease, MASH is the leading cause of liver failure and the primary indication for liver transplantation. Despite its substantial economic burden on healthcare, there is extreme limited pharmacotherapy for the disease.
Methods: Responding to this challenge, we pioneered a new computational approach, the Sum Of Deviations From Inverse Universal Mapping (SODIUM) model, harnessing 'omics' data to find new indications for existing therapies to treat complex diseases.
Results: Using 60,668 messenger RNA expression profiles of 764 liver biopsies, we identified a unique MASH disease signature including 187 genes and validated its performance in two independent cohorts, achieving an AUC of 0.878. Integrating the disease signature with 168,816 drug profiles, the SODIUM model identified a few potentially therapeutic drugs: three of the top ten hits are already under evaluation in Phase 2-4 clinical trials for MASH. Two other top-ten candidates showed striking efficacy in treating MASH in both in vitro and in vivo models. Our subsequent analysis employed bulk and single cell RNA-Seq techniques to compare hepatocellular heterogeneity between disease and treatment states, elucidating the intricate molecular landscape underlying the influence of these drugs on key pathological processes in MASH.
Conclusion: In conclusion, we established two promising therapeutic candidates for MASH through a data-driven drug repurposing strategy. These findings not only advance the landscape for MASH treatment but also exemplify the power of signature-based drug repositioning in translational medicine.

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PO1.139

Unveiling the Links: How PM Exposure, MicroRNAs, and Extracellular Vesicles Interact to Influence Cardiovascular Risk in Obesity

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Atmospheric particulate matter (PM) exposure is associated with an increased risk of cardiovascular disease and alterations in blood coagulation, with obesity appearing to exacerbate these effects. To elucidate the molecular mechanisms underlying these relationships, we performed various studies and we have investigated the role of microRNAs (miRNAs) and extracellular vesicles (EVs).

These studies involved individuals with overweight and obesity recruited from the Obesity and Work Center in Milan, as part of the SPHERE project.

Participants were assessed for exposure to PM10 (particulate matter with an aerodynamic diameter less than 10 μm), and miRNA expression in blood was analyzed. A two-phase methodology was employed: a discovery phase to identify miRNAs altered by PM10 exposure, followed by a validation phase to confirm the findings.

Results: PM10 levels were linked to changes in the expression of specific miRNAs that appear to influence blood pressure.

Moreover, exposure to PM10 was shown to induce the release of EVs, which contain miRNAs that may affect blood coagulation. Bioinformatics analysis suggested that these altered miRNAs could be involved in the mechanisms connecting PM exposure to increased coagulation and the development of cardiovascular diseases.

Additionally, the assessment of high-density lipoprotein (HDL) functionality revealed a compromise in their protective capacity, particularly in with obesity, with a loss of the compensatory response to PM exposure.

Lastly, PM exposure was also associated with changes in circadian clock gene expression and the formation of DNA adducts.

Conclusions: These results underscore the complexity of interactions between air pollution and overweight or obesity, suggesting that EVs and miRNAs may represent targets for future therapeutic interventions.

PO1.140

Host-microbiota co-metabolism involves in the early stages of obesity development

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Introduction: Obesity is included in a cluster of cardiometabolic risk factors such as hypertension, dyslipidemia, type 2 diabetes, and cardiovascular disease. It is considered a comorbidities-related disease, so these cardiometabolic risk factors can coexist simultaneously in the individual increasing the risk of developing the disorders associated with high risk of mortality in the world. This pattern disorder involves host-microbiota co-metabolism and it is often exacerbated by Western diets with high-fat content. The study of the metabolism involved and the development of specific biomarkers for the early detection of these patterns of diseases could be essential in patient management.

The objective of this study is to identify potential subclinical early biomarkers through the analysis of metabolic changes in obesity development by NMR-metabolomics and gut-microbiota modulation.

Methods: In this study 32 male and female Wistar rats, 16 weeks old, were fed with a high fat and sucrose diet for 12 weeks to induce metabolic disorders, randomly divided into four study groups based on diet and sex. The pathophysiological characterization of the disease in these animals was measured by the analysis of blood pressure, body weight and blood glucose. Moreover, the biochemical levels of insulin, cholesterol and triglycerides in serum samples were analyzed. Microbiota analysis was performed by Sequencing to identify the host microbiota communities involved. Furthermore, 1H-NMR was used to determine the metabolomic profiling in blood and fecal samples. Statistical analysis was performed using SPSS and Matlab.

Results: The experimental design, featuring the longitudinal evaluation of an animal model, could enable us to observe the variations in microbiota and metabolism over time. The alterations include an increase in body weight, arterial blood pressure and glycaemia, showing the development of early stages of obesity and related metabolic diseases in adult male and female rats. In addition, biochemical parameters such as cholesterol were altered in males, instead, female rats do not show high evidence of biochemical alterations. The characterization of the gut microbiota from fecal samples indicated that a high-fat diet produced an increase in Firmicutes and a decrease in Bacteroidetes. The metabolomic profile showed metabolism differences in the high-fat diet group, that affected metabolites involved in different metabolic pathways including host microbiota co-metabolites.

Conclusion: This study has identified that gut-microbiota co-metabolism appears to modulate the early development of obesity in the host organism and that NMR-based metabolomics can provide a non-invasive approach to the early detection of these alterations.

PO1.141

Secreted factors from obesity-associated visceral adipose tissue drive methylome alterations in breast cancer cell lines promoting cellular proliferation

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Introduction: Excess body fat is one of the most significant risk factors for breast cancer. This connection may be influenced by a distinctive methylation pattern potentially driven by factors secreted from obesity-related adipose tissue. Epigenetic mechanisms play a crucial role in the development of breast cancer. Understanding how adiposity affects the epigenetic regulation of breast cancer could provide deeper insights into the link between obesity and breast cancer. This study aimed to investigate the in vitro impact of secreted factors from obesity-associated visceral adipose tissue (OBVAT) on the methylation profile of breast cancer cell lines.

Methods: The human breast cancer cell lines MCF7 were exposed to human OBVAT secretomes (OBVATS) from patients with severe obesity at 5% (v/v) for 72 hours in vitro, with renewal of the treated culture medium every 24 hours. The secretome was obtained from samples extracted at the time of undergoing bariatric surgery for weight loss. The treatments were prepared from the pool of samples from three different patients. Genome-wide DNA methylation assessment was performed using the Infinium MethylationEPIC BeadChip platform (Illumina). Proliferation of MCF7 cells was estimated using the Cell Proliferation Reagent WST1 (Roche) in 5x103 cells seeded into a 96-well plate. The treatments were performed in at least three independent experiments and normalized against the control.

Results: Exposure to OBVATS resulted in a statistically significant increase in the proliferation of MCF7 cells. Analysis of global DNA methylation profiles revealed distinct differences between OBVATS-treated and control cells. The treated cells exhibited a more hypomethylated

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profile compared to the untreated line. Notably, differential DNA methylation at CpG islands was observed in genes involved in key cellular processes associated with tumor progression, such as cadherin and Wnt signaling pathways, as well as genes linked to cellular structures, including the mitochondria and extracellular matrix. Several epigenetically deregulated genes were identified in response to OBVATS exposure. Among these, OTUD5 stood out, displaying nine differentially methylated CpG sites (DMCpGs) located in the CpG island and promoter region with methylation differences exceeding 10%.
Conclusion: The results indicate that OBVATS exposure promotes cellular proliferation in breast cancer cells and induces widespread changes in their methylation profiles, favoring a hypomethylated state. These epigenetic alterations affect genes involved in tumor-related signaling pathways and structural cellular components, potentially contributing to tumor progression. The identification of OTUD5 as a highly deregulated gene highlights its potential role in the epigenetic regulation of tumor development in response to obesity-associated factors, offering a promising avenue for further research.

PO1.143

Reduction of heparanase concentration in myocardial tissue in an animal model of obesity after treatment with dapagliflozin: a new hypothesis for explaining the cardioprotection of SGLT2 inhibitors

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Introduction: Despite their undoubted efficacy in treating heart failure (HF), the mechanisms by which the sodium-glucose cotransporter-2 inhibitors (SGLT2i) act still remain not fully understood. Heparanase (HPSE) is an enzyme involved in extracellular matrix deposition and fibrosis, and its inhibition has been considered an emerging treatment for diabetic kidney disease and liver cirrhosis. In addition, HPSE has been recently demonstrated to be involved in diabetic cardiomyopathy. Since myocardial fibrosis plays a role in the development of HF, in particular in the obesity-related HF phenotype, the potential anti-fibrotic effects of SGLT2 inhibitors through the possible effects on cardiac HPSE have been investigated
Methods: We compared the expression of HPSE in 5 C57BL/6J wild-type mice and 6 B6.V-LEP ob/ob mice (Charles River Laboratories, Massachusetts, USA), and 9 B6.V-LEP ob/ob mice treated with dapagliflozin (0.15 mg/kg/day). Tissue analyses were performed after 4 weeks.
Results: we found a higher myocardial HPSE protein concentration in ob/ob animals (p=0.03). HPSE gene expression was not significantly different between WT and ob/ob mice, but dapagliflozin treatment reduced HPSE expression in ob/ob treated compared to ob/ob non-treated mice (p=0.01). Also, protein concentration was reduced after dapagliflozin administration (p=0.004). Treatment with the SGLT2i did not affect the expression of markers of fibrosis such as TGF-β, TNF-α, and α-SMA in myocardial tissue, with the exception of TGF-β which was reduced (p=0.01).
Conclusions: myocardial HPSE is higher in obesity, but dapagliflozin treatment reduces both gene expression and protein concentration to levels comparable to the healthy counterpart. Considering the suggested role of HPSE in cardiometabolic disease, these results propose a new mechanism for explaining SGLT2i cardioprotection. This data merits further investigation due to the additional clinical burden represented by HF in patients with concomitant obesity.

PO1.144

The prognostic role of sex in non-alcoholic fatty liver disease (NAFLD)

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Introduction: The global epidemic of non-alcoholic fatty liver disease (NAFLD) represents a significant public health issue with substantial healthcare implications. NAFLD has become the fastest-growing cause of orthotopic liver transplantation, driven by cases of end-stage liver disease (ESLD) and hepatocellular carcinoma (HCC).The variability in risk factors and treatment responses among individuals with NAFLD complicates the identification of those at high risk, as well as the development of tailored preventive and therapeutic strategies, hindering efforts to slow this escalating health crisis. The exploration of sex differences has emerged as an increasingly important focus in modern medicine.
Methods: A retrospective analysis was conducted using publicly available data from the "Non-alcohol Fatty Liver Disease" dataset on Kaggle. The dataset comprised 17,549 patients diagnosed with NAFLD. Survival outcomes were analyzed using Kaplan-Meier curves and Cox proportional hazards regression. Survival time was defined as the duration (in months) from diagnosis to death or the last follow-up. The primary outcome was overall survival, stratified by sex. The explanatory variables included sex (male = 1, female = 0) and other clinical covariates such as BMI and age.
Results: Kaplan-Meier analysis revealed a high overall survival rate at 5 years (>99%) for both sexes. However, males demonstrated a slightly lower survival probability compared to females. Cox proportional hazards regression indicated that being male was associated with a 20% higher risk of mortality (HR = 1.20, 95% CI: 1.08–1.33, p = 0.001). The likelihood ratio test confirmed the significance of sex as a predictor of survival in this population (p = 0.001). Further stratification by BMI categories revealed no unexpected associations.
Conclusion: In patients with NAFLD, male sex is associated with a higher risk of mortality compared to females, underscoring the potential influence of sex-related factors on disease progression and outcomes. These findings, derived from a publicly available dataset, emphasize the importance of full exploration of sex differences in NAFLD. Major research gap which must be addressed at all levels from basic science to clinical trials

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PO1.145

Role of Obesity in Protection Against Advanced Chronic Kidney Disease

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Introduction: Obesity, defined by a BMI ≥30 kg/m², is associated with chronic kidney disease (CKD) and the "obesity paradox" in advanced stages. However, evidence is insufficient and lacks key variables, such as muscle strength, a relevant functional and nutritional indicator. This study aims to explore these variables to provide greater clarity.
Method: A cross-sectional study was conducted on 18 CKD patients treated at a public hospital in Mexico, distributed between predialysis (10) and dialysis treatment (8). The objective was to analyze the relationship between BMI, body fat percentage, and dominant hand muscle strength. Variable normality was assessed (Shapiro-Wilk test), groups were

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compared using the Student's t-test, and correlations were explored using Pearson's coefficient. Measurements included BMI, body fat percentage via bioimpedance, and muscle strength using a dynamometer.
Results: Hemodialysis and Peritoneal Dialysis:
Patients with higher BMI showed an average muscle strength of 32.45 ± 5.23 kg compared to those with lower BMI (21.93 ± 4.78 kg). Similarly, those with a higher fat percentage had an average muscle strength of 31.7 ± 5.86 kg compared to patients with a lower fat percentage (22.68 ± 4.92 kg).
Predialysis: In this stage, patients with a higher fat percentage showed greater average muscle strength with lower variability (25.4 ± 6.1 kg), while those with a lower fat percentage exhibited lower average muscle strength and higher variability (18.7 ± 7.4 kg). The correlation between fat percentage and muscle strength was positive but moderate (0.40).
Conclusion: The study supports the obesity paradox, suggesting that a higher BMI and fat percentage may be associated with better muscle strength in patients with advanced CKD. These findings highlight the importance of including body composition and muscle strength as indicators in clinical management, beyond BMI.

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PO1.146

Targeting ceramide-induced lipotoxicity in obesity-associated metabolic dysfunction: therapeutic potential of AdipoR agonists

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Background: Obesity is a multifaceted condition characterized by excessive lipid accumulation and metabolic dysregulation. Among the lipotoxic species, ceramides are strongly implicated in organ dysfunction, particularly in the heart and liver. Elevated ceramide levels are associated with heart failure with preserved ejection fraction (HFpEF) and Metabolic dysfunction-associated steatotic liver disease (MASLD). Mechanistically, ceramides disrupt cellular processes by inducing apoptosis, inflammation, and insulin resistance, contributing to the progression of metabolic diseases. Reducing ceramide content in tissues is therefore a promising therapeutic strategy. Novel approaches targeting ceramide metabolism, such as the activation of adiponectin receptors (AdipoR) with specific agonists, have shown potential in mitigating lipotoxicity and improving cellular resilience.
Objective: This study aims to explore the therapeutic potential of AdipoR agonists in reducing ceramide-induced lipotoxicity, exploiting their role as ceramidases. We hypothesize that activation of AdipoR may enhance ceramide degradation, thus improving mitochondrial function and reducing cellular death. In vitro models of lipotoxicity were employed to evaluate the efficacy of this intervention in both cardiomyocytes and hepatocytes.
Methods: Lipotoxicity was induced in AC-16 and HepG2 cells through treatment with 300μM palmitate (or 300μM BSA used as negative control). Cells were then treated with or without 100μM JT003, a potent AdipoR receptor agonist, and ceramide content was quantified using anti-ceramide antibodies for immunofluorescent staining before and after treatment. Cellular viability was assessed using MTT assays to measure the protective effects of JT003 against lipid-induced cytotoxicity. Preliminary experiments also explored the modulation of key pathways involved in ceramide metabolism.
Results: Immunofluorescence analysis revealed an increased ceramide accumulation after palmitate treatment and a marked reduction in intracellular ceramide levels following treatment with JT003. This reduction was observed consistently across both cell types. MTT assays indicated significantly enhanced cell viability post-treatment, suggesting that JT003 effectively mitigates ceramide-induced cytotoxicity. These findings suggest that activation of AdipoR by JT003 promotes ceramide degradation, thereby reducing lipotoxic stress.
Conclusions: Our findings provide preliminary evidence supporting the therapeutic potential of AdipoR agonists in addressing ceramide-mediated lipotoxicity, a key driver of organ dysfunction in metabolic syndrome and obesity. By targeting ceramide accumulation, AdipoR agonists may serve as effective interventions for conditions such as HFpEF and MASLD. These results pave the way for future studies aiming at elucidating the molecular mechanisms underlying these effects and validating the clinical applicability of AdipoR agonists in metabolic disease management.

PO1.147

Role of Microglia-Derived Progranulin in the Development of Diet-Induced Obesity

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Hypothalamic innate immune responses to dietary fats underpin the pathogenesis of obesity, in which microglia play a critical role. Progranulin (PGRN) is an evolutionarily -conserved secretory protein containing seven-and-a-half granulin (GRN) motifs. It is cleaved into GRNs by multiple proteases. In the central nervous system, PGRN is highly expressed in microglia. To investigate the role of microglia-derived PGRN in metabolism regulation, we established a mouse model with a microglia-specific deletion of the Grn gene, that encodes PGRN. Mice with microglia-specific Grn depletion displayed diet-dependent metabolic phenotypes. Under normal diet-fed conditions, microglial Grn depletion produced adverse outcomes like fasting hyperglycemia and aberrant activation of hypothalamic microglia. However, when fed a high fat diet (HFD), these mice exhibited beneficial effects, including less obesity, glucose dysregulation, and hypothalamic inflammation. These differing phenotypes appear linked to increased extracellular cleavage of anti-inflammatory PGRN into proinflammatory GRNs in the hypothalamus during overnutrition. In support of this, inhibiting PGRN cleavage attenuated HFD-induced hypothalamic inflammation and obesity progression. Our results suggest that the extracellular cleavage of microglia-derived PGRN plays a significant role in promoting hypothalamic inflammation and obesity during periods of overnutrition. Therefore, therapies that inhibit PGRN cleavage may be beneficial for combating diet-induced obesity.

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PO1.148

Obesity related metabolic profile in women with polycystic ovary syndrome durig reproductive age

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Objective: The prevalence of metabolic disorders, obesity, and insulin resistance in women with polycystic ovary syndrome are present starting early in life and places this group at risk of metabolic disturbances and cardiovascular disease. Obesity as an independent risk factor has an effect on promoting metabolic alteration in this particular group of women. This study was designed to evaluate whether adipose tissue hormons such as adiponectin, leptin and resistin are corelated with antropometric parameters such as BMI, waist-to-hip ratio (WHR), insulin resistance, or metabolic changes usually present in women suffering from PCOS are different in the group of participants with obesity versus PCOS women without obesity.
Methods: A cross sectional study was conducted at the University clinic of Gynecology and obstetrics, Skopje, Macedonia. This study was conducted on 89 women with PCOS 18–35 years and 66 healthy age and BMI matched controls were selected from family and friends of the cases. Demographic details, family history and past medical history were obtained through interview by a physician. Anthropometric measurements included weight and height of the participant. The serum concentration of adipose tissue-derived hormones was evaluated in 89 PCOS women and 60 healthy women, together with clinical, and hormonal parameters. The mean of BMI, waist circumference, WHR, and mean concentration of the luteinizing hormone, testosterone, androstenedione, free androgen index, fasting insulin, and HOMA- index, are significantly higher in PCOS women compared to age-matched healthy women. There was a positive correlation between BMI, WC, insulin, and triglycerides ($p<0.001$) and a significant negative correlation with LH, SHGB, HOMA-IR, HDL, and adiponectin ($p<0.001$). Statistical analysis showed a significant difference between the participants with obesity for all investigated anthropometric parameters, except for the age as well as CRP values. Average adiponectin level was 9,88±4,4 and correlated both negatively and significantly with the waist circumference, and BMI ($p<0.001$). The major characteristic of our results observed significant differences between lean and overweight participants in almost all important features. **Conclusion:** PCOS is, therefore, a multiple diseases, raising awareness of risk factors among the high-risk population and implementing targeted screening to identify high-risk individuals for developing metabolic complications, along with appropriate interventions to combat these parameters before the onset of the disease would go a long way mitigating the devastating complications of the disease.

PO1.149

Genetic Variants Associated with Myocardial Infarction in Non-Alcoholic Fatty Liver Disease

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Background: In recent studies, non-alcoholic fatty liver disease(NAFLD) has been associated with a high risk of ischemic heart disease. This study aimed to investigate a genetic variant within a specific gene associated with myocardial infarction(MI) among patients with NAFLD.
Methods: We included 57,205 participants from a Korean genome and epidemiology study. The baseline population consisted of 45,400 individuals, with 11,805 identified as patients with NAFLD. Genome-wide association studies were conducted for three groups: the entire sample, the healthy population, and patients with NAFLD. We defined the "p-value" $< 1\times10^{-5}$ as the nominal significance and the "p-value" $< 5\times10^{-2}$ as statistically significant for the gene-by-nutrient interaction. Among the significant single-nucleotide polymorphisms(SNPs), the lead SNP of each locus was further analyzed.
Results: In this cross-sectional study, a total of 1529 participants (2.8%) had experienced MI. Multivariable logistic regression was performed to evaluate the association of 102 SNPs across nine loci. Nine SNPs (rs11891202, rs2278549, rs13146480, rs17293047, rs184257317, rs183081683, rs1887427, rs146939423, and rs76662689) demonstrated an

Tab. 1. Significant SNPs of MI case-control GWASs in the association cluster locus.

SNP	CHR	BP	Feature	Gene	ALT	REF	1KG Phase1 ALT freq.			A1	Myocardial Infraction History (MI)					
							EAS	EUR	AMR		Total		w NAFLD		Control	
											OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
rs11891202	2	232276827	intergenic_region	B3GNT7-NCL	T	C	0.197	0.144	0.114	T	1.15 (1.06–1.26)	1.49×10^{-3}	1.44 (1.23–1.68)	4.95×10^{-6}	1.05 (0.94–1.16)	3.94×10^{-1}
rs2278549	3	81144666	non_coding_transcript_exon_variant	LOC728290	G	T	0.396	0.100	0.138	G	0.93 (0.86–1.01)	6.56×10^{-2}	0.70 (0.61–0.82)	5.74×10^{-6}	1.04 (0.95–1.14)	4.43×10^{-1}
rs13146480	4	7483798	intron_variant	SORCS2	C	T	0.044	0.577	0.484	T	1.24 (1.05–1.47)	1.11×10^{-2}	1.97 (1.52–2.56)	2.55×10^{-7}	0.94 (0.76–1.18)	6.01×10^{-1}
rs17293047	4	94588105	intron_variant	GRID2	A	G	0.073	0.128	0.068	A	1.37 (1.11–1.68)	2.72×10^{-3}	2.20 (1.60–3.01)	9.30×10^{-7}	1.03 (0.78–1.36)	8.24×10^{-1}
rs184257317	5	157464382	intergenic_region	CLINT1-LOC101927697	T	C	0.051	0.000	0.027	T	1.31 (1.09–1.59)	4.92×10^{-3}	2.04 (1.51–2.77)	3.93×10^{-6}	1.05 (0.82–1.34)	7.20×10^{-1}
rs183081683	7	120478350	intron_variant	TSPAN12	A	C	0.019	0.000	0.000	A	1.20 (0.97–1.50)	9.39×10^{-2}	2.09 (1.51–2.89)	7.98×10^{-6}	0.86 (0.64–1.16)	3.19×10^{-1}
rs1887427	9	4979730	intergenic_region	RCL1-JAK2	G	A	0.162	0.259	0.193	G	1.13 (1.03–1.24)	1.07×10^{-2}	1.51 (1.28–1.77)	5.83×10^{-7}	0.99 (0.88–1.11)	8.71×10^{-1}
rs146939423	9	86095179	intron_variant	FRMD3	G	A	0.039	0.000	0.000	G	1.24 (1.01–1.52)	4.19×10^{-2}	2.09 (1.53–2.86)	4.20×10^{-6}	0.92 (0.70–1.21)	5.64×10^{-1}
rs76662689	18	12079732	intergenic_region	IMPA2-ANKRD62	A	G	0.034	0.000	0.001	A	1.42 (1.11–1.81)	5.34×10^{-3}	2.48 (1.68–3.67)	5.35×10^{-6}	1.08 (0.78–1.49)	6.52×10^{-1}

We selected a cluster pick region to represent the more reliable association and summarized the top SNPs. The first column outlines the top significant SNPs among the associated loci, Nutrients 2024, 16, 602 6 of 12 and the final column shows cluster pick loci that have at least three SNPs associated with MI with a p-value < 1 × 10−5. Nine SNPs (rs11891202, rs2278549, rs13146480, rs17293047, rs184257317, rs183081683, rs1887427, rs146939423, and rs76662689) were associated with MI only in the group with NAFLD. In detail, eight SNPs (rs11891202, rs13146480, rs17293047, rsrs184257317, rs183081683, rs998538, rs146939423, and rs76662689) were positively asso ciated with MI in the group with NAFLD. On the other hand, s2278549 was inversely associated with MI in the group with NAFLD.

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association with MI in the group with NAFLD Notably, the MI-associated SNP, rs134146480, located within the SORCS2 gene, known for its role in secreting insulin in islet cells, showed the most significant association with MI ("p-value" = 2.55×10^{-7}).

Conclusion: Our study identifies candidate genetic polymorphisms associated with NAFLD-related MI. These findings may serve as valuable indicators for estimating MI risk and for conducting future investigations into the underlying mechanisms of NAFLD-related MI.

PO1.150

Genetic variants associated with changes in liver fat in response to a 3-week sugar-sweetened beverage intervention: A pilot study

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Introduction: Previous studies show that increased consumption of sugar sweetened beverage (SSB) is linked to increased risk for non-alcoholic fatty liver disease (NAFLD), which is characterized by excess fat accumulation in liver cells (hepatocytes). It is also reported that genetic variants can influence the fat build up in hepatocytes. We conducted a clinical trial (NCT03783195) to determine if single nucleotide polymorphisms (SNPs), previously linked to liver fat, are associated with changes in liver fat in response to a 3-week SSB intervention in young adults and adolescents of Caucasian descent. We hypothesized that liver fat, as measured by CAP score, would increase with SSB intervention and liver fat-linked SNPs might influence this change.

Methods: Fifteen participants (Males- 5, Females – 10, mean age 25.5 ± 9 yrs) consumed a beverage consisting of fructose and glucose equivalent to 0.8g/kg and 0.45 g/kg of bodyweight, respectively,(equivalent to two 12 fl oz soda cans) dissolved in 24 fl oz of water per day for 3 weeks. Anthropometrics and blood pressure measurements were taken at baseline and at the end of 3 weeks. Liver fat and stiffness were measured by transient elastography (Fibroscan) through controlled attenuation parameter (CAP) score at both timepoints. Ten SNPs, rs121137855 of LYPLAL1, rs1227756 of COL13A1, rs738409 of PNPLA3, rs887304 of EFCAB4B, rs1260326 of GCKR, rs2854116, of APOC3 rs2645424 of FDFT1, rs58542926 of TMS6F2, rs2228603 of NCAN and rs4240624 of PPP1R3B were genotyped.

Results: At baseline, the mean CAP score was 212.5 ± 10.1 (dB/m) and was not significantly different between genders.

Significant differences were observed with respect to fat mass (50 ±6 vs 31±8.3g, $p < 0.05$), and percent body fat (31.5 ± 2.2 vs, 17.1 ± 3.3%, $p < 0.05$) between females and males, respectively. At baseline, CAP was significantly associated with fat mass

($\beta = 1.2 \pm 0.5$, $p < 0.05$), waist circumference ($\beta = 2.3 \pm 0.9$, $p < 0.05$), and systolic blood pressure ($\beta = 1.6 \pm 0.4$, $p < 0.005$).

Genotype-specific analysis showed that rs1227756 ($\beta = -22.4 \pm 7.5$, $p < 0.05$) was associated with baseline CAP score, with individuals carrying AA alleles having significantly higher CAP score (234 ± 34.7 dB/m) as compared to those with GG alleles (188 ± 25.3 dB/m). Change in CAP score after the 3-week intervention was significantly associated with rs1227756 ($\beta = 152 \pm 32.5$ $p < 0.05$). The A allele (AA/AG) carriers (Mean ± SE -28. 4 ± 38 dB/m) showed a reduction in CAP whereas no change was observed in GG carriers (Mean ± SE 3.4 ± 26 dB/m). rs1227756 is an intronic variant in COL13A1 which codes for the alpha chain of one of the nonfibrillar collagens and whose function is yet unknown.

Conclusion: Body composition, systolic blood pressure and genetic variants were associated with baseline CAP score.

Contrary to our hypothesis, CAP score decreased post SSB intervention. However, the change in CAP score showed difference in direction based on participants' genotypic profile. This pilot study shows the potential role of SNPs in liver fat changes, measured by CAP score that warrants a detailed investigation in a larger sample for a longer duration.

Tuesday, 13 May 2025

PO2 - BEHAVIOURAL SCIENCE and PUBLIC HEALTH

PO2.001

Clinical and humanistic burden of obstructive sleep apnoea in people living with obesity: a multinational survey

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Introduction: Obesity is associated with several complications, including obstructive sleep apnoea (OSA), which impacts health-related quality of life (HRQoL).

There is limited data on the clinical presentation of OSA among people living with obesity (PwO) and their perspective of how OSA impacts their work and HRQoL.

This analysis aims to describe the characteristics, related comorbid burden, work productivity impact and HRQoL in PwO with and without OSA.

Methods: Data were drawn from the Adelphi Real World Obesity Disease Specific Programme™, a real-world, cross-sectional survey of physicians and their consulting adult PwO with previous or current BMI≥30 kg/m2 (China ≥28, Japan ≥25). The study was conducted in Brazil, Canada, China, Japan, Kingdom of Saudi Arabia, United Arab Emirates between Apr-Dec 2022 and France, Germany, Italy, Spain, United Kingdom, United States of America, Australia between Oct 2023-Apr 2024. Physicians reported demographics and clinical characteristics for 3-8 consecutive qualifying PwO. These same PwO completed a voluntary questionnaire including the Work Productivity and Activity Impairment (WPAI, range 0-100%, higher scores indicating greater impairment), the Short Form 36v2 Health Survey (SF-36v2; scores <47 indicate impaired functioning in HRQoL), and the Jenkins Sleep Evaluation Questionnaire (JSEQ; range 0-20 [no to most sleep problems]). Presence of OSA was physician-defined selecting 'sleep apnea' as comorbidity at data collection.

Analyses were descriptive, but appropriate regression analyses were used to investigate associations between study groups and burden of CV comorbidity, HRQoL, work productivity, and sleep impact (p value <0.05 was statistically significant).

Results: Overall, 1,120 physicians provided data on 6,599 PwO (547 with OSA; 6,052 without OSA) (Table 1), of whom 2,507 PwO (159 with OSA; 2,348 without OSA) self-reported data (Table 2). Numerically, at data collection PwO with OSA were older, had higher mean (standard deviation [SD]) BMI, and more comorbidities. Regression analyses showed that PwO with OSA had a higher CV-risk and higher CV established comorbidities, than PwO without OSA (mean [SD] 1.2 [0.1] vs 0.8 [0.0], p-value <0.0001).

For WPAI, PwO with OSA exhibited greater impairment than PwO without OSA.

For SF36v2, numerically PwO with OSA showed greater impairment vs PwO without OSA across all health domains, excluding vitality. Significant differences were observed between groups for physical functioning, role limitations due to physical problems, bodily pain, general health, and physical component summary (p-value <0.05).

PwO with OSA had a greater mean (SD) JSEQ score than PwO without OSA (7.4 [4.9] vs 5.2 [4.4]; p-value <0.0001).

Conclusions: The results suggest that PwO with OSA were more likely to be considered at high or very high risk of CV event, had a greater number of CV comorbidities, suggesting a need for CV assessment in PwO with OSA. PwO with OSA had greater HRQoL, work productivity, and sleep impairment when compared to PwO without OSA. Appropriate screening and diagnosis of OSA and associated comorbidities in PwO is imperative for improved management.

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Tab. 1. Demographics and clinical characteristics of the people living with obesity as reported by physicians.

Characteristics at data collection	PwO with OSA [N=547][a]	PwO without OSA [N=6,052][a]
Age (years), mean (SD)	50.2 (13.9)	46.1 (13.8)
Female, n (%)	222 (41.0)	[n=6,051] 3,609 (60.0)
BMI (kg/m²)	[n=544]	[n=6,035]
Mean (SD)	37.8 (8.2)	34.6 (7.4)
≥30, n (%)	503 (92.0)	4,755 (79.0)
Number of comorbidities, mean (SD)	3.8 (2.7)	2.0 (1.8)
Number of CV comorbidities, mean (SD)	1.3 (1.2)	0.7 (0.9)
Comorbidities, n (%)		
Hypertension	296 (54.0)	2021 (33.0)
Dyslipidaemia	242 (44.0)	1767 (29.0)
Type 2 diabetes	160 (29.0)	1195 (20.0)
Atrial fibrillation	30 (5.0)	76 (1.0)
Comorbidities present (yes) in categories, n (%)		
Cardiovascular	384 (70.0)	2920 (48.0)
Endocrine-renal-metabolic	372 (68.0)	2945 (49.0)
Physician-perceived CV event risk, n (%)		
High	202 (37.0)	1254 (21.0)
Very high	67 (12.0)	262 (4.0)
Most common medications for comorbidities, n (%)		[n=4,890]
Statin	269 (49.0)	1891 (39.0)
Metformin	176 (32.0)	1248 (26.0)
Angiotensin-II receptor inhibitors	194 (35.0)	1091 (22.0)

Abbreviations: CV, cardiovascular; n, number of participants answering that question; N, total number of participants; OSA, obstructive sleep apnoea; PwO, people living with obesity; SD, standard deviation. a There was no imputation of missing data, and therefore, sample size may vary between variables.

Tab. 2. Self-reported perspectives of the people living with obesity.

Characteristics at data collection	PwO with OSA [N= 159][a]	PwO without OSA [N= 2,348][a]
WPAI questionnaire[b], mean (SD)		
Activity impairment due to obesity	37.9 (26.8) [n=152]	33.9 (25.6) [n=2,278]
Overall work impairment due to obesity	31.3 (25.9) [n=81]	28.3 (25.2) [n=1,366]
Impairment while working due to obesity	30.1 (23.7) [n=85]	26.6 (23.6) [n=1,511]
Work time missed due to obesity	5.7 (15.4) [n=88]	4.2 (11.6) [n=1,389]
SF36v2[c], mean (SD)		
	[n=159]	
Physical functioning	43.1 (9.8)	46.7 (9.0) [n=2,344]
General health	41.0 (10.5)	43.1 (10.8) [n=2,348]
	[n=158]	
Role limitations due to physical problems	44.7 (9.6)	47.3 (8.6) [n=2,336]
Bodily pain	45.7 (10.6)	49.4 (10.2) [n=2,341]
Vitality	47.2 (9.9)	49.5 (9.5) [n=2,338]
Social functioning	43.6 (10.0)	45.0 (9.6) [n=2,346]
Mental health	44.1 (11.1)	45.3 (9.7) [n=2,339]
Physical component summary	43.9 (8.9)	47.7 (8.4) [n=2,326]
Mental component summary	45.1 (10.6)	45.6 (9.7) [n=2,328]
Role limitations due to emotional problems	44.3 (10.6) [n=157]	45.7 (9.8) [n=2,334]
JSEQ[d], mean (SD)	[n=150] 7.4 (4.9)	[n=2,279] 5.2 (4.4)

Abbreviations: JSEQ, Jenkin Sleep Evaluation Questionnaire; n, number of participants answering that question; N, total number of participants; OSA, obstructive sleep apnoea; PwO, people living with obesity; SD, standard deviation; SF36v2, Short Form (36) Health Survey; WPAI, Work Productivity and Activity Impairment. a There was no imputation of missing data, and therefore, sample size vary between variables. b Range 0-100%; higher scores indicate greater impairment and less productivity, c Value <47 means impaired functioning d Range 0 [no sleep problems] - 20 [most sleep problems]; value >11 means high sleep disturbance

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PO2.002

Competing Priorities: Stakeholders' Perspectives Towards Obesity prevention in Lebanon

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Introduction: In Lebanon, the population is experiencing a nutrition transition and a high prevalence of obesity. To achieve a population behaviour change and to address the obesity epidemic, a multi-sectoral approach is needed. This approach requires joint efforts from different sectors, such as the government, healthcare, and civil society, to develop action plans and policies. This study explored key stakeholders' perspectives on obesity in Lebanon, focusing on perceived causes, priority levels for action, existing efforts, needed actions, and barriers to effective action.
Methods: Part of a larger Qualitative study the findings here related to interviews conducted with twenty-four stakeholders from government, civil society, academia, non-governmental organisations, professional associations, healthcare, and municipalities. Purposive and snowball sampling was used for recruitment; data was collected using semi-structured face-to-face interviews and analysed using thematic analysis.
Results: Six themes emerged: nutrition transition and westernisation, lack of supportive environments versus individual responsibility, Piecemeal and ad hoc action, calls for action, the healthcare system and political barriers. Stakeholders identified obesity as a growing concern linked to dietary shifts, physical inactivity, and fast-food proliferation. Despite recognising systemic factors, many emphasised individual responsibility over structural influences. Obesity prevention was a low priority for stakeholders, especially governmental amidst wider socio-political and economic crises. Current efforts were fragmented, including awareness campaigns led by academia, healthcare, and the Ministry of Public Health. Non-health sectors engaged in initiatives promoting healthy lifestyles, but these primarily targeted other social objectives. Barriers included limited resources, weak leadership, and reliance on personal accountability instead of addressing systemic causes. Unclear roles and relevance among different stakeholders hindered cross-sectoral collaboration. Stakeholders called for systemic changes, healthier environments, improved collaboration, and a centralised coordinating body to unify efforts.
Conclusion: Combating obesity in Lebanon demands shifting from individual-focused approaches to systemic public policies addressing the obesogenic environment. Building public and policymaker support is essential to overcome "policy inertia." A systematic action plan, underpinned by a "Health in All Policies" approach and strong government leadership, is crucial to establish national multi-sectoral collaboration.

PO2.003

Demystifying theory-led complex intervention development; targeting sedentary behaviour in obesity

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Introduction: Both sedentary behaviour and obesity are independent risk factors for poor health and quality of life. Minimising sedentary behaviour is an important public health strategy. People with moderate or severe obesity have unique challenges to minimising sedentary behaviour. Interventions are more likely to be effective if they are theory, evidence and person-based. This research describes the development of theory driven content for an intervention which aims to reduce sedentary behaviour during leisure time in the domestic domain among people living with moderate or severe obesity.
Methods: The behaviour change wheel guided the development of the intervention content, while in-depth qualitative data with people living with obesity (n=21) ensured a person-based approach. A detailed behavioural analysis conducted using the Capability, Opportunity and Motivation Behaviour (COM-B) model and Theoretical Domains Framework (TDF) provided the data for selecting appropriate content for the target user group. Content was selected using the Behaviour Change Techniques Taxonomy (BCTTv1), Theory and Techniques Tool, two systematic reviews, and key scientific literature.
Results: Twenty behaviour change techniques with potential to change SB in the domestic domain were identified, which can be delivered remotely via an online intervention. Intervention functions consist of education, persuasion, training and enablement. Strategies and guiding principles are outlined. A SB example for all 93 BCT's in the BCTv1 is provided alongside a longlist of 50 more relevant BCTs to serve as a reference guide for future designers.
Conclusion: A theory, evidence and person-based approach to develop an intervention to reduce sedentary behaviour in the domestic domain for people living with obesity is described. The BCW guide, COM-B model, TDF and BCT-Taxonomy provided the framework for selection of theoretical content. To ensure relevance for the target population, the content and mode of delivery was developed in collaboration with people with moderate to severe obesity using a person based approach.

PO2.004

Behavioral Compensatory Responses to Different Modes of Exercise in individuals with Overweight and Obesity

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Background-Aim: Researchers and clinicians have long sought to combat the obesity pandemic utilizing supervised exercise interventions to induce a sizable energy deficit and promote weight loss. Exercise has also been shown to alleviate metabolic adaption, which can moderate weight loss, due to e.g. maintenance of lean body mass and improved appetite regulation. Despite this some individuals fail to lose weight while some even gain weight, suggesting the existence of strong behavioral compensatory responses that mitigate an energy deficit. The focus so far has largely been on compensatory energy intake (EI) but changes in sedentary behavior (SB) and non-exercise physical activity (NEPA) can be equally influential. Different exercise modalities may evoke varied behavioral responses due to differences in physiological demands. This exploratory analysis investigates how different modes of exercise affect acute behavioral compensatory responses in persons with overweight and obesity, by examining differences in EI, SB and NEPA on the day after a single bout of morning exercise.
Methods: Twenty-four physically inactive individuals (58% female) with mean (SD) age of 54 (8) years and BMI of 32 (4) kg/m2 were included in a 3-arm replicated randomized cross-over pilot study. A single bout of weekly exercise was undertaken in the morning hours for two consecutive weeks in a test-retest design, randomized for three common exercise modalities: 1) moderate-intensity continuous training (MICC, 64-76% of maximal heart rate (HRmax)), 2) high intensity interval training (HIIT, 5x4 min at >85% HRmax) or 3) whole body resistance training (REx, 4 exercises with 3 sets of 10 repetitions at 70% of 1 repetition maximum) matched in duration to equate 50 min. Total daily EI was calculated from a paper-based dietary record filled out the day before, the day of, and the day after each bout of exercise. SB as well as time spent on light (LPA) and moderate-to-vigorous physical activity (MVPA) (in %) were measured using SENS accelerometers (Copenhagen) placed above the knee and worn throughout the trial. Results from the two replicates were averaged and analyzed using two-sided repeated measures ANCOVA with mixed linear modeling.
Results: Exercise modality showed no significant effect on EI (p=0.06), SB (p=0.97), LPA (p=0.11) or MVPA (p=0.49) on the day of exercise. Mean

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[95% confidence interval (CI)] EI equated to 9,053 kJ [7,664;10,694], 7,868 kJ [6,536;9,473], and 8,077 kJ [6,732;9,691] for the MICC, HIIT, and REx exercise bout, respectively. Time spent sedentary from the cessation of exercise until midnight of the same day was 62% [56;70], 62% [56;69], and 63% [57;71] while time spent on LPA was 22% [17;29], 24% [18;31], and 23% [17;30], for the MICC, HIIT, and REx respectively. Time spent on MVPA outside of the exercise bout was <2% across all modalities on the day of exercise.
Conclusion: This exploratory analysis suggests that three commonly employed exercise modalities do not deferentially impact acute compensatory EI, SB, or NEPA responses in individuals with overweight and obesity, indicating that no single modality is superior in this regard.

PO2.005

Leveraging HIIT and Digital Motivation for Exercise Adherence

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Introduction: Despite acknowledging the health benefits of exercise, younger medical professionals often struggle to incorporate it due to time constraints and lack of motivation. This study aimed to address these barriers by promoting high-intensity interval training (HIIT) and leveraging South Korea's Naver Band app for daily motivational support.
Methods: To maximize peer support, nurses from the same ward formed groups within Naver Band, where daily exercise activities were verified through peer validation. Group leaders were appointed to encourage participation, with monthly rankings generated based on verification frequency. This intervention lasted six months, and health metrics such as weight, body fat, CRP, insulin, and PYY levels were measured at the start and end.
Results: The average participant age was 32 years. The total number of bands is 10, with an average of 22 participants in each. Consistency in daily exercise verifications improved from 64% in the first month to 91% by the sixth month. They increasingly encouraged one another within their respective bands. Notably, 22% of participants experienced a weight reduction of over 5%, while 31% reported more than a 5% decrease in body fat. Both fasting blood sugar and insulin levels decreased significantly, and PYY hormone levels increased.
Conclusion: The implementation of a HIIT regimen, coupled with peer verification through a digital platform, significantly enhanced daily exercise rates among healthcare professionals. Improvements in weight, body fat, and metabolic markers were noted, alongside positive participant feedback on the enjoyable nature of the program. This model presents a promising strategy for fostering regular exercise within various communities.

PO2.006

Personalized lifestyle reports and shiny apps to visualize ecological monetary assessment data in participants with overweight or obesity

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Introduction: Smartphone-based ecological monetary assessment (EMA) is a useful tool to capture the daily lifestyle patterns of people with overweight and obesity over a period of time, assessing for example food craving, intake, emotions, physical activity, sleep quality, etc. It is important that the insights from EMA data can be communicated in an easy-to-understand way to participants. In this way, participants can use these insights to inspire healthier choices in their daily lifestyle. Providing these insights tends to be cumbersome, as preprocessing and analyzing EMA data can be difficult. Therefore, automatic ways to preprocess and provide insights from EMA data are warranted.
Methods: An automatic series of scripts was developed using R to preprocess EMA data of the daily lifestyle behaviour) of participants with overweight and obesity. In total, 600 participants with different body weights (i.e., obesity, overweight, and healthy BMI) will be included in the study. A graphical user interface was created within a parameterized R markdown document to generate a PDF with specific graphs the user could choose from a list (e.g., a graph displaying physical activity levels, the social context of participants when eating healthy/unhealthy foods, etc.). A shiny app was also devised for researchers, to create interactive graphs, enabling detailed insight in the timeseries data.
Results: For each participant, a personalized report was created. Importantly, these reports provided us with valuable insights for our project as well, for example highlighting the large interindividual variability in lifestyle behavior within the same bodyweight group, as well as elucidating between-group differences in lifestyle behavior.
Conclusion: Automated tools to preprocess and analyze EMA data are warranted, as more and more researchers use EMA to capture the daily lifestyle behaviour of participants with overweight and obesity. For this study, these tools allowed us to highlight the importance of looking at overweight and obesity through a personalized lens. Overweight and obese are multifactorial conditions and there are large interindividual differences, which warrants the development of personalized software to preprocess and analyze EMA data.

Conflict of Interest: None disclosed.

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PO2.007

A population-level microsimulation model developed to evaluate the health, healthcare cost and productivity impacts of food taxes in the United Kingdom

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Introduction: Food taxes are needed to address imbalances in the price of healthy foods compared with unhealthy foods and to raise revenue that can be used to support urgent public health challenges. This study aims to develop a modelling tool to evaluate the long-term health, healthcare cost, and productivity impacts of alternative food tax designs to inform the implementation of new taxes in the United Kingdom (UK).
Method: A microsimulation model generates a synthetic population aged 5 to 99 with sociodemographic and health characteristics representative of the UK. Health Survey for England data are synthesised with National Diet and Nutrition Survey data to provide detailed individual-level data on food consumption patterns grouped into 50 food types. Price elasticity of demand and substitution effects to other foods, estimated from the Living Costs and Food Survey, were used to simulate changes in food consumption conditional on changes in food prices. The simulation model translates changes in total nutritional intake to metabolic risks using established models. Changes in calories (kcals) translates to changes in weight (kg) using a model developed from trial data, and salt, fat and carbohydrate intake impacts systolic blood pressure, cholesterol and HbA1c informed by results from several meta-analyses describing these associations. Metabolic risks and health outcomes are simulated in annual cycles utilising the School for Public Health Research Diabetes Prevention Model. The risk of dental caries in children and adults is conditional on sugar intake. Metabolic risks predict long-term health events including

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type-2 diabetes, cardiovascular disease, microvascular disease, cancers, osteoarthritis, and dementia. Health events determine mortality, Quality Adjusted Life Year estimates as well as National Health Service costs and social care costs. Health related quality of life determines annual work activity status and social benefit income. The model enables cost-effectiveness analysis with long-term outcomes discounted at 3.5%.

Results: The model simulates long-term health trajectories that have been validated against population-level and disease specific sources of evidence. Reductions in calories consumed is associated with the greatest health impact through weight change, impacting health-related quality of life and health outcomes. Reducing dietary sugars generates important cost-savings from reduced dental caries. The model is sensitive to substitution effects between food types, food groups targeted for price rises, and the magnitude of price rise.

Conclusion: Food taxes targeting calories and sugars have the potential to generate health benefits.

PO2.008

Adherence to the new Nordic Nutrition Recommendations for animal-based foods by weight status in Finnish adults

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Background: The consumption of animal-based foods, especially red and processed meat, has been associated with higher weight status and risk for weight gain. However, less is known about food consumption and adherence to food-based dietary guidelines according to weight status.

Aim: Our aim was to examine differences in the adherence to the food-based dietary guidelines for animal-based food groups in the new Nordic Nutrition Recommendations (NNR) 2023 by weight status categories in Finnish men and women.

Methods: In all, 1655 participants (780 men and 875 women, aged 18–74 years) from the national FinDiet 2017 Survey were included. 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, milk, and fish, and proportion of men and women reaching the NNR guidelines (a maximum of 50 g/day, 350-500 ml/day, and 43-64 g/day, respectively). Body weight and height were measured by trained research staff, and body mass index (BMI) was calculated (kg/m2). BMI was categorized as normal weight (<25 kg/m2), overweight (25.0–29.9 kg/m2), and obesity (≥ 30 kg/m2).

Results: In general, Finnish adults have relatively low adherence to the NNR guidelines for animal-based food groups, and we could not detect difference in adherence between weight status categories. However, in women, higher proportion of participants living with normal weight (32 %) tended to meet the target for red and processed meat (≤ 50 g/day) compared to the women living with obesity (24%). In men, across all weight status categories less than 10% of participants met the target for red and processed meat. Furthermore, about 20% of women and 10% of men across all weight status categories met the daily consumption target for dairy (350-500 ml/day), and 10% of women and 15% of men across all weight status categories met the daily consumption target for fish (43-64 g/day).

Conclusion: Overall, we could not find difference in adherence to the guidelines for animal-based food groups in the NNR 2023 by weight status categories in Finnish men and women. Implementing nutrition recommendations and food-based dietary guidelines is crucial for improving population health despite of the weight status.

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PO2.010

Intersectional inequality in general and central obesity: a cross-sectional UK Biobank study using multilevel analysis of individual heterogeneity and discriminatory accuracy

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Background: Obesity rates are increasing. A risk factor for this is socioeconomic deprivation which can exist at both the individual and neighbourhood level. It is unclear how these interact, both with each other and with sex, ethnicity and age, to explain the variation in obesity. These factors may intersect to produce positive or negative inequality separate to their individual additive effects (e.g. higher income minimising the impact of neighbourhood deprivation through a glass floor effect). This study aims to analyse the intersectional inequality of these variables on obesity and central obesity using the novel multilevel analysis of individual heterogeneity and discriminatory accuracy technique (MAIHDA).

Methods: The sample comprised 453,376 participants from England and Scotland in the UK Biobank study. Individuals were grouped together according to their household income (<£18,000, £18-000 to £30,999, £31,000 to £51,999, ≥52,000), neighbourhood deprivation (Index of Multiple Deprivation), sex (male, female), ethnicity (White, Mixed, Asian, Black), and age (<55 years, ≥55 years). In total, there were 320 intersectional groups or strata. MAIHDA was used to establish the amount of variation in body mass index (BMI), fat mass index (FMI), and waist circumference (and their associated weight categorisations) due to overall inequality and intersectional inequality from these strata, as well as for each individual stratum.

Results: Greater individual and neighbourhood deprivation was associated with obesity, with >£52,000 and high neighbourhood deprivation having odds ratio for increased BMI of 0.97 (95% CI: 0.96, 0.98) and 1.05 (1.04, 1.06) respectively; compared to individuals with <£18,000 and low neighbourhood deprivation respectively. Black ethnicity was associated with 1.06 (1.05, 1.07) times higher odds of obesity, compared to White ethnicity. Between 6.5% (BMI) and 25.2% (FMI) of variation in excess adiposity was due to inequality from our social strata, with between 4.6% (FMI) and 37.8% (BMI) of this variation due to an intersectional effect. High income white and younger Asian women had a positive intersectional effect independent of their neighbourhood deprivation. Whilst low-income black women have a negative intersectional effect, except when in neighbourhoods with low deprivation. Meanwhile low-income black men have a positive intersectional effect when living in areas of high deprivation. However, high income white men living in areas with lower deprivation have a negative intersectional effect.

Conclusion: There is a small to fairly large inequality effect on obesity, with up to 37.78% of this effect being intersectional in nature. This demonstrates how considering only additive effects when analysing the inequality of obesity may underestimate the unique impact for individual social strata.

Conflicts of interest: None disclosed

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PO2.011

Prevalence, trends and characteristics of obesity in Hungary's Comprehensive Health Screening and Prevention Program between 2010-2023

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Introduction: Hungary's Comprehensive Health Screening Program for cardiovascular prevention was established in 2010. In addition to the health status of the Hungarian adult population, the Program focuses on prevention of obesity and related diseases.
Objective: To study the prevalence and trend of overweight and obesity in adults by gender and age based on different categories of BMI, waist circumference /WC/, body fat percentage /BFP/, waist/height ratio /WtHR/. Comparative assessment of parameters. By the mean of 2010-2014, 2015-2019, 2020-2022 examine the impact of the Covid-19 pandemic period.
Material-Method: Anthropometric measurements, body composition analyses using InBody 720 bio-impedance method, statistical analysis with purified data. 2015-2019 N=54529 (male N=23786 mean age 40.0 y (SD:12.4) height 178.3 cm (SD:7.3) body weight 89.4 kg (SD:15.2) BMI 28.1 kg/m² (SD:4.3) WC 99.3 cm (SD:11.6) WtHR 0.56 (SD:0.07); female N=30743 age 42.9 y (SD:13.6) height 165.4 cm (SD:6.9) body weight 71.0 kg (SD:14.8) BMI: 26.0 kg/m² (SD:5.3) WC: 89.3 cm (SD:3.5) WtHR 0.54 (SD:0.009). Total N=161047 (86747 female 74340 male). 2010-2014 N=44392 female 36458 male; 2015-2019 N=31545 female 28297 male; 2020-2022 N=10810 female 9585 male, were evaluated using statistical methods.
Results: Overweight NS between 2010-2017 obesity (BMI≥30 kg/m²) showed increasing trend. Based on cumulative data 2015-2016 vs 2018-2019 NS (N=43676, BMI 25-30 kg/m² male: 47.6 vs 49.1%, female: 28.3 vs. 30.0%; BMI≥30 kg/m² male: 27.2 vs 28.3, female: 20.5 vs 20.3%. In analysis between 2015 and 2019 obesity increased significantly by age group in both sexes. Waist circumference, BFP in the risk category and WtHR≥0.55 (25-29 y male 29.3% female 18.2% vs above 70 y male 76.2% female 78,6%. Among the obesity parameters significant (p<0.001) correlations were found in all cases by gender (male, female): BMI-WC r=0.85, r=0.84, BMI-WtHR r=0.87, r=0.86, BMI-BFP r=0.69. r=0.74, WC-WtHR r=0.94, r=0.96, WC-FBP r=0.66, r=0.67, WtHR-BFP r=0.74, r=0.71. During COVID-19 pandemic obesity increased both by BMI and BFP. A significant increase is particularly prevalent in group under 45 y. COVID-19 mortality data with severe obesity diagnosis compared with official population data for severe obesity, we found that the death rate was significantly higher in the young adult age group.
Conclusions: Obesity is increasingly present in both sexes with age. The studied different obesity parameters show strong correlation. We found the strongest correlation between WC and WtHR. In addition to waist circumference measurement, we recommend introducing a simple calculation of the waist/height ratio into primary care to determine the risk of cardiovascular diseases. Obesity among 18-45 year requires special attention. In addition to preventing chronic NCDs on the basis of obesity, public health treatment of obesity can be recommended due to the more severe course and outcome of diseases confirmed in the case of infectious diseases, in order to improve all levels of prevention in this regard, in order to stop further progression.

PO2.012

Muscle Strength, Weight Status, and Their Combined Impact on Health and Healthcare Use in European Older Adults

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Introduction: Overweight/obesity and low muscle strength are critical public health concerns, particularly among older adults. Both factors individually contribute to adverse health outcomes, yet their combined effects on chronic diseases and healthcare utilization remain insufficiently studied. This study investigates these associations within a large European cohort.
Methods: This cross-sectional study utilized data from 53,217 participants aged 50 years and older, drawn from Wave 8 of the Survey of Health, Ageing, and Retirement in Europe (SHARE), representing 27 European countries. Overweight and obesity were assessed using body mass index (BMI), while muscle strength was evaluated via a handgrip strength test. Participants were categorized into four groups: Overweight and Low Muscle Strength (O/LM), Non-Overweight and Low Muscle Strength (NO/LM), Overweight and High Muscle Strength (O/HM), and Non-Overweight and High Muscle Strength (NO/HM). Statistical analyses, including chi-squared tests and Poisson regression models with generalized estimating equations (GEE), were conducted to examine the associations, with a p-value <0.05 considered statistically significant.
Results: Participants had a mean age of 69.0 years, with 56.9% being women. Among the sample, 63.0% were classified as overweight/obese. The median handgrip strength was 41.0 kg for men and 26.0 kg for women. The O/LM group (16.6%) showed significantly higher prevalence rates of chronic illnesses, including diabetes, stroke, cardiovascular disease, and Alzheimer's disease, as well as higher levels of polypharmacy, emergency hospitalizations, and prolonged hospital stays. Conversely, the NO/HM group (27.5%) exhibited the best health outcomes, with fewer chronic conditions and lower healthcare utilization.
Conclusion: The coexistence of overweight/obesity and low muscle strength is strongly associated with a heightened burden of chronic diseases and increased healthcare usage in older adults across Europe. These findings highlight the need for targeted interventions addressing both weight management and muscle strength enhancement to improve health outcomes and reduce healthcare costs. Routine monitoring of BMI and handgrip strength could play a crucial role in early risk detection and intervention.

PO2.013

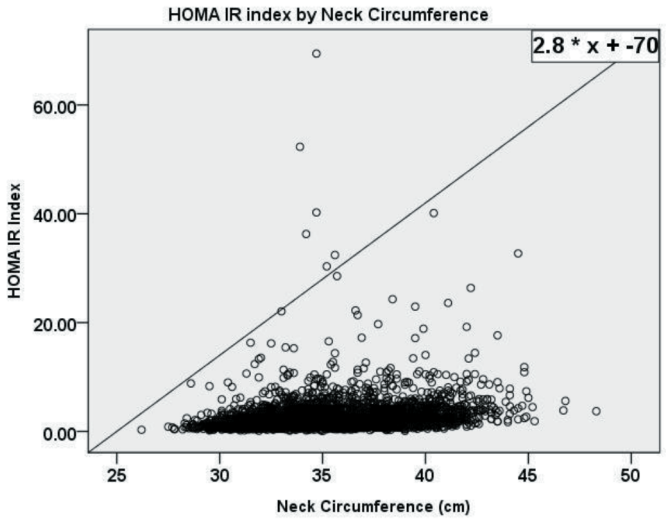
The Association between Neck Circumference and Insulin Resistance in adult general population

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To investigate the association between insulin resistance and neck circumference irrespective of metabolic syndrome risk variables in the general population.
We assessed the socio-demographic variables (smoking, alcohol, weight, and height, co-morbidities such as hypertension, diabetes, dyslipidemia), nutritional intakes (total energy, macro-nutrients), and cardio-metabolic variables (waist circumference, blood pressure, total cholesterol, triglyceride, HDL-cholesterol, LDL-cholesterol, fasting blood sugar, insulin), the neck circumference of the general population from 2020 KHANES (Korea Health National Analysis Nutrition after fasting for 8 hours. SPSS performed the Spearman's correlation analysis and ANOVA test for Windows (version 18, Il, USA). Statistical probability was considered to be less than 0.05 on both sides.
We investigated a total of 4.243 people (60.49 +/-.18 years, 24.26 +/-.05 kg/m2) aged over 40 years among 2020 KHANES datasets. After controlling for age, sex, waist circumference, blood pressure, total cholesterol, triglyceride, HDL cholesterol, macronutrient intakes such as carbohydrates, fat protein, and total energy intake, neck circumference was significantly associated with fasting blood glucose, insulin, glycated hemoglobin, and HOMA IR index, BMI. (p<.01) In addition, BMI, metabolic risk variables including waist, blood pressure, fasting blood glucose, HDL-cholesterol, triglyceride, WBC, insulin, HOMA IR index except total cholesterol were comparable according to the quartile status of neck circumferences. (p<.0001).
In conclusion, neck circumferences had significant associations with fasting blood glucose, insulin, glycated hemoglobin, HOMA-IR index, and BMI irrespective of age, sex, waist, blood pressure, total cholesterol, and triglyceride, HDL-cholesterol, total energy intake, macro-nutrient intake in the Korean general population. Further controlled clinical trials will be considered in the future.

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Neck Circumference by HOMA-IR Index

Fig. 1.

Neck Circumference	Q1 N=1085	Q2 N=1071	Q3 N=1030	Q4 N=1057	Significance
NC (cm)	31.16(.028)	33.56(.020)	36.26(.027)	39.67(.049)	.000
Age (years)	59.61(.38)	62.35(.346)	61.78(.366)	58.24(.342)	.000
WC (cm)	76.71(.22)	84.14(.225)	88.30(.240)	94.29(.228)	.000
BMI(Kg/m^2)	21.66(.07)	24.09(.086)	24.73(.102)	26.66(.091)	.000
Systolic Pressure (mmHg)	117.71(.54)	123.81(.514)	124.26(.505)	125.00(.257)	.000
Diastolic Pressure (mmHg)	72.81(.28)	75.004(.288)	76.31(.314)	79.81(.319)	.000
Fasting Plasma Glucose (mg/dL)	98.15(.59)	104.28(.757)	107.87(.878)	111.46(.836)	.000
Glycated Hemoglobin(g%)	5.77(.02)	5.96(.025	6.08(.013)	6.10(.029)	.000
Insulin (ug/L)	6.49(.13)	9.24(.333)	9.67(.258)	11.53(.272)	.000
Total Cholesterol (mg/dL)	193.48(1.18)	191.97(1.24)	185.49(1.32)	185.72(1.29)	.000
HDL-Cholesterol (mg/dL)	56.24 (.39)	63.00(.37)	48.28(.35)	44.51(.31)	.000
Triglyceride (mg/dL)	104.07(1.83)	123.46(2.15)	141.22(4.14)	179.00(4.43)	.000
HOMA-IR index	1.63(.041)	2.49(.11)	2.66(.08)	3.29(.09)	.000
Energy Intake (g)	1237.28 (20.79)	131.17 (21.03)	1477.89 (27.11)	1725.78 (29.28)	.000
Carbohydrate Intake (g)	235.23(3.09)	248.19(3.26)	286.78(4.02)	303.42(3.92)	.000
Protein Intake (g)	55.13(.91)	56.39(.96)	66.61(1.15)	79.10(1.51)	.000
Fat Intake (g)	34.97(.83)	34.44(.86)	39.63(.98)	48.91(1.30)	.000

Expressed as Mean (SEM)

Cardio-metabolic Risk Variables According to Neck Circumferences

Fig. 2.

Tab. 1.

Controlled for Age, Sex, Total Cholesterol, TG and Waist, Pressure, Energy Intake and Carbohydrate, fat and protein intake	Correlation (both sided) with HOMA-IR Index	Significance with HOMA-IR Index
Fasting Plasma Glucose	.463	.000
Hb A1C (Glycated Hemoglobin)	.352	.000
Insulin	.865	.000
HDL-Cholesterol	.005	.924
BMI	.130	.006
LDL Cholesterol	.037	.432
Neck Circumference	.190	.000

Association between Metabolic Variables and HOMA-IR Index After Controlling for Cardio-Metabolic Variables

PO2.014

Association between obesity risk and compliance with dietary recommendations: a pilot study of a new, simple dietary diary

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Introduction: Improving diet quality is a way to prevent obesity but many people find it difficult to follow dietary recommendations and to introduce intensive lifestyle changes. In this study the use of a new, simple dietary diary 'Self-monitorYourDiet®' to assess compliance with dietary recommendations in relation to obesity was tested.
Methods: Eighty female participants (20-24 years) were involved in the study. Body measurements were taken, and waist-to-height ratio (WHtR) was calculated. Incidence of central obesity (WHtR≥0.05) was determined. 'Self-monitorYourDiet®' was used to monitor the consumption of key food items: 6 food items recommended for consumption and 5 food items with limited consumption. Respondents completed the diary day by day for one month. The respondents' compliance with dietary recommendations was expressed as an Adherence Score (AdhS) in points (range 0÷12). One point was assigned for compliance with each recommendation and an additional point for compliance with the recommendation for fruits and vegetables in total (F&V). The following cut-offs (number of servings) were used to assess compliance with dietary recommendations – for F&V: ≥5 times/day, vegetables: ≥3 times/day, dairy foods: ≥2 times/day, fruits: ≥once a day, whole grains: ≥once a day, fish/seafood: ≥2 times/week, legumes/nuts/seeds: ≥once a week, meat products: ≤5 times/week, sweets/sugar/honey: ≤once a week, sweetened/energy drinks: ≤once a week, fast foods: ≤once a week, alcohols: ≤once a week. More points were awarded for better compliance with dietary recommendations. T-test and chi-square test for hypothesis testing were used.
Results: Central obesity was identified in 8% of participants. AdhS was non-significantly lower (p>0.05) in participants with central obesity compared to those without central obesity (mean±SD: 4.33±1.21 vs 4.74±1.78 points, respectively). In participants with central obesity compared to those without central obesity, there was a tendency (without significant differences) towards lower adherence to dietary recommendations regarding many food items. For example, fewer participants with central obesity than those without central obesity adhered to dietary recommendations regarding the consumption of legumes/nuts/seeds (67% vs 92% of participants, respectively), meat products (33% vs 58%), F&V (33% vs 53%), dairy foods (0% vs 14%), vegetables (0% vs 9%), fast foods (0% vs 7%).
Conclusion: In this sample of women, no significant association was found between central obesity and compliance with dietary recommendations. Further long-term studies should be conducted with a larger group of users of this dietary diary with different demographic and health status.

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PO2.015

Empowering Patients through Lifestyle Interventions: The Impact of the Patient Empowerment Program (PEP) in Cancer and Chronic Disease Populations

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Background: This abstract reviews findings from three studies evaluating the Patient Empowerment Program (PEP) in various clinical populations, including prostate cancer patients, a broader cancer cohort, and individuals with chronic diseases. The PEP model—a six-month, home-based intervention integrating physical activity, dietary guidance, mental health resources, and social support—aims to enhance health outcomes and quality of life through sustainable lifestyle changes.
Methods: In a randomized clinical trial, the Prostate Cancer-Patient Empowerment Program (PC-PEP) enrolled 128 prostate cancer patients into early intervention and waitlist-control groups, measuring weight loss, mental health, and functional outcomes. The Cancer Patient Empowerment Program (CancerPEP) involved 104 cancer patients randomized to receive the intervention with or without a Heart Rate Variability (HRV) biofeedback monitor, assessing psychological distress using the Kessler Psychological Distress Scale (K10). Lastly, Pictou County PEP was a feasibility study in a chronic disease cohort of 172 participants, assessing pre- and post-intervention outcomes in weight, psychological distress, quality of life, and sleep quality. Adherence to PEP was tracked via self-report and weekly digital engagement.
Results: Across studies, PEP interventions demonstrated significant positive outcomes. In the PC-PEP trial, the early intervention group experienced an average weight loss of 2.7 kg at six months ($p < 0.001$), with no adverse events or attrition reported. CancerPEP showed a marked reduction in psychological distress (aOR = 2.64, 95% CI: 1.53-4.56, $p < 0.001$), sustained at 12 months, with similar outcomes observed in a breast cancer subgroup. The Pictou County PEP study indicated improvements in weight (mean loss = 7.06 lbs, $p < 0.001$), psychological distress (mean reduction = 2.76, $p < 0.001$), and quality of life, with strong participant engagement evidenced by an average satisfaction score of 9.8/10 for a community retreat.
Conclusion: The PEP model demonstrates versatility and efficacy in improving physical and mental health outcomes across cancer and chronic disease populations. Key factors for success include structured support, community engagement, and accessible digital delivery options, which expand the reach of PEP to underserved populations. Policy implications suggest integrating such comprehensive lifestyle interventions into standard care and exploring solutions like endowed clinician sabbaticals to maintain program sustainability and address clinician burnout. These findings underscore the value of PEP as a scalable approach to enhancing patient outcomes and supporting healthcare resilience.

PO2.016

Partner Influence of Obstructive Sleep Apnea on Metabolic Syndrome in Couples

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Objectives: This study investigates the relationship between obstructive sleep apnea risk, as assessed by the STOP-Bang questionnaire, and metabolic syndrome among couples. It also examines how snoring and observed apnea associated with metabolic syndrome in couples.
Study design: Cross-sectional study using data from 2,436 couples in the Korea National Health and Nutrition Examination Survey (2019-2021). High risk of obstructive sleep apnea was defined as a STOP-Bang score of 3 or higher (excluding the hypertension item).
Main outcome measures: Metabolic syndrome in couples
Results: 47.6% of husbands and 5.7% of wives had high obstructive sleep apnea risk. Metabolic syndrome prevalence was 45.5% among husbands and 24.7% among wives. After adjusting for sociodemographic factors and health behaviors, wives whose husbands had high obstructive sleep apnea risk or reported snoring or observed apnea had 1.4-1.5 times higher odds of metabolic syndrome. Conversely, husbands' metabolic syndrome was not significantly associated with their wives' obstructive sleep apnea risk and sleep behaviors. The adjusted odds of metabolic syndrome in both partners were 2.8-4.4 times higher when only husbands had a high risk of obstructive sleep apnea or snoring, and 2.3-2.9 times higher when only wives had these sleep issues, compared to couples without such problems.
Conclusions: This study reveals a gender disparity in the impact of a spouse's obstructive sleep apnea risk on metabolic syndrome, emphasizing the need for a couple-focused approach in managing these health issues.

PO2.017

Evaluation of the Integrated Healthy Lifestyle Service for weight management and exercise referral in Southwark: a protocol

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Introduction: Southwark (UK) has an obesity prevalence of 41.8% in children and 51.1% in adults, with 68.9% of adults engaging in regular physical activity[1]. Southwark Council's Integrated Healthy Lifestyle Service offers an integrated approach to reducing obesity and physical inactivity through providing weight management and physical activity support services. Referrals to community services are managed via the Healthy Lifestyle Hub (HLH), a telephone-based triage service. The HLH aims to improve the efficiency of referrals, on the premise that this will improve service access, uptake and adherence. Post-programme follow-up occurs to support behaviour change. Service users can be referred into one of two community-based programmes to manage weight and increase physical activity; Exercise on Referral (EoR) for adults, and Alive'N'Kicking (AnK) for children 4-17 years old. An independent evaluation via the Public Health Intervention Responsiveness Studies Teams scheme will be conducted to inform future service delivery and development.
Methods: The evaluation approach was informed through an evaluability assessment with Southwark Council and Everyone Health (a third party who deliver HLH, AnK and EoR), and consultation with local residents. An approach combining process and outcome evaluation was recommended. Two key evaluation questions were developed; 1) Is the HLH facilitating access to health improvement services (AnK/EoR)? 2) Does referral from the HLH to AnK and EoR improve health behaviours/outcomes? The evaluation questions will be addressed by three work packages (WPs). WP1 will involve secondary data analysis of data collected by those who have contacted HLH or been enrolled in EoR/AnK. WP2 will consist of an online survey of HLH service users to understand why individuals were referred but did not initiate programmes. WP3 will explore experiences of the service(s) by conducting focus groups/interviews with service users, Everyone Health staff and non-initiators.
Conclusion: Finding will inform future service delivery and inform the recommissioning of a single point of access to weight management and physical activity services. Collaboration during the evaluability assessment strengthened the protocol development and ensured the evaluation will

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be useful to commissioners, service providers and residents. Conducting a rigorous evaluation of a single point of access to community-based integrated weight management service will also be useful for other local governments within the UK, given around 10% are using similar models for delivering weight management services. Evaluation findings may assist in delivery and improvement of community-based healthcare systems which were highlighted as critical in the recent Darzi report[2].

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PO2.018

Trends in Years of Life Lost Attributable to Diabetes in South Korea, 2008–2019

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Aims: Diabetes remains a significant public health concern globally. This study aims to analyze the trends in years of life lost (YLL) attributable to diabetes in South Korea from 2008 to 2019.

Methods: Data from the Korean National Health Insurance Service-National Sample Cohort was utilized to estimate the mortality rate and YLL associated with diabetes during 2008–2019. YLL was calculated using Poisson regression to model the transition from a state without diabetes to a state with diabetes, incorporating spline effects of age and calendar time as independent variables. Cause-specific contributions to YLL differences between individuals with and without diabetes were assessed using Arriaga's decomposition method to identify major contributors to changes in life expectancy.

Results: Between 2008–2011 and 2016–2019, the YLL attributable to diabetes at age 40 decreased from 8.2 to 5.6 years in males and from 7.4 to 5.2 years in females. Over the same period, YLL decreased with increasing age, with reductions at age 80 from 1.1 to 0.9 years in males and from 1.7 to 1.4 years in females. During 2008–2011, at age 40, cancer was the leading cause of the reduction in life expectancy associated with diabetes (34.9% in males and 26.7% in females), followed by cardiovascular disease (16.6% in males and 24.9% in females) and diabetes-related mortality (16.6% in males and 23.3% in females). By 2016–2019, cancer's contribution increased further (36.7% in males and 33.6% in females). By this time, at age 80, diabetes itself (31.2% in males and 33.9% in females) became the leading cause of reduced life expectancy, followed by cancer (25.5% in males and 21.7% in females) and infections (22.0% in males and 20.1% in females).

Conclusion: The decline in YLL attributable to diabetes over time reflects advancements in diabetes management and care. However, the age-specific differences in YLL drivers highlight the need for tailored interventions. Efforts to address cancer and infections, particularly in older populations, alongside traditional diabetes and cardiovascular care, are essential to sustain and improve outcomes across all age groups.

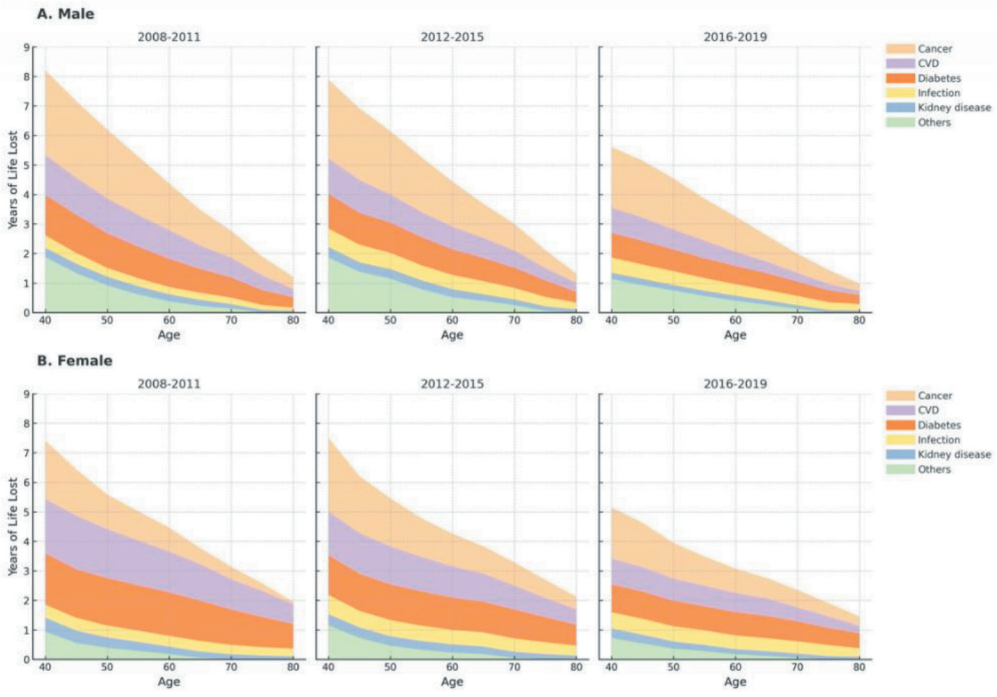


Fig. 1. Trends in Years of Life Lost Due to Diabetes in South Korea, 2008–2019.

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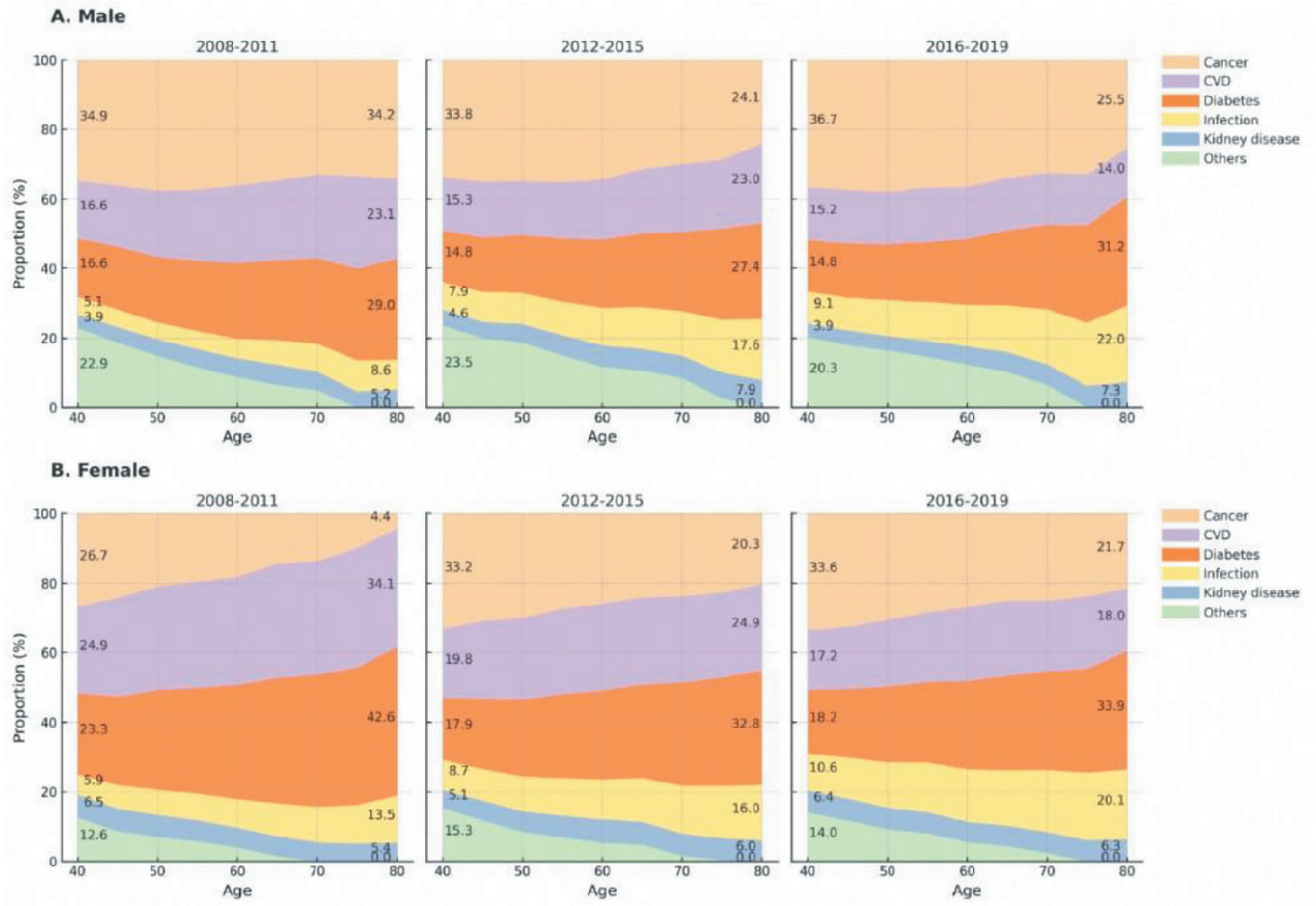


Fig. 2. Trends in Cause-Specific Contributions to Years of Life Lost Due to Diabetes in South Korea, 2008–2019.

PO2.019

Role of rs9939506 polymorphism of FTO gene in resistance to eating in male adolescents

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Background: Single Nucleotide Polymorphisms (SNPs) of the Fat mass and obesity-associated (FTO) gene may be associated with obesity by regulating appetite. The present study aimed to investigate the relationship between FTO genotype and resistance to eating in male adolescents.
Methods: The present cross-sectional study included 246 adolescent boys in Tehran, Iran, who were assessed for self-efficacy related to weight control using the Weight Efficacy Lifestyle (WEL), questionnaire, food intake using the Food Frequency Questionnaire (FFQ), physical activity using the International Physical Activity Questionnaire (IPAQ), and anthropometric indices using Bio-Impedance Analyzer (BIA). Moreover, the participants underwent genotyping for the rs9930506 polymorphism of the FTO gene, and the relationship between FTO genotype and resistance to eating was investigated using different models of multiple linear regression.
Results: According to our findings, there was a significant reverse relationship between the FTO rs9930506 genotype and resistance to eating (β: -0.16, P=0.01). Moreover, the relationship was still significant after adjusting for age, nutritional knowledge, BMI, and mother's BMI, educational level, and occupational status.
Conclusion: According to our results, the FTO genotype had a significant effect on resistance to eating and food desires. However, there is a need for further studies to evaluate the underlying mechanisms of the effects of the FTO gene on appetite and obesity.

PO2.020

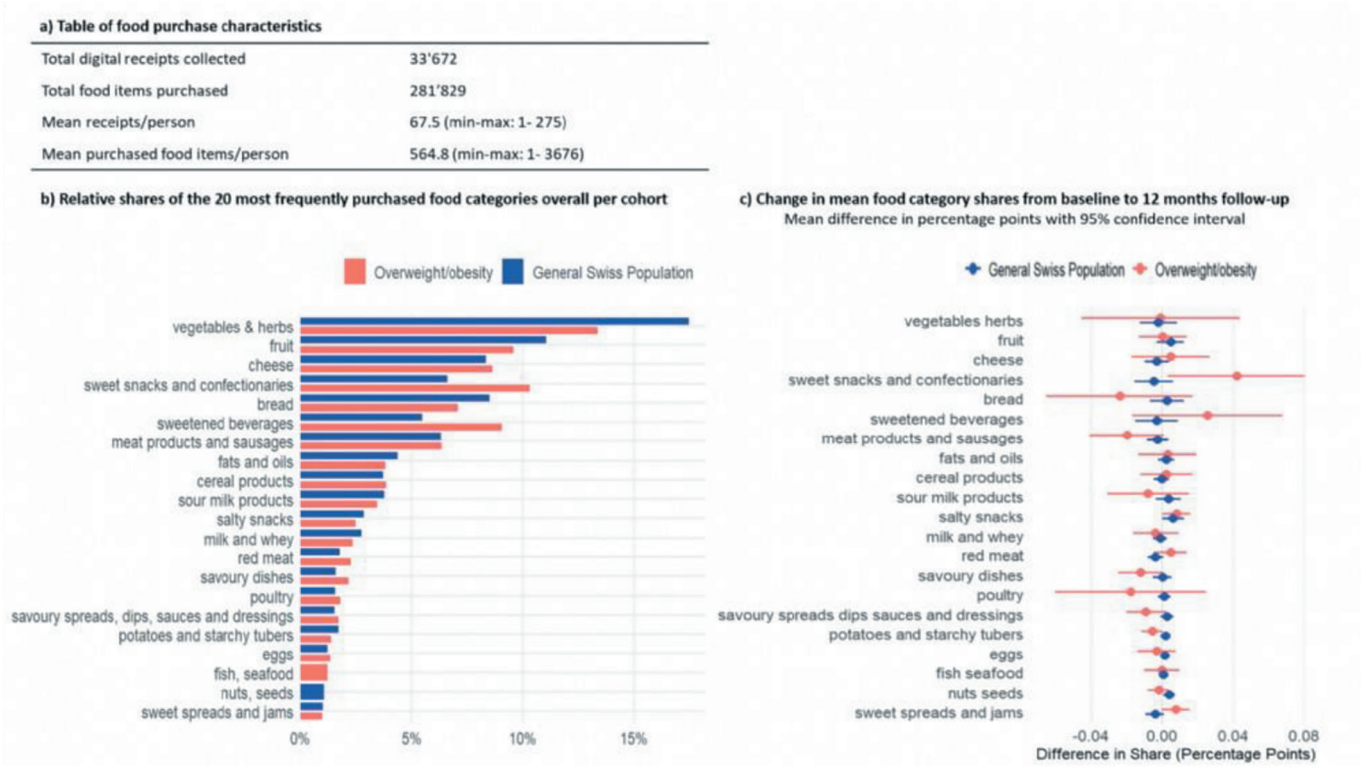
Food purchase patterns in people starting GLP-1 receptor agonist medication compared to the general population

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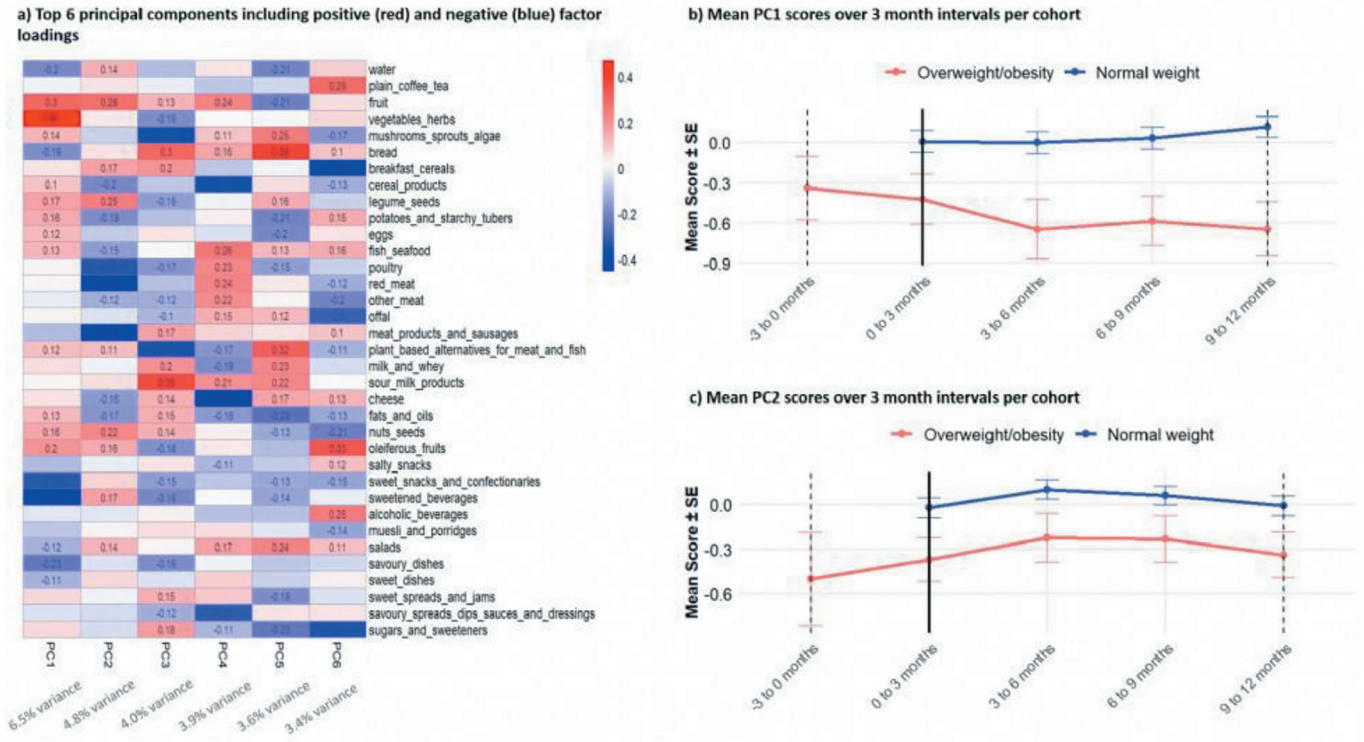
Introduction: The introduction of GLP-1 receptor agonists (GLP-1RA) has marked a new era in the treatment of excess body weight. While the effect on weight loss is well established, the impact of these medications on dietary choices and food patterns is less understood. Automatically collected food purchase (FP) data may serve as a novel and scalable proxy of food consumption in the surge of GLP-1RA prescriptions. Here, we

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a) Dataset overview. b) Relative shares of the 20 most frequently purchased food categories overall for the overweight/obese (red) and general Swiss population (blue). c) Relative change (mean difference in percentage points with 95% confidence interval) in mean food category shares from baseline to 12 months follow-up of the 20 most frequently purchased food categories for the overweight/obese (red) and general Swiss population (blue).

Fig. 1.



a) Top 6 principal components displaying positive (red) and negative (blue) factor loadings and their variance. Mean PC1 (b) and PC2 (c) scores over time for the overweight/obese (red) and normal weight individuals (blue).

Fig. 2.

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leverage digital receipts to contrast FP patterns in individuals starting GLP-1RA therapy for weight loss versus individuals with a normal weight.
Methods: Digital receipts from grocery purchases from 27 overweight/obese adults starting GLP-1RA therapy and 474 Swiss adults were obtained via their loyalty card accounts from Swiss food retailers (data collection: overweight/obese, 3 months pre to 12 months post GLP-1RA start; general population, 15 months after first purchase). Purchased items were matched to nutritional information using a food composition database. FP patterns were analysed in 3-month intervals. Principal component analysis (PCA) was perform on relative shares of food categories to address the high dimensionality and strong correlations in the dataset. Comparisons of FP between overweight/obese and normal-weight individuals, as well as changes over time during the course of GLP-1RA treatment were assessed using linear models. Individuals from the general population with a BMI≥27kg/m² (N=32) were included in the obese/overweight group.
Results: Pre-treatment body weight in the GLP-1RA group (95% Liraglutide, 5% Semaglutide) was 108.3±23.7kg (BMI 39.1±6.3kg/m2, 67%♀, 45±11yrs) and 74.3±17.0kg (BMI 24.2±.4kg/m2, 35%♀, 35±11yrs) in the control group. Weight loss after 1 year of GLP-1RA was 11.9%±7.2%. The relative contributions of food categories to total purchases are illustrated in Figure 1a-b with changes over time presented in 1b-c. PCA revealed differences in FP between the cohorts. The first principal component (PC1, 6.5% variance) reflects a 'whole-foods-oriented pattern' with positive loadings for vegetables and fruits, and negative loadings for sweet beverages, snacks, and dishes (Figure 2a). PC2 (4.8% variance) represents a 'plant-based protein pattern' dominated by negative loadings of all meat and cheese products and positive loadings to legumes, nuts, and seeds (Figure 2a). Overweight/obese individuals had a lower PC2 score (p=0.008) and a marginally lower PC1 score (p=0.055), indicating less adherence to 'whole-foods' and weaker association with 'plant-based protein' compared to normal weight individuals (Figure 2b-c). No significant changes were observed following GLP-1RA initiation throughout the 15-month period.
Discussion: Our results indicate less healthy FP patterns in overweight/obese individuals compared to the normal weight population. However, FP patterns remained largely unaffected over 12 months of GLP-1RA treatment, with high variability between individuals. While our findings are preliminary, automatically collected longitudinal FP data may allow insights into how emerging GLP-1RA treatment affects real-life food decision making.

PO2.021

Behavioural components and delivery features of early childhood obesity prevention interventions: a systematic review and intervention coding of studies in the TOPCHILD Collaboration

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Introduction: Early childhood obesity prevention interventions that aim to change parent/caregiver practices related to infant (milk) feeding, food provision and parent feeding, movement and/or sleep health (i.e. target behaviour domains) are diverse and heterogeneously reported. We aimed to 1) systematically characterise the target behaviours, delivery features, and Behaviour Change Techniques (BCTs) used in interventions in the international Transforming Obesity Prevention for CHILDren (TOPCHILD) Collaboration, and 2) explore similarities and differences in BCTs used in interventions by target behaviour domains.
Methods: Systematic searches were performed in five databases and two clinical trial registries, from inception to February 2023. Trialists from eligible randomised controlled trials of parent-focused, behavioural early obesity prevention interventions shared unpublished intervention materials. Standardised approaches were used to code target behaviours, delivery features and BCTs, using novel approaches of coding unpublished intervention materials and validation meetings with trialist to confirm coding. Narrative syntheses were performed.
Results: 32 trials reporting 37 active intervention arms were included. Interventions targeted a range of behaviours, most frequent combination targeting all behaviour domains (n=15/37) Delivery features varied greatly. Most interventions were delivered by a health professional (n=26/36), included facilitator training (n=31/36), and were interactive (n=28/36). Overall, 49 of 93 BCTs were coded to at least one target behaviour domain. The most frequently coded BCTs were: Instruction on how to perform a behaviour (n[arms by domain]=102), Behavioural practice and rehearsal (n=85), Information about health consequences (n=85), Social support (unspecified) (n=84), and Credible source (n=77). Similar BCTs were often used for each target behaviour domain.
Conclusions: Our study provides the most comprehensive description of the behaviour change content of complex interventions targeting early childhood obesity prevention. Our analysis revealed interventions targeted multiple behaviour domains, with significant variation in delivery features. Despite the diverse range of BCTs coded, five BCTs were consistently identified across domains, though certain BCTs were more prevalent in specific domains. These findings can inform future examination of components associated with intervention effects and design of future interventions to draw on commonly used components in existing interventions and gaps in underused intervention components.

PO2.022

Impact of Bariatric-Metabolic Surgery on Patient's Biopsychosocial Wellbeing One Year Post-Procedure: A Qualitative Study of the DigiWELL Project

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Introduction: Research indicates that maintaining a healthy lifestyle contributes to increased longevity, decreased risk of chronic diseases, enhanced quality of life, and improved overall well-being. The incidence of obesity and bariatric surgeries is rising, and postoperative care following the procedures continues to improve. Still, there remains a lack of recommendations regarding more comprehensive lifestyle modifications, particularly in the areas of psychological support and physical activity. Digital technologies offer potential for gaining deeper insights into behavioral patterns and for providing support for individuals with obesity. This study aims to explore how bariatric patients perceive changes in biopsychosocial well-being subsequent to a physical activity intervention delivered using wearable wrist devices to facilitate and motivate them towards adopting a healthier lifestyle.
Methods: The qualitative study employed a semi-structured interview methodology, complemented by observations. A purposive sampling was performed. The study included participants (average age 46,5±7,3 years) from the quantitative study who participated in the physical activity intervention (N=17; men=4, women=13; control group=7, experimental group=10) and were at least one year post-surgical procedure. The discussions were audio-recorded for subsequent verbatim transcriptions. The transcripts were coded using MAXQDA software, where independent open coding was conducted and primary themes and subthemes were established. The results were analyzed by four researchers using a qualitative thematic analysis.
Results: The interviews explored biopsychosocial well-being in relation to bariatric-metabolic surgery. The areas of greatest importance were increased self-esteem, decreased social isolation, positive body image, and perceived benefits of physical activity. Adverse effects have also been observed, particularly in the social domain, including alterations

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in intimate relationships and a lack of support from social networks. Participants characterized bariatric surgery as life-saving and reported improvements in overall health over time, with resolution of prediabetes, hypertension, and hypercholesterolemia. Another important topic explored the role of digital technology in patient recovery post-surgery. The participants perceived the use of digital technology favorably with some individuals finding it beneficial and motivational in reaching their goals.
Conclusion: It is important that the areas deemed to be significant by the participants are addressed by the multidisciplinary teams, as this may provide important facilitation of monitoring, support, and motivation. In this research, wearable devices, particularly smartwatches, have been found to be useful tools for data collection, which can assist in shaping the personalization of mHealth interventions. Furthermore, smartwatches offer technological advantages and minimal disruption to daily routine.

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PO2.023

Weight-friendly Workplaces in Sunderland: "Healthy Food environments"

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Introduction: Obesity affects quality of living and can result in a variety of adverse health outcomes, with healthy lifestyles playing a part in reducing preventable disease, disability and premature death. In North-East England, the percentage of adults living with overweight/obesity in 2022 was 68% and had the highest percentage of individuals living with obesity at 39%, in comparison to the national average of 64% and 29% respectively. As many adults spend significant periods of their time in the workplace, employers are uniquely positioned to influence the health outcomes of their employees. Workplace environments have been identified as playing a crucial role in shaping employee health behaviours and dietary habits, and the provision of a "healthy food environment" can have health benefits for employees. This study aimed to explore employer and employee perceptions of "healthy food environments", workplace food availability and options, and employee satisfaction with current offerings. The study also examined employer systems for promoting a healthy lifestyle, and assessed other factors which could impact upon employees' ability to eat healthily at work.
Methods: A mixed-methods research study to investigate factors affecting healthy eating in the workplace was conducted across a varied range of workplaces located in Sunderland. Eight interviews were conducted with employers to identify broad themes that informed the structuring of a questionnaire targeting their employees. The online questionnaire employed both quantitative and qualitative open-ended questions for which 78 employee survey responses were collected. Data were analysed qualitatively using thematic analysis, and quantitatively using descriptive statistics.
Results: The major themes identified were categorised as being determined at either a personal level or by the workplace determinants, with sub-themes of knowledge, habits, healthy lifestyle promotion, options, facilities and job role. It was seen that job role and/or type of work impacted upon individual options and choices as those with physically active job roles often chose calorie-dense foods to overcome fatigue. Home/hybridised work patterns were highlighted as providing beneficial opportunities to prepare healthier and cost-effective meals. Participants suggested potential barriers to developing and sustaining healthy dietary habits, including limited availability to store, prepare or buy healthier foods in the workplace.
Conclusion: The adoption of a healthy lifestyle is both workplace dependent and attributable to individual personal responsibility. There is scope for employers to increase their impact on supporting positive employee health motivation and behaviours with a broad and consistent provision. Enablers for developing and maintaining healthy dietary habits include; workforce education by employers, availability of appealing hot and cold healthy options with nutritional information, availability of foods and food preparation facilities, and healthy lifestyle incentives/promotions.

PO2.024

Parental feeding practices differ between caregivers of children and adolescents with Autism Spectrum Disorders (ASD) and various BMI statuses

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Introduction: Parental feeding practices affect the dietary intake of children and adolescents formulating their Body Mass Index (BMI) [1]. The present analysis aimed to explore whether parental feeding practices of caregivers of children and adolescents diagnosed with Autism Spectrum Disorders (ASD) differ based on children's and adolescent's BMI status.
Methods: In the present analysis 84 boys and girls, aged 2.5 to 17.5 years old, diagnosed with ASD, were included. The caregivers of all children and adolescents completed questionnaires on the demographic and anthropometric parameters of their children, as well as the validated Comprehensive Parental Feeding Questionnaire (CPFQ) [2]. This tool assesses 6 parental feeding practices namely "monitoring", "child control", "emotion regulation/food as a reward", "pressure to eat", "restriction", and "healthy eating guidance". BMI was assessed based on the Cole cut-offs [3]. In the present analysis, children and adolescents were allocated into two groups based on their BMI status: 1) participants with normal weight (PWN), and 2) participants with overweight or obesity (PWO). The normal distribution of variables was tested using the Kolmogorov–Smirnov test. All hypotheses were tested at a 5% significance level.
Results: Between-group analysis showed that parents of PWN restricted less often their children's dietary intake ($p< 0.001$), and pressed more often their children to eat ($p< 0.001$), compared to their counterparts of PWO. Sub-analysis in specific practices revealed that the two groups differed in encouraging the child to eat less to prevent weight gain ($p=0.001$), serving the child small portions during meals to better regulate its weight ($p=0.001$), reducing the intake at the next meal in case the child consumes more than usual during a meal ($p=0.001$), restricting child's access to food that may increase its weight ($p=0.009$), encouraging the child that eats very little, to eat more ($p=0.001$), prohibiting the child of eating between the meals to prevent weight gain ($p=0,003$), controlling the weight by placing the child on a diet ($p=0.001$) and encouraging the child to take one or two more bites, if it says that is finished eating ($p=0.001$).
Conclusion: The study showed caregivers of children with ASD and overweight or obesity tend to implement stricter dietary restrictions and exert less encouragement for food consumption, compared to their counterparts having children with ASD and normal weight. More research is necessary to verify the results and to explore these findings further.

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PO2.025

Readiness to change the body weight

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Introduction: Health-related behaviours characterise the actions of individuals that can improve or harm the health of individuals and/or the community as a whole. Readiness for change represents a complex multidimensional apprehension including psychological and other fundamental factors, occurring on both levels, individual and social. Change can be characterized as a process that unfolds in multiple stages over time - precontemplation, contemplation, preparation, action, consolidation, and closure. Assessing the readiness for change can play a key role in identifying barriers and at the same time contribute to improving the management of weight loss in patients with overweight and obesity. This work carried out quantitative research in order to evaluate the readiness to reduce body weight in individuals with overweight and obesity in the conditions of primary health care.
Methods: The methodology of the work was based on questionnaire research among individuals with overweight and obesity in selected doctors' offices and community pharmacies. The assessment of the level of readiness for weight loss was based on the Transtheoretical Model of Change. The main goal of the work was to analyse the readiness of patients with overweight and obesity to change their body weight and to compare the stages of readiness for weight change in two research groups. 147 volunteers from selected doctors' offices and 57 volunteers from community pharmacies with overweight and obesity (BMI ≥25 kg/m2) took part in this cross-sectional study.
Results: The research sample of respondents from the selected doctors' offices was predominantly in the maintenance (35%) and action (33%) stages. Respondents from community pharmacies were mostly represented in the precontemplation stage (47%). The data collected showed that respondents with higher BMI in both groups often failed to maintain their desired weight in the long term (>6 months) (r=0.20, p<0.05; r=0.34, p<0.05). Among respondents from community pharmacies, factors such as age, education, income and chronic disease had a significant influence on failure (p<0.05). A more active effort to apply changes leading to weight loss was observed among more educated respondents (r=-0.18, p<0.05) with a higher BMI (r=-0.24, p<0.01) in selected doctors' offices. In case of community pharmacies, more active were younger women (r=0.30; r=0.32, p<0.05), who did not suffer from any chronic disease (r=-0.36, p<0.01). Older participants with overweight (r=0.45; r=-0.39, p<0.01) from community pharmacies and with chronic disease (r=-0.33, p<0.05) did not plan at all change in their body weight.
Conclusion: We observed differences in stages of readiness between respondents in the two research groups. Most of the respondents from the selected doctors' offices were in the maintenance stage (35%), whereas the respondents from the community pharmacies were in the precontemplation stage (47%). Behavioural counselling based on advice matched to the stage of readiness for change may encourage healthy lifestyles among people with overweight and obesity.

PO2.026

Healthcare Professionals' Knowledge Levels on Nutrition and Food-Drug Interactions Based on Body Mass Index

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Introduction: Healthcare workers have responsibilities such as protecting public health and providing better service and treatment to patients. In this context, healthcare professionals need to have knowledge about healthy eating as well as about drugs and food-drug interactions. The aim of this study is to evaluate the nutrition and food-drug interaction knowledge levels of healthcare workers according to their body mass index (BMI).
Methods: This descriptive cross-sectional study was conducted between April 20, 2024, and June 20, 2024, at Kocaeli University Umuttepe Hospital with 212 healthcare workers (midwives, nurses, doctors, dietitians, and pharmacists). The study protocol was carried out following the guidelines determined by the Helsinki Declaration, and ethical approval was obtained from the Haliç University Non-Interventional Clinical Research Ethics Committee. The sociodemographic characteristics of the volunteers, their nutrition knowledge level using the "Nutrition Knowledge Scale for Adults (YETBİD)," and their food-drug interaction knowledge level using the "Scale to Determine Food-Drug Interaction Knowledge Level Among Healthcare Workers" were assessed online. SPSS Statistics 25.0 statistical package program was used to evaluate the obtained data, and in all statistical analyzes, the confidence interval was evaluated at 95% and the significance level was p<0.05.
Results: This study was conducted with 212 healthcare workers, the majority of whom were women (73.11%). The average age of the participants was 28.80±7.52 years, and the mean BMI was 23.38±3.83 kg/m2. It was determined that nutrition knowledge and food-drug interaction knowledge did not differ according to BMI (p>0.05). No relationship was found between BMI and basic nutrition knowledge, food preference knowledge, or food-drug knowledge (p>0.05). On the other hand, a weak positive relationship was found between basic nutrition knowledge and food preference knowledge (r= 0.355, p< 0.001), and a very weak positive relationship was observed between food preference knowledge and food-drug knowledge (r= 0.207, p=0.003).
Conclusion: It was determined that the participants had moderate levels of nutrition and food-drug interaction knowledge, and these knowledge levels did not vary according to BMI. In this context, there is a need for initiatives to increase the nutrition and food-drug interaction knowledge levels of healthcare workers.

Tab. 1.

Table 1. Participants' BMI and Food-Drug Information

	Participants with Underweight (n=16)	Participants with Normal (n=134)	Participants with Overweight (n=48)	Participants with obesity (n=14)
Food and Drug Information	8.37±5.09	8.54±5.55	8.75±5.84	8.50±6.19
Basic Nutrition Information	49.68±10.46	50.03±8.30	49.70±8.56	48.50±5.88
Food Preference Information	32.21±5.79	33.56±4.60	34.02±4.85	33.28±5.79

Table 2. Results of Correlation Analysis Between Variables

		Basic Nutrition Information	Food Preference Information	Food and Drug Information
BKİ	r	-0.050	0.075	0.028
	p	0.467	0.276	0.686
Basic Nutrition Information	r		0.355	0.084
	p		**0.000**	0.225
Food Preference Information	r			0.207
	p			**0.003**

spearman correlation test, p<0,05

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PO2.027

Prevalence and biopsychosocial factors associated with overweight and obesity in adults with type 1 diabetes

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Introduction: Overweight and obesity are increasingly recognized as important health problems in people living with type 1 diabetes (PLwT1D). We aimed to describe the prevalence of overweight and obesity in adults with type 1 diabetes (T1D) and examine the relationship between weight status and a combination of sociodemographic, clinical-metabolic, and psychological factors hereinafter called biopsychosocial factors in these PLwT1D.
Methods: We conducted a single-centre, cross-sectional study in adults with T1D attended at a tertiary hospital from January 2018 to July 2020. Participants completed an online survey sent through the institutional web platform in October 2020 that included validated questionnaires in Spanish to assess physical activity (International Physical Activity Questionnaire); to measure anxiety and depression (Hospital Anxiety and Depression Scale); to evaluate the perception of health-related quality of life [Spanish version of Diabetes Quality of Life Questionnaire (EsDQoL)] and to assess eating disorders [Spanish version of Diabetes Eating Problem Survey (EPAD-R)] and neuroticism (Neuroticism scale of the Eysenck Personality Questionnaire-Revised-Abbreviated). Sociodemographic data (age, sex, marital status, living conditions, education level, occupation, employment situation, household income category) were also included. Electronic medical records were used to collect data from the last visit regarding diabetes history, long-term complications, current insulin treatment, anthropometric [height (cms) weight (kg)] and laboratory data.
Results: Data from 459 surveys were available for analysis. Participants had a mean age of 44.7 years (range 18-83); 55.6% were women; body-mass index (BMI) 26.0 (4.7) kg/m2 and mean HbA1c was 7.57%. The prevalence of overweight (BMI 25-29.9 kg/m2) and obesity (BMI >30 kg/m2) was 38.8% and 14.8%, respectively, with 10.6% being class I (30-34.9 kg/m2), 2.2% class II (35-39.9 kg/m2) and 2.0% class III (>40 kg/m2). Older age, living with a child/children, a higher EPAD-R score, a higher total insulin dose (IU/kg per day), receiving lipid-lowering treatment, and a higher EsDQoL score in the diabetes-related worries dimension were associated with a greater likelihood of living with obesity. On the contrary, HbA1c and social/vocational worries showed a negative relationship with the dependent variable. That is, higher levels of HbA1c and a higher EsDQoL score in the social/vocational worries dimension were associated with a lower probability of living with obesity.
Conclusion: Overweight and obesity are highly prevalent among adults living with T1D. The identified biopsychosocial factors provide valuable insights into the complex nature of energy balance in these patients. Our study contributes to this field by providing a comprehensive evaluation of factors associated with overweight and obesity in PLwT1D.
Strengths and Limitations: Strengths of our study include a comprehensive assessment of biopsychosocial factors and a relatively large sample size. Limitations include the cross-sectional nature of the data and potential selection bias due to the online survey methodology.

PO2.028

The Science of Eating Right: Behavioral Interventions for Better Health

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As a behavioral scientist specializing in health science, this paper explores the interdisciplinary field of behavioral interventions aimed at improving health through proper eating habits. The focus is on understanding how individuals make food choices and the psychological factors that influence their decisions. Applying behavioral theories and evidence-based practices, the paper discusses strategies for promoting healthier dietary behaviors. Drawing on research from various disciplines including psychology, nutrition, and public health, the paper emphasizes the importance of education, motivation, and environmental influences in shaping eating behaviors. Through a comprehensive review of key studies and interventions, this paper aims to provide insights and recommendations for implementing effective strategies to encourage individuals to make healthier food choices for better overall health and well-being.

PO2.029

Cardiovascular outcomes and safety of SGLT-2 inhibitors in patients with diabetes of the exocrine pancreas: A nationwide population-based study

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Aims: Diabetes of the exocrine pancreas (DEP) is a form of diabetes caused by structural or functional damage to the exocrine pancreas. Despite its clinical significance, there is a paucity of comprehensive research on effective pharmacological treatments for DEP. This study aimed to evaluate the cardiovascular outcomes and safety of sodium-glucose cotransporter 2 (SGLT2) inhibitors in patients with DEP.
Materials-Methods: This retrospective cohort study used data from the Korean National Health Insurance Service database, encompassing 66,120 patients with DEP who initiated anti-diabetic therapy between September 2014 and December 2022. Propensity score matching (1:1) was performed to compare new users of SGLT2 inhibitors with those using other anti-diabetic medications, yielding a cohort of 9,738 participants. Cox proportional hazards models were employed to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for various outcomes, including myocardial infarction, stroke, hospitalization for heart failure (HHF), diabetic ketoacidosis (DKA), severe hypoglycemia, bone fractures, genital infections, urinary tract infections (UTIs), pancreatitis, and pancreatic cancer.
Results: The use of SGLT2 inhibitors was associated with a significant reduction in the risks of stroke (HR 0.57; 95% CI 0.42–0.78). There was no significant difference in the risks of HHF or myocardial infarction between the SGLT2 inhibitor and non-user groups. The risk of hypoglycemia, DKA, and pancreatic cancer was comparable between the two groups. While SGLT2 inhibitor use was linked to an increased risk of genital infections, it was associated with a reduced risk of UTI, bone fractures, and pancreatitis.
Conclusion: This nationwide population-based study demonstrates that initiating SGLT2 inhibitors can reduce the risk of stroke in patients with DEP, and SGLT2 inhibitors can be used safely in this patient population.

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PO2.030

Psychological characteristics influencing weight loss in severe obesity

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Introduction: This study investigated the role of cognitive eating-related psychopathology, irrational food beliefs, and internalized weight stigma as predictors of weight loss in individuals with severe obesity undergoing a brief intensive cognitive behavioral therapy for obesity (CBT-OB) program.
Methods: A total of 400 patients (mean BMI: 41.9 kg/m²; mean age: 55.9 years) completed a 21-day intensive CBT-OB intervention, followed by a 12-month follow-up assessment. Key measures included the Eating Disorder Examination Questionnaire, the Weight Bias Internalization Scale, and the Irrational Food Beliefs Scale, which were administered at both admission and discharge. Body weight was assessed at the 12-month follow-up.
Results: At the 12-month follow-up, 42.3% of participants achieved clinically significant weight loss (≥5%), and binge-eating episodes showed a marked reduction. Cognitive factors, such as lower baseline eating concerns, higher baseline weight concerns, and greater improvement in irrational beliefs (particularly self-deception related to eating and weight control), were identified as significant predictors of weight loss. In contrast, internalized weight stigma did not emerge as a significant predictor within this cohort.
Discussion: The findings highlight the critical role of specific cognitive factors in predicting long-term weight loss outcomes in individuals with severe obesity. Targeting irrational food beliefs and fostering flexible dietary restraint could enhance the effectiveness of obesity treatments. These results underscore the need for personalized cognitive-behavioral interventions that address maladaptive thought patterns to optimize weight loss and maintenance. Future research should aim to refine these approaches to maximize their clinical utility.

PO2.031

Neck/waist ratio might be associated with vitamin D intake in the people without obesity

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Previous observational studies suggested that obesity is associated with low vitamin D. Therefore, we assessed to investigate the association between neck/waist ratio and vitamin D intake in people without obesity
A total of 382 peoples without obesity, under 23 kg/m2 (female 76.2%) were recruited from 2020 KNHANES (Korea National Health Analysis and Examination Survey). We collected the demographic variables, cardio-metabolic risk variables (waist circumferences, blood pressures, total cholesterol, HDL-cholesterol, triglyceride, fasting plasma glucose), nutritional intakes (macronutrients, Vitamin D, mineral intakes). We compared the measured variables of the subjects according to quarterly groups of neck/waist ratio (Q1,Q2,Q3,Q4). The ANOVA analysis were performed using by SPSS for windows (version 18:Il,USA) and probabilities were considered as significant less than 0.05 at both sided.
In conclusion, lower neck/waist ratio group showed significantly higher vitamin D intakes (10.58ug) than higher ratio group (2.94ug) in people without obesity ($p<0.01$). Further controlled clinical trial would be needed in the future.

Tab. 1.

	Quarterly Group	N	Mean	Std Error of Mean	P-values
Age	Q1	7	44.29	1.322	.589
Age	Q2	51	44.59	.412	.589
Age	Q3	112	44.29	.266	.589
Age	Q4	212	44.74	.192	.589
Waist Circumferences	Q1	7	83.31	1.056	.000
Waist Circumferences	Q2	51	78.25	.586	.000
Waist Circumferences	Q3	112	75.61	.410	.000
Waist Circumferences	Q4	212	72.11	.430	.000
Neck Circumferences	Q1	7	31.06	.127	.000
Neck Circumferences	Q2	51	31.57	.237	.000
Neck Circumferences	Q3	112	31.97	.171	.000
Neck Circumferences	Q4	212	33.08	.197	.000
BMI	Q1	7	21.49	.593	.000
BMI	Q2	51	21.57	.170	.000
BMI	Q3	112	21.32	.100	.000
BMI	Q4	212	20.29	.111	.000
Vitamin D intake (u g)	Q1	7	10.58	3.820	.003
Vitamin D intake (u g)	Q2	51	2.28	.411	.003
Vitamin D intake (u g)	Q3	112	3.70	.874	.003
Vitamin D intake (u g)	Q4	212	2.94	.256	.003

Cardio-metabolic Variables According to Neck/Waist Ratio

PO2.032

FIB-4 score in young healthy adults and its association with end stage liver disease: a nationwide retrospective study

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Objectives: Steatotic liver disease (LD) is highly prevalent and underdiagnosed among young adults, with or without metabolic syndrome. This study assessed whether FIB-4 scores in young adults are associated with incident end stage liver disease.
Methods: This retrospective study was conducted using a nationwide community and hospital database. Included were young adults, ages 18-40, with a FIB-4 score calculated during 2005–2020. People diagnosed with liver metastasis or chronic LD, other than metabolic dysfunction-associated steatotic LD, before or during the study, were excluded. The primary outcome was the first diagnosis of cirrhosis, cirrhosis-related complications, or hepatocellular carcinoma. Cox proportional models were applied, with FIB-4 score categorized by percentiles.
Results: A total of 950,141 were included in the study cohort, with a mean age of 29.9 ± 0.5 years, and a median follow-up of 12.8 years (IQR 9.3-14.8). There were 430 incident cases of end stage liver disease in 11,057,421 person-years. The mean age at diagnosis was 30.0 ± 5.3 years. After adjusting for multiple confounders, people with FIB-4 in the 75th–94th, 95th–98th and ≥ 99th percentiles were 35%, 140% and 760% more likely to develop

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end stage LD, respectively, compared to people with FIB-4 score in the 5th–49th percentiles (p<0.03 for all). Each point of FIB-4 score was associated with a 2.2-fold greater risk of incident end stage LD (adjusted hazard ratio= 2.21 (95% CI 1.91-2.56, p<0.001).
Conclusions: FIB-4 score is associated with increased risk for end stage LD in young healthy adults.

PO2.033

Mental and Physical Health Burden in Women with Lipedema: Depression and Quality of Life Among Czech Women

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Background: Lipedema is a chronic condition characterized by excessive fat deposition in the hips, buttocks, and lower legs, significantly impacting quality of life. In Czechia, limited research exists on the relationship between lipedema symptoms and depression, despite the condition's prevalence and its impact on mental health.
Aim: This study aims to investigate the relationship between lipedema symptoms and depression severity among Czech women and assess their quality of life.
Methods: We administered an online survey to 43 women with lipedema. Participants completed questionnaires on quality of life (WHOQOL-BREF), sociodemographic and clinical characteristics, and depression severity, evaluated using the PHQ-9 tool. Statistical analyses included Pearson and Spearman correlations to explore relationships between depression and lipedema symptoms.
Results: PHQ-9 results showed that 50.9% of participants exhibited moderate to severe depression. Quality of life ratings varied, with 27.9% of participants rating their health as poor or very poor. Significant correlations were found between lipedema symptoms, such as shortness of breath, muscle stiffness, and depression severity, indicating a complex relationship between physical symptoms and mental health.
Conclusion: These findings highlight the significant mental health burden faced by individuals with lipedema. The association between physical symptoms and depression emphasizes the need for comprehensive, tailored interventions, especially integrated mental and physical healthcare approaches, aimed at improving overall well-being in this population.

PO2.034

Evaluation of Compliance with Nutritional Recommendations and Sustainable Eating Behaviors in Patients with Heart Failure

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Introduction: Monitoring the nutritional status and preventing malnutrition in patients with heart failure is crucial for the prognosis of the disease. The Mediterranean diet and the DASH diet are two of the most researched diets that help protect heart health. Most of the diets applicable to heart diseases also fall within sustainable nutrition models. Sustainable nutrition is defined as a type of nutrition that focuses on environmentally friendly, socially responsible, and economically feasible food production systems. The aim of this study is to evaluate the compliance of heart failure patients with nutrition recommendations for heart failure and sustainable nutrition behaviors.
Methods: This descriptive-cross-sectional study was conducted face-to-face with patients hospitalized for heart failure at Başakşehir Çam and Sakura City Hospital between April 20, 2024, and December 20, 2024. Within the scope of the study, the sociodemographic characteristics, body weights, and heights of the patients were recorded, followed by the administration of the Nutrition Behavior Scale for Heart Failure (NBSHF) and the Sustainable Nutrition Behavior Scale (SNBS). All statistical analyses were performed with a 95% confidence interval, and statistical significance was set at p<0.05.
Results: The study included a total of 37 heart failure patients, 56.8% of whom were male. The mean age of the patients was 66.14±12.41 years, and the mean BMI was 27.81±5.05 kg/m^2. Although the average body weight of female was lower than that of male, there was no significant difference in BMI between the sexes (p>0.05). No significant relationship was found between the patients' BMIs and their NBSHF and SNBS scores (p>0.05). The lowest possible score on the NBSHF is 19, and the highest is 76. A higher score on the scale indicates better compliance with the heart failure nutrition guidelines, while a lower score indicates poorer compliance. In this study, the average nutrition behavior score did not show a statistically significant difference between genders; it was 53.00±4.41 for female and 50.52±5.75 for male(p>0.05). The SNBS consists of four sub-dimensions: food preference, reducing food waste, seasonal and local eating, and food purchasing. The lowest possible score on the scale is 29, and the highest is 145. A higher total score and higher subdimension scores

Tab. 1.

Table 1. Variables by gender

	Female(n=16)		Male(n=21)		Total(n=37)		
	x̄	SD	x̄	SD	x̄	SD	p
Age	65.13	13.13	66.91	12.11	66.14	12.41	0.782
Body weight (kg)	69.99	18.56	82.94	11.03	77.34	15.92	**0.013**
Body Mass Index (kg/m^2)	27.33	6.84	28.18	3.23	27.81	5.048	0.646
SEBS	92.00	11.13	82.23	11.44	86.46	12.18	**0.013**
Food Preference	3.81	0.49	3.14	0.60	3.42	0.64	**0.002**
Reducing Food Waste	3.43	0.79	2.85	0.52	3.09	0.70	**0.026**
Seasonal And Local Eating	3.35	0.40	3.38	0.61	3.37	0.52	0.951
Food Purchasing	1.91	0.73	1.80	0.73	1.85	0.71	0.567
NBSHF	53.00	4.41	50.52	5.75	51.60	5.29	0.132

Mann–Whitney U test, P<0,05; SEBS='Sustainable Eating Behavior Scale; NBSHF= Nutrition Behavior Scale in Heart Failure

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indicate greater sustainable nutrition behaviors. The average SNBS score of the patients was 86.46±12.18, and this score was significantly higher in female than in male(p=0.013). Additionally, female had significantly higher scores in the subdimensions of food preference and reducing food waste compared to male(p=0.002 and p=0.026, respectively).
Conclusion: Regardless of their BMI, patients exhibited moderate compliance with nutrition recommendations and sustainable nutrition behaviors. It was found that male had lower sustainable nutrition behaviors compared to female. In this context, further efforts are needed to improve patients' compliance with nutrition recommendations and sustainable nutrition behaviors.

PO2.035

Insights from the ELPA European Liver Screening Week 2024

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Background and Aims: The EU faces a growing rise in MASL and MASH, conditions characterised by the accumulation of excess fat in liver cells. They are linked to obesity and a heightened risk of liver cancer. This project aimed to raise awareness of early liver disease detection using portable transient elastography (TE) in community settings.
Method: In October 2024, ELPA Members Liver4Life and SOS Hépatite testing vans offered TE scans to European Parliament staff and the public over 5 days. ELPA representatives engaged MEPs and sent invitations to promote the event. The vans were outside the main entrance with specific messaging placed on the vans. The TE devices were managed by trained operators, including some Belgian HCPs. A brief intervention on lifestyle was used when a high Controlled Attenuation Parameter (CAP) reading was identified. The same was used if a high stiffness reading was identified paired with a self-referral letter for medical follow-up. Participants also completed an anonymous questionnaire assessing iver health.
Results: The total number of completed and recorded TE examinations over the 5 days was 309 paired with the same number of questionnaires. These were all adults: 165 men and 144 women. Of the total examinations, 30 people (9.7%) had stiffness readings in excess of 7.1Kpa, and these people were given self-referral letters after brief intervention advice. The highest stiffness reading over the 5 days was 12.4 Kpa. The study also identified 67 people (22%) with a CAP reading of 275 or higher (UK criteria) and 181 people (59%) with a CAP reading of 225 or higher (Belgium criteria). Everyone with a CAP score of 225 or greater was given brief intervention lifestyle advice.
The average age of people who completed the examinations was 44.8 years old. The average weight was 74.8 kg, height was 169.2 cm, and BMI was 26.1. 40 people had a BMI higher than 30 (9.7%).
99 people (32%) stated that they were worried their liver could be damaged, and the main reasons given were: 55 (17.7%) overweight, 50 (16.1%) thought they drank too much, and 23 (7.4%) thought they may have an auto-immune condition. There was no option to select more than a single primary reason.
38 people (12.3%) stated that they drank alcohol on 4 or more days per week, 47 people (15.2%) reported high blood pressure, and 75 people (24.2%) reported a stress level of 7 out of 10 or higher, and 77 people (24.9%) had relied on substances (alcohol, caffeine or medication) to manage their stress level.
Conclusion: This year's larger cohort showed similar results to last year, with more people than expected having raised CAP readings under both criteria. The lack of agreement on criteria may lead to differing care for similar patients. Most with high CAP readings were unaware they had fat in the liver, though many suspected it due to their lifestyles but hesitated to see the results. These findings highlight the urgent need for public health action to raise awareness.

PO2.036

Exploring associations among timing of food intake, body composition and eating behaviour traits

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Introduction: The impact of the timing of food intake on eating behaviour and obesity continues to garner interest. However, differences in defining and operationalising food intake timing might be contributing to inconsistencies in the literature. The aims of this study were two-fold: 1) to collate the various metrics of food intake/meal timing; and 2) to explore associations of food intake timing parameters with body composition and a range of eating behaviour traits (EBTs), and if EBTs mediate the relationship between food intake timing and adiposity.
Methods: Eleven different food intake timing operationalisations were identified. From these, nine parameters were calculated from the average of 7-day online food diaries in 92 women (age = 35 ± 10 y; BMI = 25.5 ± 4.2 kg/m^2). Parameters included: 1) timing of the largest meal of the day; 2) timing of the greatest percentage total daily energy intake (%TEI); 3) timing of dinner relative to the midpoint of sleep; 4) duration of the eating window; 5) midpoint of the eating window; 6) %TEI after 5pm; 7) %TEI after 8pm; 8) %TEI within 2 hours of waking up (%TEI-Morning); and 9) %TEI within 2 hours of bedtime. Participants' body fat percentage was measured via BodPod. Self-reported bedtime and wake up times were obtained from the Pittsburgh Sleep Quality Index, and EBTs were assessed with the Control of Eating Questionnaire, Three-Factor Eating Questionnaire (TFEQ), Binge Eating Scale (BES), Power of Food Scale, Mindfulness Eating Questionnaire (MEQ) and Intuitive Eating Scale-2 (IES-2). Pearson's bivariate correlations and PROCESS macro were used for correlation and mediation analyses, respectively.
Results: The only food intake timing parameter associated with body fat percentage was %TEI-Morning (r = -.238, p =.022). As for EBTs, %TEI-Morning was correlated with TFEQ-Disinhibition (r = -.350, p =.001), BES (r = -.340, p =.001), MEQ-Summary (r =.312, p =.003) and IES-2-Total (r =.278, p =.01). The timing of the largest meal of the day and of the greatest %TEI were negatively correlated with MEQ-Summary (r = -.265, p =.013 and r = -.210, p =.049). No other correlations were significant. Mediation analyses revealed that TFEQ-Disinhibition, BES, MEQ-Summary and IES-2-Total individually mediated the association between %TEI-Morning and body fat percentage, of which BES was the strongest mediator.
Conclusion: Operationalising food intake timing according to typical wake up time rather than bedtime or other approaches appears to be more strongly and consistently associated with adiposity and EBTs. Within our sample of women, the inverse association between %TEI within 2 hours of waking up and body fat percentage was mediated by EBTs linked to overconsumption, notably binge eating.

Conflict of Interest: None disclosed.

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PO2.037

Body mass index as a long-term risk factor for severe COVID-19 requiring intensive care

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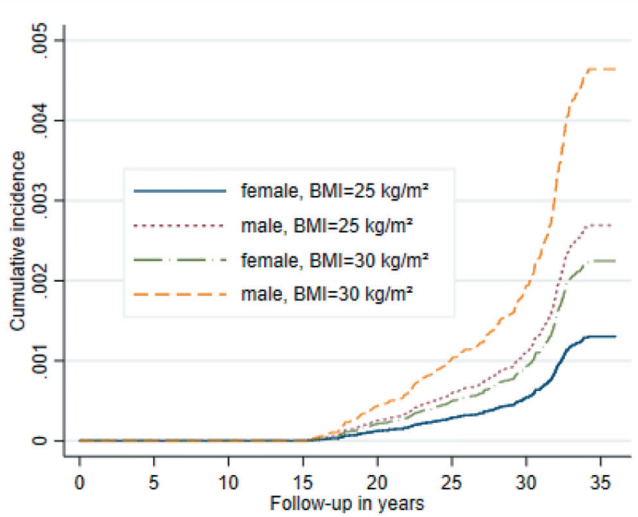
Introduction: Cohort studies examining the long-term association between body mass index (BMI) and severe COVID-19 outcomes remain sparse. Few large-scale studies have provided pre-pandemic baseline measurements linked to subsequent COVID-19 outcomes in healthy individuals. This study investigates the association of BMI with the risk of

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COVID-19 outcomes requiring intensive care unit (ICU) admission over a 30-year follow-up period.
Methods: Data were derived from the Vorarlberg Health Monitoring and Prevention Programme (VHM&PP) cohort, which comprised 177,384 participants who underwent standardised health examinations between 1988 and 2005. At baseline, trained health professionals measured height and weight, and fasting blood samples were collected. After a median follow-up of 30 years, 227 participants required ICU admission at the State Hospital Feldkirch and other intensive care units across Vorarlberg, Western Austria due to severe COVID-19 between 2020 and 2022. As 45,971 participants died during follow-up, competing risk analysis was used to estimate the subdistribution hazard ratios (SHRs) per unit increase in BMI (kg/m²), with death as the competing event, adjusting for age, sex, and smoking status.
Results: At baseline, participants had a median age of 42 years, and 54% were female. Participants who later required ICU admission for COVID-19 had a higher mean BMI than those who did not (27.2 ± 4.9 vs. 24.9 ± 4.3 kg/m²). At ICU admission, patients were on average 70 years old, and 65% were male. The adjusted SHR for ICU admission was 1.12 per kg/m², 95%CI: 1.09-1.14, indicating a statistically significant positive association between BMI and the risk of ICU admission. Among the covariates, male sex in particular was associated with a higher risk of ICU admission (SHR 2.07, 95%CI: 1.56-2.75). BMI showed a stronger association in females (SHR 1.14 per kg/m², 95%CI: 1.11-1.16) compared to males (SHR 1.09 per kg/m², 95%CI: 1.05-1.12) with a significant interaction between sex and BMI (p=0.029). The association between BMI and ICU admission remained almost unchanged after additional adjustment for blood pressure, fasting glucose, triglycerides and cholesterol. Figure 1 illustrates the incidence of ICU admission, stratified by sex, at selected body mass indices (BMI) of 25 kg/m² and 30 kg/m².
Conclusion: Higher BMI in middle-aged adults was independently associated with an increased risk of severe COVID-19 requiring intensive care, even after 30 years of follow-up. These findings add to the evidence that obesity itself contributes to the risk of severe COVID-19 and highlight the lasting health consequences of elevated bodyweight over the long term.

Reference

Ulmer H, Kelleher C, Diem G, Concin H. Long-term tracking of cardiovascular risk factors among men and women in a large population-based health system: the Vorarlberg Health Monitoring & Promotion Programme. European Heart Journal. 2003 Jun;24(11):1004-13.



Estimates for cumulative incidence of ICU admission due to severe COVID-19 from a competing risk model accounting for death as competing event with predictors BMI, sex, age and smoking status. Results shown for both sexes at BMI=25 kg/m² and BMI=30 kg/m².

Fig. 1. Cumulative incidence of severe COVID-19 requiring intensive care.

PO2.038

Meal timing and risk of metabolic syndrome in the French NutriNet-Santé cohort

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Background: Circadian rhythm disruption has been associated with higher risks of cardiometabolic diseases and several cancers. Mistimed eating patterns can desynchronize circadian rhythms, and could therefore influence metabolic health. However, long-term associations between meal timing and the metabolic syndrome remain unclear. The aim of this study was to evaluate the association between meal timing 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: the first was characterized by frequent eating and late snacking, the second was characterized by late first meals with energy/nutrient-dense last meals, and the third was characterized energy/nutrient-dense first meals. In men, a higher adherence to the first profile was associated with a higher risk of MetS (RR = 1.07, 95% CI: 1.01-1.14), but the association was attenuated after adjusting for overall diet quality (RR = 1.05, 95% CI: 0.99-1.12). Also in men, a higher adherence to the third profile was associated with a lower 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 lower risk of MetS. The link between time of meal timing and MetS seems to be parlty explained by diet quality. Further investigations with a longer follow-up are needed to elucidate how meal timing influences metabolic health.

PO2.039

Differences in eating patterns in autistic vs non-autistic population

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Introduction: Eating disorders (EDs) are characterized by disruptive eating behaviours that interfere with food consumption, negatively impacting psychological and social functioning as well as physical health (American Psychiatrist Association [APA], 2022). Recently, the prevalence of these disorders has increased (Cano et al., 2022). In recent years, there has been a growing interest in studying the connection between autism and eating

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disorders. Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that mainly entails communication and social difficulties, together with restrictive and repetitive interests and behaviours (APA, 2022). Most of the research in the field of autism and eating disorders has focused on anorexia and bulimia (Adams et al., 2024). Because of this, there is little evidence that supports a significant relationship between autism and different eating patterns, for example, the relationship between autism and emotional eating (Wallace et al., 2020). Some studies have highlighted the presence of emotional eating in the autistic population (Van 't Hof et al., 2019; Wallace et al., 2020). However, this has not been extensively studied (Wallace et al., 2020).

Taking into account the current state of knowledge in the field, the purpose of this study is to explore the relationship between autism and different eating patterns, with a special focus on emotional eating.

Methods: A total of 150 participants completed an online questionnaire, which included the Dutch Eating Behaviours Questionnaire (DEBQ) and the 10-item version of the Autism Quotient (AQ-10). The former evaluates different types of eating behaviours: emotional eating, external eating, and restrictive eating. The latter serves as a screening tool for autism, primarily assessing autistic traits. A series of Pearson's Correlations tests were performed to study the possible correlation between autistic traits and the different subscales of the DEBQ.

Results: Results indicated a significant positive correlation between AQ-10 scores and emotional eating ($r = 0.225$, $p < 0.01$), as well as AQ-10 scores and external eating ($r = 0.160$, $p < 0.05$). However, no significant correlation was found between AQ-10 scores and restrictive eating ($r = 0.081$, $p > 0.05$). These results suggest a one-tailed positive correlation, where higher AQ-10 scores are associated with higher scores in emotional and external eating.

Conclusion: In conclusion, autistic people or people with higher autistic traits are more likely to experience emotional an external eating. This tendency, especially in regards to emotional eating, could explain the prevalence of autism in the population with binge eating disorder (Numata et al., 2021). However, further research is essential to uncover the underlying causes and develop intervention that address the needs of the autistic population. Future studies would benefit from including participants with a former diagnosis rather than using screening tools like AQ-10, which only evaluates autistic traits.

Conflict of Interest: None Disclosed

Funding: No funding to report

Tab. 1. Pearson's Correlation between AQ-10 and the DEBQ's subscales.

Variable	1	2	3	4
1. AQ-10	1			
2. DEBQEME	0.225**	1		
3. DEBQEXE	0.160*	0.552***	1	
4. DEBQRE	0.081	0.349***	0.203**	1

Pearson's Correlation between AQ-10 and the DEBQ's subscales. Note. All of the tests are unilateral for positive correlations. *p <.05, **p <.01, ***p <.001. DEBQEME = DEBQ Subscale for Emotional Eating; DEBQEXE = DEBQ Subscale for External Eating; DEBQRE = DEBQ Subscale for Restrictive Eating

PO2.040

Consumption of ultra-processed foods, adherence to the Mediterranean diet and renal function in people with overweight and obesity

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Introduction: Chronic Kidney Disease (CKD) is a condition marked by a gradual decline in kidney function. Over the past two decades, CKD prevalence has risen globally, largely due to the epidemic of overweight and obesity. Diet is a potential factor in kidney health. While evidence is limited, some studies link ultra-processed foods (UPFs) to CKD onset, whereas others highlight protective effects of the Mediterranean Diet (MedDiet). It remains unclear if diet influences renal function in individuals with excess weight, independent of other risk factors. This study aimed to examine the relationship between UPF consumption, MedDiet adherence, and renal function in people with overweight and obesity, accounting for potential confounders.

Methods: We conducted a cross-sectional study involving 77 participants with overweight and obesity (65.79% female, mean age: 47 ± 14 years, mean BMI: 30.0 ± 4.7 kg/m²) recruited from the Istituto Auxologico Italiano and the International Center for the Assessment of Nutritional Status (ICANS, University of Milan). Data regarding socio-demographic characteristics, medical history, chronic medication use, and lifestyle habits, including physical activity and smoking status, were collected. Anthropometric measurements (weight, height, waist circumference, and skinfold thickness) and blood pressure were taken. Blood samples were collected to measure creatinine levels and calculate the estimated glomerular filtration rate (eGFR) using the CKD-EPI formula. Additionally, each participant completed a 24-hour urine collection to measure creatinine clearance, albuminuria, and proteinuria levels. Finally, all participants completed validated questionnaires, including the 14-item Mediterranean Diet Adherence Screener (MEDAS) to assess adherence to the Mediterranean diet, and the NOVA Food Frequency Questionnaire (NFFQ) to quantify the UPF consumption.

Results: UPF accounted for 17.0%±8.8 of the total daily food intake, while the Mediterranean Diet score was 7±2. A total of 44% of participants exhibited a mild to moderate reduction in eGFR (eGFR<90 mL/min/1.73m²), and 10% had albuminuria levels >30 mg per 24 hours. Multivariate linear regression models adjusted for sex, age, BMI, body fat percentage, waist circumference, systolic and diastolic blood pressure, physical activity, and smoking status showed no significant association between UPF consumption and creatinine clearance (β=0.31, 95%CI:-0.78,1.41), eGFR (β=0.18, 95%CI:-0.77,0.40), proteinuria (β=-0.0008, 95%CI:-0.0041,0.0025), or albuminuria (β=-0.11, 95%CI:-1.57,1.36). Similarly, no significant associations were observed between adherence to the Mediterranean Diet and creatinine clearance (β=-2.76, 95%CI:-8.75,3.22), eGFR (β=1.14, 95%CI:-1.18,3.45), proteinuria (β=0.08, 95% CI:-0.01,0.27), or albuminuria (β=-1.40, 95%CI:-6.52,9.33).

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Conclusion: The consumption of ultra-processed foods and adherence to the Mediterranean Diet are not associated with renal function in individuals with overweight and obesity. However, further research is warranted to validate these findings.

PO2.041

Systematic Literacy Review on the Awareness of Obesity in Adults and Children living with Obesity, the General Public and Healthcare Professionals

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Introduction: Awareness of obesity's causes and risks remains limited, affecting management and support efforts. This review evaluates evidence on obesity awareness across adults and children living with obesity, the general public and healthcare professionals.
Methods: A systematic literature search was conducted across three electronic databases: PubMed, Embase, and Web of Science Core Collection, from inception until November 19, 2023. Studies were included if they met the following criteria: 1) children or adults living with overweight or obesity, 2) healthcare providers, 3) general public, and 4) assessed awareness of obesity as a disease, including its complications, causes, and symptoms, using either qualitative or quantitative research methods. Meta-analyses were conducted using the Metafor package in R.
Results: In total, 49 out of 14871 unique records could be included. Meta-analysis revealed that a mean proportion of 83% [0.70, 0.96] of healthcare professionals viewed obesity as a disease, compared to 0.77 [0.65, 0.90] of adults living with obesity and 70% [0.50, 0.90] of the general public. Cardiovascular diseases (0.83 [0.68–0.98]) and type 2 diabetes (0.81 [0.67–0.95]) were the most commonly recognised complications of obesity, whereas the increased risk of developing cancer due to obesity was less frequently acknowledged (0.34 [0.25-0.44]). Few studies have explored awareness of mental illness as a complication of obesity. Lack of physical activity (0.82 [0.78–0.87]) and excessive or unhealthy food intake (0.76 [0.65–0.87]) were identified as the leading perceived causes. Only 49% (CI: [0.35-0.63]) acknowledged the role of genetic factors in contributing to obesity.
Conclusion: Although healthcare professionals were more likely to perceive obesity as a disease compared to the general public, significant awareness gaps persisted across all groups regarding its causes, and complications. To bridge these gaps, future interventions focusing on knowledge and awareness concerning obesity should prioritise educating people on the pathophysiology of obesity, as well as the extensive range of its symptoms and complications.

PO2.042

"Our healthcare system is just reactive": Needs and challenges of the payor and regulatory community towards integrating obesity into a chronic care framework

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Introduction: Obesity acts as the gateway disease to all Non-Communicable Diseases (NCDs). As the impact of NCDs continues to increase, projected to exceed 70% of global mortality, there is an urgent need to improve the management of people living with obesity. People involved with health care policy must address the social and economic challenges that will likely develop as a result of the rise and severity in obesity. Therefore, we aimed to explore in the payors and regulatory community across Europe their needs and challenges to implement obesity in a chronic care framework.
Methods: In this cross-sectional qualitative study, payors and regulators from various European countries were invited by purposive sampling between 14th of October, 2023, and 15th of March, 2024, to participate. Payors and regulators were interviewed, and data were transcribed and analysed using thematic analysis.
Results: A total of 9 payors and 6 regulators were interviewed coming from 11 different European countries. Four themes (Structure of the healthcare system, political challenges, obesity perceptions, obesity treatment and management) were identified wherein challenges were mentioned for obesity. Payors and regulators emphasised the need for a proactive healthcare model ("But ultimately we only look at what does it cost? We never look at what does it ultimately bring in, or where do we gain the most efficiency?" Participant 5) recognition of obesity as a policy-prioritised NCD ("As long as you don't define it as an NCD. You would have some risk of severe stigma that would lead to this being individualised and seen as something that people could sort of solve themselves." Participant 1), the integration of obesity care pathways and health promotion centres ("Lack of overall treatment guidelines" Participant 7), and the registration of obesity in all care settings ("We don't have data, we don't know how to make a reasonable strategy, measure, evaluate, manage." Participant 2).
Conclusion: The payor and regulatory community advocated for a proactive approach to obesity, focusing on preventive interventions to mitigate the costs and health complications associated with NCDs.

PO2.043

A Mixed-Methods Blueprint for Obesity Healthcare Policy: From Research to Action

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Objectives: To reform health systems and improve health outcomes for individuals living with obesity, there is a critical need to enhance and implement effective obesity healthcare policies. This research, driven

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Tab. 1. Action points ranked in Rescaled Probability Scores.

Policy recommendations	Internal (IMI SOPHIA, RPS ; (95% CI))	External (ECO (RPS; (95% CI))
Total	37	203
Access to obesity treatment should be guaranteed regardless of socio-economic background.	23.3; (20.5 – 26.1)	18.9; (17.9 – 20.0)
Spread awareness that obesity is a disease requiring treatment beyond individual efforts, and emphasising on the importance of collaboration with healthcare professionals (HCPs) for effective treatment & management.	15.7; (13.2 – 18.1)	16.7; (15.7 – 17.6)
Obesity needs to be accepted as a chronic disease in the disease nomenclature (ICD) of the healthcare system.	15.3; (11.7 – 19.0)	13.1; (12.1 – 14.2)
Continuous education on treating and managing obesity for healthcare professionals (HCPs).	8.5; (6.7 – 10.3)	11.0; (10.2 – 11.7)
Obesity management drugs should be prioritized to the same degree as treatments for other chronic diseases.	7.2; (4.6 – 9.8)	11.0; (9.8 – 12.2)
The creation of a global standardised obesity care pathway for all patients living with obesity.	9.6; (6.9 – 12.3)	7.9; (6.8 – 8.9)
Improved awareness concerning obesity and its diverse subtypes, should be disseminated throughout society.	8.0; (6.1 – 9.9)	7.3; (6.6 – 8.1)
The need for improved tools that assists healthcare professionals (HCPs) in effectively phenotyping obesity subtypes.	6.0; (4.1 – 8.0)	6.9; (6.0 – 7.7)
Aside of routinely collected anthropometric measurements, novel biomarkers should be evaluated to assist in diagnosis a patient with obesity.	3.3; (2.1 – 4.4)	3.9; (3.1 – 4.6)
Anthropometric measurements in combination with biomarkers should be routinely collected and sent to a federated database to improve accurate diagnosis of patients with obesity.	3.1; (1.6 – 4.6)	3.4; (2.7 – 4.2)

Innovative medicine agency Stratification of Obesity Phenotypes to Optimize Future Therapy (IMI SOPHIA); European Congress on Obesity (ECO); Rescaled Probability Scores (RPS), 95% Confidence interval (CI)

The following 10 action points (table 1) listed from most impactful to least impactful by the obesity community can be used by policymakers to identify which policy recommendations should be advocated for in the upcoming mandate.

by the IMI-SOPHIA (Innovative Medicines Initiative - Stratification of Obesity Phenotypes to Optimise Future Obesity Therapy) consortium, aimed to co-create impactful action points to improve obesity healthcare delivery.

Methods: In this study, a mixed-method research approach with an exploratory sequential design was utilised. Online focus groups consisting of IMI-SOPHIA researchers were conducted to develop action points addressing the needs and challenges of obesity in the healthcare system. Qualitative data from the focus groups were analysed using thematic analysis. To determine the relative importance of each action point, Maximum Difference Scaling surveys were administered for internal validation within the IMI-SOPHIA consortium and for external validation to participants at the European Congress on Obesity 2024. Hierarchical Bayes estimation was used to compute mean Rescaled Probability Scores (RPS; 0-100) of each action point from the survey responses.

Results: Three focus groups (n=30) were conducted, and thematic analysis identified 10 action points grouped into four overarching themes: obesity screening and early diagnosis, obesity treatment and management, obesity perceptions, and the structure of our obesity healthcare system. The internal validation survey involved 37 participants from 12 countries, whereas the external validation survey included 203 participants from 34 countries. From both internal and external validation, the action point perceived as most impactful was "Access to obesity treatment should be guaranteed regardless of socio-economic background" (RPS internal = 23.3, CI 20.5 – 26.1; RPS external = 18.9, CI 17.9 – 20.0).

Conclusion: The following 10 action points (table 1) listed from most impactful to least impactful by the obesity community can be used by policymakers to identify which policy recommendations should be advocated for in the upcoming mandate.

PO2.044

Improving Quality of Childbirth Care for Women with Obesity in a Stigma-Free Care Environment

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Introduction: Women with obesity are at increased risk of complications during pregnancy and childbirth. Beyond physiological and hormonal factors, psychosocial aspects significantly contribute to the association between obesity and adverse birth outcomes. We aimed to identify

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psychosocial factors, such as weight-related stigmatization during childbirth, hypothesizing that weight stigma affects birth experience and outcomes, particularly cesarean birth (CB). This study provides insights into how healthcare professionals can better support women with obesity (pre-pregnancy body mass index (BMI) ≥ 30 kg/m2) during childbirth and examines how weight stigmatization complicates their care.

Methods: We retrospectively analyzed data from a Swiss cohort of 394'812 women who gave birth between 2005 and 2020. A nationwide cross-sectional online survey was conducted from August to November 2023 in Switzerland to assess birth experiences, perceived weight stigma, and birth outcomes from women who delivered their last child in the previous five years. Pearson correlations were used to examine relationships between weight stigma and birth experiences. The associations between weight stigma and CB were analyzed in relation to pre-pregnancy BMI using logistic regression and mediation analysis.

Results: Women with obesity had a higher CB rate (39.36%) compared to women without obesity (24.12%). Clinical and psychosocial mediating factors influenced CB outcomes and birth experiences. Of the 1352 women who completed the survey, weight stigma was more prevalent among women with obesity (36.3%) than among women without obesity (7.7%). In women with obesity increased frequency of experiencing weight stigma correlated with less positive emotional birth experiences (r, -0.35; $P < 0.05$) and decreased participation during childbirth (r; -0.32 $p < 0.05$). Weight stigma increased the odds of CB (aOR, 1.08; 95% CI, 1.02,1.15; $P < 0.05$) and partially mediated the relationship between BMI and CB (b, 0.07; SE, 0.029; $P < 0.05$).

Conclusion: These findings highlight the significant impact of weight stigma on childbirth experiences and CB outcomes among women with obesity. Addressing weight stigma through the sensibilization of healthcare providers, integrating weight stigma awareness into obesity care guidelines, and implementing supportive care models may be pivotal in improving childbirth experiences, and reducing CB rates for women with obesity.

Conflict of Interest: None Disclosed

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PO2.045

"Healthcare providers can't do everything, they can give advice and follow-up, but they can't force people to follow a certain lifestyle": Awareness of Obesity Among Patients

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Introduction: Improving public awareness of obesity, its causes, and its associated risks could play a key role in promoting help seeking behaviour, help breaking stigma and promote interaction between patients with obesity (PwO) and their healthcare provider. Our aim was to explore the level of awareness regarding obesity among PwO. Additionally, recognizing the impact of cultural factors on obesity awareness, we included a separate group of PwO with an Arabic background for evaluation.

Methods: In this cross-sectional qualitative study, consecutive patients visiting the obesity clinic of the University Hospitals of Brussels between December, 2023, and May, 2024, were invited to participate. A subset of patients was invited to participate through purposive sampling to ensure that a portion of the participants had an Arabic background. PwO were interviewed, and data were transcribed and analysed using thematic analysis. The first section of the semi-structured interview guide focused on participants' perceptions of obesity as a disease. The second section explored the perceived causes of obesity and the medical interventions considered necessary for treating PwO.

Results: A total of 30 PwO (15 of Arabic background and 15 of other backgrounds) were interviewed. This study revealed contrasting views on whether obesity should be classified as a disease between patients. Patients who opposed the recognition of obesity as a disease predominantly attributed obesity to an imbalance between food intake and physical activity, emphasizing personal responsibility as the central factor. They often advocated for lifestyle changes as the sole form of medical support. In contrast, those who supported recognizing obesity as a disease underscored the role of biological factors, as critical contributors to its development. They emphasized the necessity of a multidisciplinary treatment approach, involving general practitioners, dieticians, physiotherapists, and psychologists, and noted that current treatments are sometimes not effective. All patients acknowledged the broad spectrum of obesity-related consequences, encompassing health, physical, psychological, and socio-economic challenges. No differences concerning obesity awareness were found between PwO with or without an Arabic background.

Conclusion: This study identified key knowledge gaps that can inform future obesity awareness campaigns. Health interventions should highlight the biological onset of obesity. Additionally, such interventions should emphasize the role of multidisciplinary care, including pharmacotherapy, which can interplay with the neurometabolic nature of this disease.

PO2.046

Exploring the associations between personality traits and food cravings in adults

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Introduction: Recent studies have shown that personality traits can influence individuals' food choices. These traits appear to be associated with eating behaviours in response to negative mood, stress, and environmental cues. This study aimed to investigate the relationship between personality traits and food cravings in general, as well as cravings for specific food categories (sweet and savory).

Methods: To date, 27 adults aged between 18 and 40 years have participated in the study. This study was approved by the Unicamp Ethical Committee (CAAE: 40026320.3.0000.5404) and participants gave informed consent. They completed the Control of Eating Questionnaire (CoEQ), which assesses the frequency, intensity, specificity, and associated behaviours of food cravings, as well as a socioeconomic form. Body composition was analyzed using BIA (InBody 270, Biospace, California, USA) and the NEO-Five Factor Inventory (NEO-FFI) was used to evaluate personality across five major dimensions: Neuroticism, Extraversion, Agreeableness, Openness to Experience and Conscientiousness. Data was analyzed using JASP 0.18.3.0 and statistical significance was set at $p<0.05$. Descriptive analyses were performed, as well as correlations between the variables using Pearson's correlation.

Results: Characteristics of the sample can be seen in table 1. The mean scores of the five personality traits showed that women scored higher in Openness to Experience (59.3 ± 10.6 *vs* 49.6 ± 10.6; $p<0.05$) and Conscientiousness (43.3 ± 4.5 *vs* 34.5 ± 10.5; $p<0.05$). Overall, the sample exhibited a high level of Neuroticism (62.4 ± 10.9), with no significant differences between men and women. No sex differences were found in the CoEQ domains (Craving Control, Craving for Sweets, and Craving for Savory foods). In the total sample, Pearson's correlation showed a positive correlation between the Neuroticism personality trait and the difficulty

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in controlling general food cravings (craving control) (r=0.523; p=0.010), as well as craving for sweets (r=0.432; p=0.040). A negative correlation was observed between Neuroticism and the Positive Mood domain of the CoEQ (r=-0.415; p=0.049). Lastly, the craving control domain was positively correlated with body fat (%) (r=0,414; p=0.032) and negatively correlated with muscle mass (%) (r=-0,414; p=0,032).
Conclusion: The results suggest that personality traits are linked to eating behaviour, with Neuroticism in particular being associated with increased difficulty in controlling cravings in general and cravings for sweets. This finding underscores the importance of health strategies that consider the impact of personality on individuals' eating behaviour. A multidisciplinary approach is essential to understand, prevent and treat disordered eating and weight management.

Tab. 1. Characteristics of the sample.

	Mean ± SD
Age (years)	26.44 ± 7.6
Body Mass (kg)	76.06 ± 20.82
Stature (m)	1.71 ± 0.11
BMI (kg/m2)	25.75 ± 5.52
Bod Fat (%)	26.04 ± 10.17
Muscle Mass (%)	73.96 ± 10.17
	Frequence (%)
Male	62.96
Female	37.04

PO2.047

Investigating the interplay between menstrual cycle, mood states, and psychological eating behaviour traits in adult women

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Introduction: The role of ovarian hormones in female physiology, including the organization of brain structures such as the hippocampus and amygdala — areas involved in emotional processing — is well established. Similarly, the regulation of food intake is influenced not only by homeostatic mechanisms, mediated by hormones like leptin, ghrelin, and insulin, but also by non-homeostatic mechanisms, which rely on the same brain structures. This underscores the importance of investigating how different phases of the menstrual cycle may relate to eating behaviour and affective factors.
Methods: This was a cross-sectional study with online data collection, involving 302 women with regular natural menstrual cycles. Eating behaviour traits were assessed using the Three Factor Eating Questionnaire (TFEQ-R21), while mood states were measured using the Profile of Mood States (POMS), and a progressive and regressive count to classify participants into four distinct menstrual cycle phases: mid-luteal, perimenstrual, mid-follicular, and periovulatory. Confirmatory Factor Analysis was conducted to ensure the metric quality of the questionnaires. Differences in means between groups were assessed using one-way ANOVA with Bonferroni post-hoc tests. Partial least squares structural equation modeling (PLS-SEM) was employed to investigate determinants of eating behaviour. Statistical significance was set at $p<0.05$. Ethical requirements were met during data collection (CAAE: 71211423.8.0000.5454).
Results: The characteristics of the sample are presented in Table 1. An increase in confusion mood state was observed during the mid-luteal phase ($p = 0.044$) compared to the mid-follicular phase, and during the mid-follicular phase ($p = 0.013$) compared to the periovulatory phase, with a small effect size ($\omega^2 = 0.044$). No significant associations were found between the menstrual cycle and the psychological eating behaviour traits. Tension mood state ($p = 0.022$; $p = 0.029$) and confusion ($p < 0.001$; $p < 0.001$) positively predicted emotional eating and emotional disinhibition, respectively. Anger negatively predicted ($p = 0.050$) emotional eating, vigor positively predicted ($p < 0.001$) cognitive restraint, and BMI positively predicted all three eating behaviour traits ($p < 0.001$).
Conclusion: The findings indicate a small effect size between the menstrual cycle and mood states and no relationship with eating behaviour traits, suggesting that appetite changes during menstrual cycle phases may be related to other factors. Short-term components of eating behaviour are being investigated by our research group as a second phase of this study and may better elucidate differences between the phases of the menstrual cycle. Cultural factors should also be considered in future studies. However, the predictive model contributes to understanding the emotional mechanisms underlying eating behaviour traits and highlights the importance of considering emotional aspects in managing maladaptive eating behaviours. Health strategies should integrate psychological and emotional factors to promote more effective nutritional interventions.

Tab. 1. Characteristics of the sample (n=302).

Variable	n (%)
Age (years old)	
18 a 24	99 (32.78)
25 a 30	131 (43.37)
31 a 55	45 (14.90)
36 a 40	27 (8.94)
Marital status	
Single	242 (80.13)
Married	54 (17.88)
Divorced	6 (1.99)
BMI Classification	
Underweight (<18kg/m^2)	18 (5.96)
Eutrophy (18,5-24,9kg/m^2)	168 (55.63)
Overweight (25-29,9kg/m^2)	64 (21.19)
Obesity (≥30kg/m^2)	51 (16.89)
Missing	1 (0.33)
Education Level	
Completed primary education	2 (0.66)
Incomplete high school	2 (0.66)
Completed high school	18 (5.96)
Incomplete higher education	78 (25.83)
Completed higher education	110 (36.42)
Postgraduate	92 (30.46)

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PO2.048

High fat sweet consumption in group meals may be influenced by the Conscientiousness personality trait

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Introduction: Food consumption, in addition to being partially determined by homeostatic factors, is influenced by external factors such as available resources, social structure, and the food context. Moreover, personality has been studied as one of the determinants of consumption, food choices, and preferences. Therefore, this study aims to investigate ad libitum sweet intake (individual and group), as well as to understand the role of personality traits in these outcomes.
Methods: Twenty-seven adults (26.44 ± 7.6 years old) were included until this moment and ethical requirements were met for data collection (CAAE: 40026320.3.0000.5404). They were in a 4-hour fasted state for two experimental sessions: individual [IN] and group [GR] conditions, when they had a fixed test-meal (lunch) and an ad libitum sweet post-meal (order randomly decided). The fixed test-meal was a savoury lunch (434,37Kcal) familiar to Brazilian culture, and the ad libitum post-meal consisted of grapes and chocolate (bite-sized pieces) served in two different bowls with 400g of each food, approximately. The amount of food eaten on the ad libitum post-meal was undertaken by weighting the food before and after consumption. Participants were instructed to consume as much or less as they wanted. Food reward (wanting and liking for food) was measured using the Leeds Food Preference Questionnaire – BR before and after the fixed test-meal (data not shown) and the NEO-Five Factor Inventory (NEO-FFI) was used to evaluate personality across five major dimensions: Neuroticism, Extraversion, Agreeableness, Openness to Experience and Conscientiousness. Body composition was analyzed using BIA (InBody 270, Biospace, California, USA). Statistical significance was set at $p<0.05$.
Results: The sample (62.96% male) had a mean BMI of 25.75 ± 5.52 kg/m² (range = 18.8 to 39.8 kg/m2). Mean body weight and body fat (%) was 76.6 ± 20.82 kg and 26.04 ± 10.17, respectively. Women had higher scores for Openness to Experience and Conscientiousness (table 1) and men had a greater intake of the ad libitum chocolate in both conditions (table 2). The analysis of repeated measures (ANOVA) demonstrated that consumption of the high fat sweet (chocolate) ad libitum post-meal was different between conditions ([IN]: 48.6 ± 22.4 g, [GR]: 57.6 ± 24.9 g; p=0.013) and that the Conscientiousness personality trait appears to interact with this variance in consumption (p=0.057; [GR]: β=0.26; [IN]: β=0.50).
Conclusion: The results suggest that group meals may facilitate high fat sweet consumption, and that Conscientiousness appears to interact with this result, influencing the amount consumed (higher conscientiousness, lower chocolate consumption). Food consumption appears to be influenced by social interactions but this varies, as it is influenced by individual characteristics. It highlights the importance of weight management strategies that consider multiple interactions. The next steps in this ongoing study aim to increase the sample size to examine the potential differences on food reward between individual and group conditions, and to better elucidate the interaction of personality traits on these results.

PO2.049

Eating behavior of brazilian adults and its associations with dieting and BMI

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Introduction: Advances on the intimate connection between homeostatic and non-homeostatic mechanisms of eating regulation highlight the relevance of sensory, emotional and cognitive factors. It is known that cognitive restraint (CR) (control exerted over food intake in order to influence body weight and/or shape), uncontrolled eating (UE) (general difficulties or loss of control over intake that lead to overeating) and emotional eating (EE) (eating motivated by emotional states) are aspects of eating behavior that can significantly contribute to negative health outcomes. Although dieting is a widely used strategy for weight reduction or control, increasing findings point to its possible paradoxical effects, and little is known about the impact of dieting on specific components of eating behavior, such as CR, UE and EE. This study aimed to identify the levels of CR,

Tab. 1. Personality dimentions of men and women (n=27).

	Men	Women	Total Sample
NEO-FFI			
Neuroticism	60.5 ± 12.0	65.4 ± 8.8	62.4 ± 10.9
Extraversion	52.4 ± 14.0	50.1 ± 9.5	51.5 ± 12.2
Openness	49.6 ± 10.6	59.3 ± 10.6*	53.4 ± 11.4
Agreeableness	39.6 ± 11.0	39.1 ± 10.5	39.4 ± 11.1
Conscientiousness	34.5 ± 10.5	43.3 ± 4.5*	37.9 ± 9.6

Tab. 2. Ad libitum consumption after a savoury lunch in individual and group conditions.

	Individual	Individual	Individual	Group	Group	Group
	Women (n=10)	Men (n=17)	Total Sample (n=27)	Women (n=10)	Men (n=17)	Total Sample (n=27)
Grapes(g)	80.2 ± 26.1	82.7 ± 31.6	81.8 ± 29.2	88.2 ± 17.7	86.9 ± 29.2	87.4 ± 25.2
Chocolate(g)	32.6 ± 16.2	58.2 ± 20.2*	48.6 ± 22.3	35.4 ± 19.3	70,6 ± 17,4*	57.6 ± 24.9*

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UE and EE in Brazilian adults and to evaluate associations between these aspects of eating behavior, dieting and body mass index (BMI).
Methods: Data (CR, UE, EE, current engagement and frequency of dieting, weight and height) from 413 men and women were collected using an online form. CR, UE and EE levels were assessed using the Three Factor Eating Questionnaire (TFEQ-18). Comparisons between groups were assessed using Student's t-test; correlations were assessed using Pearson's r. For all tests, $p < 0.05$ was considered. All procedures were performed after obtaining ethical approval (CAAE: 62848922.7.0000.5404).
Results: The mean body mass index (BMI) ± standard deviation was 24.8 ± 4.86 kg/m2 (range = 16.1 to 54.1 kg/m2). Sociodemographic characteristics are shown in table 1. The average levels of CR (2.40 ± 0.77), UE (2.14 ± 0.57) and EE (2.25 ± 0.87) were low in the total sample. When compared between sexes, although such levels remained low in men, women showed increased CR ($p< 0.001$; d=0.342) and EE ($p< 0.001$; d=0.532), with no differences for UE ($p = 0.920$). 23% (n=95) of participants were dieting at the time the study was conducted. Although 80.1% of them reported to have sometimes, rarely or never dieted, 19.9% are frequently or always on a diet. Individuals on a diet had higher levels of CR ($p<0.001$) and EE (p=0.049), with no differences for UE (p=0.989). Regarding correlations, in addition to the association between current dieting and higher levels of CR (r=0.029; $p<0.001$) and EE (r=0.097; p=0.049), dieting was not associated with higher or lower BMI levels (p=0.154). Higher levels of EE (r=0.238; $p<0.001$), in turn, as well as CR (r=0.143; p=0.004) and UE (r=0.230; $p<0.001$), were associated with higher levels of BMI.
Conclusion: The results show a certain vulnerability of women regarding CR and EE. CR and EE also appear to be vulnerable to individuals' engagement in dieting. Special attention should be given to the possible amplification of such susceptibility in cases of frequent dieting. The associations between dieting and EE and between EE and BMI should be explored regarding the causal relationships implicated in order to inform health strategies and interventions focused on weight loss.

Tab. 1. Sociodemographic characteristics of total sample (n=413).

Variables	n (%)
Age (years old)	
18-30	312 (75.5)
31-40	63 (15.3)
41-50	21 (5.1)
51-60	17 (4.1)
Sex	
Women	205 (49.6)
Men	50.4
Education level	
Incomplete primary education	1 (0.2)
Completed primary education	2 (0.5)
Incomplete high school	3 (0.7)
Completed high school	34 (8.2)
Incomplete higher education	145 (35.1)
Completed higher education	140 (34)
Postgraduate	88 (21.3)
BMI Classification	
Underweight (<18.5 kg/m2)	14 (3.4)
Eutrophy (18.5–24.9 kg/m2)	240 (58.1)
Overweight (25.0–29.9 kg/m2)	111 (26.9)
Obesity (≥30.0 kg/m2)	47 (11.4)
Missing	1 (0.2)

PO2.050

Association between chronic kidney disease and body size phenotypes in apparently healthy adults: The Korean National Health and Nutrition Examination Survey 2019-2021

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Backgrounds: Chronic kidney disease (CKD) is increasingly recognized as a public health issue with associations with various metabolic conditions. However, the relationship between CKD and different body size phenotype in a metabolically diverse, apparently healthy adult population remains under-explored.
Methods: Utilizing data from the Korean National Health and Nutrition Examination Survey (KNHANES) conducted from 2019 to 2021, we examined 8,227 participants to explore the association between CKD and body size phenotype. Phenotypes were defined using body mass index and metabolic syndrome markers into four categories: metabolically healthy normal weight (MHNW), metabolically abnormal normal weight (MANW), metabolically healthy obese (MHO), and metabolically abnormal obese (MAO). CKD status was determined based on the urine albumin-to-creatinine ratio and estimated glomerular filtration rate. Multivariable logistic regression models adjusted for age, sex, sociodemographic factors, lifestyle behaviors, and dietary intake were employed to analyze the data.
Results: The overall prevalence of CKD in the study population was 4.4%. In the CKD group, the prevalence was higher in the MANW and MAO phenotypes, at 12.6% for MANW and 26.4% for MAO, compared to 5.0% and 13.2%, respectively in the no CKD group. CKD prevalence rates by phenotype were 3.2% in MHNW, 10.5% in MANW, 4.0% in MHO, and 8.5% in MAO, with relatively higher prevalence observed in the MANW and MAO groups. After adjusting for potential confounders, the MAO phenotype exhibited the strongest association with CKD, showing an odds ratio (OR) of 3.770 (95% CI: 2.648-5.367) compared to the MHNW reference group. Similarly, MANW and MHO phenotypes also demonstrated increased odds of CKD with ORs of 2.492 (1.547-4.016) and 1.974 (1.358-2.870), respectively.
Conclusions: Our findings suggest that body size phenotypes, particularly metabolic abnormal phenotypes, are significantly associated with the presence of CKD in apparently healthy adults. These results underscore the importance of considering body composition and metabolic health in the early identification and management of CKD to mitigate its public health impact.

Conflict of Interest: None Disclosed

Funding: No funding to report

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Tab. 1. Association between chronic kidney disease and body size phenotypes.

Table 3. Association between chronic kidney disease and body size phenotypes

	Fully Adjusted OR (95% CI)				
	MAO		MANW		MHO
MAO/MHNW		MANW/MHNW		MHO/MHNW	
No CKD	Reference	No CKD	Reference	No CKD	Reference
CKD	3.770 (2.648-5.367)	CKD	2.492 (1.547-4.016)	CKD	1.974 (1.358-2.870)
MAO/MANW		MANW/MHO			
No CKD	Reference	No CKD	Reference		
CKD	1.242 (0.757-2.037)	CKD	1.477 (0.977-2.282)		
MAO/MHO					
No CKD	Reference				
CKD	1.897 (1.221-2.945)				

CI, confidence interval; MANW, metabolic abnormal normal weight; MAO, metabolic abnormal obese; MHNW, metabolic healthy normal weight; MHO, metabolic healthy obese; OR, odds ratio.
Logistic models are adjusted for age, sex, sociodemographic factors (place of residence, family income, and education), lifestyle behaviors (smoking status, alcohol consumption, regular exercise, total energy intake, carbohydrate intake, protein intake, and fat intake).

Tab. 2. Characteristics of the study population according to body size phenotypes.

	MHNW	MANW	MHO	MAO	*P*-value
Number (%)	5393	448	1417	1145	
Sex (male, %)	2044 (37.9)	238 (53.1)	811 (57.2)	718 (62.7)	0.001
Age (years)	43.45 ± 15.15	56.78 ± 13.54	41.98 ± 14.40	46.80 ± 14.00	0.001
BMI (kg/m^2)	21.58 ± 2.03	23.13 ± 1.51	27.44 ± 2.44	28.67 ± 3.22	0.001
WC (cm)	76.24 ± 7.02	84.75 ± 6.32	91.00 ± 7.54	95.91 ± 7.53	0.010
SBP (mmHg)	111.64 ± 13.76	129.74 ± 16.74	117.00 ± 12.00	126.38 ± 14.99	0.001
DBP (mmHg)	72.57 ± 8.98	81.02 ± 10.23	75.94 ± 8.46	82.87 ± 10.17	0.001
FPG (mg/dL)	93.00 ± 11.26	110.14 ± 28.19	94.84 ± 10.17	108.48 ± 24.92	0.001
HbA1c (%)	5.46 ± 0.39	5.98 ± 1.00	5.52 ± 0.36	5.93 ± 0.90	0.001
LDL-C (mg/dL)	120.68 ± 34.30	118.64 ± 35.46	132.06 ± 30.50	123.85 ± 33.16	0.523
HDL-C (mg/dL)	57.39 ± 12.70	43.50 ± 10.01	52.32 ± 10.58	43.30 ± 9.72	0.001
TG (mg/dL)	97.31 ± 64.79	236.91 ± 217.76	113.92 ± 70.93	220.03 ± 162.78	0.001
Creatinine (mg/dL)	0.77 ± 0.16	0.80 ± 0.18	0.82 ± 0.16	0.83 ± 0.16	0.002
eGFR (mL/min/1.73 m^2)[a]	102.58 ± 18.12	96.74 ± 19.32	101.15 ± 17.71	99.33 ± 19.07	0.414
UACR (mg/g)	9.47 ± 43.27	17.7 ± 70.52	8.47 ± 17.70	14.95 ± 42.53	0.001
Family income percentile (%) [a]					
< 25	581 (10.8)	97 (21.8)	136 (9.7)	137 (12.0)	
25-50	1173 (21.8)	130 (29.2)	360 (25.7)	293 (25.7)	
50-75	1588 (29.6)	94 (21.1)	434 (30.9)	341 (29.9)	
≥ 75	2029 (37.8)	124 (27.9)	473 (33.7)	371 (32.5)	0.001
More than high school education (%)	4537 (88.9)	274 (66.7)	1203 (88.3)	894 (82.9)	0.001
Residence in urban area (%)	4544 (84.3)	309 (69.0)	1174 (82.9)	913 (79.7)	0.001
Smoking					
Never	3502 (64.9)	221 (49.3)	756 (53.4)	554 (48.4)	
Past	987 (18.3)	114 (25.4)	355 (25.1)	299 (26.1)	
Current	875 (16.2)	110 (24.6)	300 (21.2)	287 (25.1)	0.001
Alcohol drinking (Yes, %)	3156 (58.5)	253 (56.5)	895 (63.2)	696 (60.8)	0.006
Regular exercise[a] (yes, %)	2381 (46.7)	145 (35.4)	717 (52.7)	463 (42.9)	0.001
Total energy intake (kcal)	1877.20 ± 822.24	1955.24 ± 848.89	1996.67 ± 886.45	2029.18 ± 1004.35	0.001
Carbohydrate intake (g)	264.78 ± 108.06	289.38 ± 109.44	270.64 ± 115.33	278.55 ± 118.32	0.001
Protein intake (g)	70.92 ± 37.68	70.06 ± 37.68	77.52 ± 41.09	76.73 ± 45.29	0.001
Fat intake (g)	51.06 ± 36.21	43.50 ± 33.07	54.54 ± 37.66	52.20 ± 40.97	0.001
CKD diagnosis[b]	166 (3.2)	46 (10.5)	56 (4.0)	96 (8.5)	0.001

Data are expressed as the mean ± SE for continuous variables and as weighted percentages for categorical variables.

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Tab. 3. Characteristics of the study population according to chronic kidney disease.

	No CKD	CKD[b]	*P*-value
Number (%)	7863	364	
Sex (male, %)	3595 (45.7)	144 (39.6)	0.024
Age (years)	43.98 ± 14.98	52.17 ± 16.60	0.001
BMI (kg/m^2)	23.60 ± 3.68	24.56 ± 4.32	0.001
WC (cm)	81.77 ± 10.54	84.95 ± 11.59	0.001
SBP (mmHg)	115.08 ± 14.68	125.89 ± 19.84	0.001
DBP (mmHg)	74.82 ± 9.68	79.66 ± 12.80	0.001
FPG (mg/dL)	95.86 ± 14.43	107.23 ± 36.99	0.001
HbA1c (%)	5.55 ± 0.51	5.95 ± 1.24	0.001
LDL-C (mg/dL)	122.99 ± 33.48	120.17 ± 39.19	0.250
HDL-C (mg/dL)	53.90 ± 13.04	52.09 ± 12.61	0.005
TG (mg/dL)	123.48 ± 106.61	149.95 ± 174.61	0.001
Creatinine (mg/dL)	0.79 ± 0.16	0.81 ± 0.22	0.001
eGFR (mL/min/1.73 m^2)	101.79 ± 18.06	96.29 ± 23.00	0.001
UACR (mg/g)	6.32 ± 4.29	100.88 ± 176.58	0.001
Family income percentile (%)			
< 25	838 (10.7)	88 (24.3)	
25-50	1812 (23.2)	98 (27.1)	
50-75	2325 (29.7)	81 (22.4)	
≥ 75	2850 (36.4)	95 (26.2)	0.001
More than high school education (%)	6517 (87.3)	249 (75.7)	0.001
Residence in urban area (%)	6541 (83.2)	259 (71.2)	0.001
Smoking			
Never	4699 (59.8)	228 (62.6)	
Past	1647 (20.9)	72 (19.8)	
Current	1478 (18.8)	62 (17.0)	0.728
Alcohol drinking (Yes, %)	4707 (59.9)	195 (53.6)	0.017
Regular exercise[a] (yes, %)	3481 (46.6)	147 (44.7)	0.484
Total energy intake (kcal)	1926.75 ± 866.82	1824 ± 826.92	0.001
Carbohydrate intake (g)	268.67 ± 110.78	269.95 ± 113.86	0.845
Protein intake (g)	73.14 ± 39.71	65.57 ±34.66	0.001
Fat intake (g)	51.8 ± 37.15	43.0 ± 33.36	0.001
Metabolic phenotype			
MHNW	5093 (64.8)	166 (45.6)	
MANW	394 (5.0)	46 (12.6)	
MHO	1337 (17.0)	56 (15.4)	
MAO	1039 (13.2)	96 (26.4)	0.001

Data are expressed as the mean ± SE for continuous variables and as weighted percentages for categorical variables.

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PO2.051

Association between Cumulative Exposure to Metabolic Syndrome and the Risk of Cardiovascular Diseases in Young Korean Adults: A Prospective Observational Study

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Background: While a strong association between metabolic syndrome (MetS) and cardiovascular diseases (CVD) has been established, research on the effects of cumulative exposure to MetS on CVD onset remains limited.
Methods: We analyzed 1,397,529 young adults (20~39 years old) from the National Health Insurance Service health checkup data. We calculated the cumulative number of MetS diagnoses across four consecutive health examinations (0, 1, 2, 3, and 4). We performed Cox proportional hazard models to analysis the relationship between MetS scores and the incidence of myocardial infarction (MI) and ischemic stroke.
Results: The adjusted HRs for MI and ischemic stoke increased as the score of MetS diagnoses increased and Mets score 4 has the highest HRs (1.932 and 2.193 for MI and ischemic stroke) compared to the group without MetS. The trend of these results was well observed in Men and individuals in their 30s.
Conclusions: These findings underscore the importance of early detection and management of MetS to improve CVD outcomes in Korean young adults.

PO2.052

Obesity among ICU patients in Austria: Secondary data analyses from the "International Prevalence Measurement of Care Quality"

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Introduction: The literature shows that intensive care nurses have to face many different challenges when caring for patients living with obesity. Some of these challenges may have a negative impact on the quality of care, like poor skin condition of patients with obesity. Comprehensive data on diseases and care problems are necessary in order to provide early prevention and treatment. Since there is hardly any scientific literature on obesity in intensive care units in Europe, secondary data from Austria was analyzed to gain an insight into ICU patients with and without obesity.
Methods: This secondary data analysis refers to data obtained as part of the International Prevalence Measurement of Care Quality. It is a cross-sectional study conducted annually on a specific day in all participating healthcare facilities and different European countries. The Austrian data from the participating intensive care units from 2016 to 2024 were used in the present analysis. Trained nurses in the voluntarily participating hospitals conducted the interviews, reviewed data records and performed the clinical examinations. Descriptive analyzes and inferential statistics were performed by IBM SPSS Statistics 29.
Results: Of the 538 ICU patients who participated, data on BMI was available for 232 patients (mean BMI 27.5 kg/m^2; 34.1% female; mean age = 65.0 years +- 14.6 SD). Of these, 23.7% intensive care patients lived with obesity. Almost a third of the total intensive care patients were completely dependent on care. The mean care dependency was somewhat lower for patients with obesity (mean score 47.0 ± 23.3 SD) than for patients with normal weight (mean score42.6 ± 21.0 SD). Some diseases were higher in ICU patients with obesity like endocrine, nutritional and metabolic diseases, diabetes mellitus and mental and behavioral disorders. Inspections showed that the prevalence of pressure ulcer was higher among patients with normal weight, while the risk for developing pressure ulcer was significantly higher amongst ICU patients with obesity. The rate of falls was higher amongst ICU patients with obesity. Incontinence, physical restraints and pain were not associated with obesity.
Conclusion: A quarter of intensive care patients were found to have obesity which is similar to a comparable previous study conducted amongst ICU patients in Austria. This study showed that pressure ulcer and falls are relevant problems among ICU patients with obesity. The data gives indications for proper care planning and treatment of intensive care patients with obesity in Austria.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO2.053

An exploration of physiotherapy educators' knowledge and attitudes and current curriculum content relating to obesity in entry-level physiotherapy programmes in Europe: A PROMINENCE survey

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Introduction: Physiotherapists have a critical role in obesity prevention and in the management and rehabilitation of people living with obesity. However, research suggests that obesity is given insufficient attention in the education of healthcare professionals (HCPs), with critical implications for healthcare delivery and patient outcomes. To address this issue and drive evidence-based physiotherapy practice, the international PROMINENCE (Promoting Obesity and Metabolic Rehabilitation INclusion in EU Entry-level Physiotherapy Curricula) project aims to develop an obesity competency framework and open education resource for physiotherapy education. As part of the project's needs analysis, the aim of this survey was to explore (i) current curriculum content and (ii) physiotherapy educators' knowledge and attitudes relating to obesity in entry-level physiotherapy programmes in Europe.
Methods: Underpinned by HCP competency literature and obesity guidelines, the PROMINENCE team designed the survey. The Europe Region of World Physiotherapy (ERWPT), the professional body for physiotherapy in Europe and a PROMINENCE partner, distributed the survey to higher education institutions (HEI) across Europe. Data were analysed using descriptive statistics on IBM SPSS 27.
Results: Seventy-eight responses were received from HEI's across 31 countries. A majority of HEI respondents (89%) reported the inclusion of some obesity content in the curriculum, with between 1 to 6 hours most commonly dedicated to its delivery (64%). Only 28% of respondents believed that the curriculum content was sufficient to prepare graduates to deliver evidence-based care for people with obesity. Lifestyle management of obesity was the most commonly addressed domain (90%), with 81% of HEI respondents teaching physical activity promotion. Only 41% of HEI respondents reported dietary advice content. Assessment of body composition and the complications of obesity were commonly included in curricula (87%). Only 18% of HEI respondents included content relating to physiotherapy care post metabolic surgery. Advocating for people with obesity (23%) and listening to the voice of the person with obesity (18%) were also less commonly addressed.
Conclusion: This survey highlights the need for enhancement of obesity education in entry-level physiotherapy programmes across Europe. The results of this survey will inform the development of the PROMINENCE Obesity Competency Framework and Open Education Resource for physiotherapy education.

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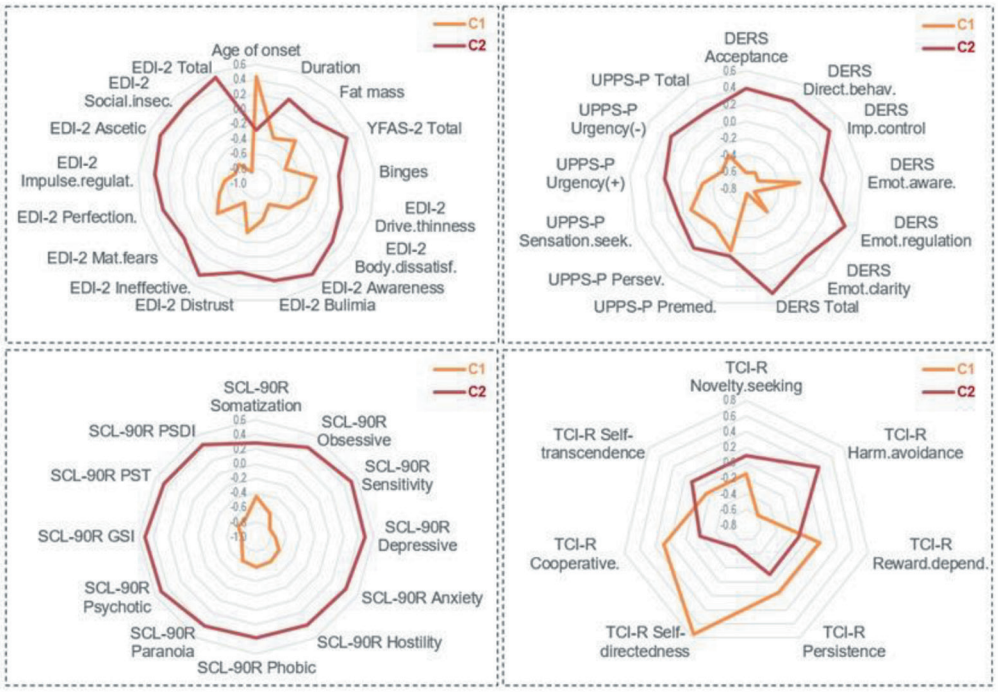
PO2.054

Addressing heterogeneity in Binge Eating Disorder and Obesity: A Cluster Analysis Approach based on Clinical and Psychopathological features

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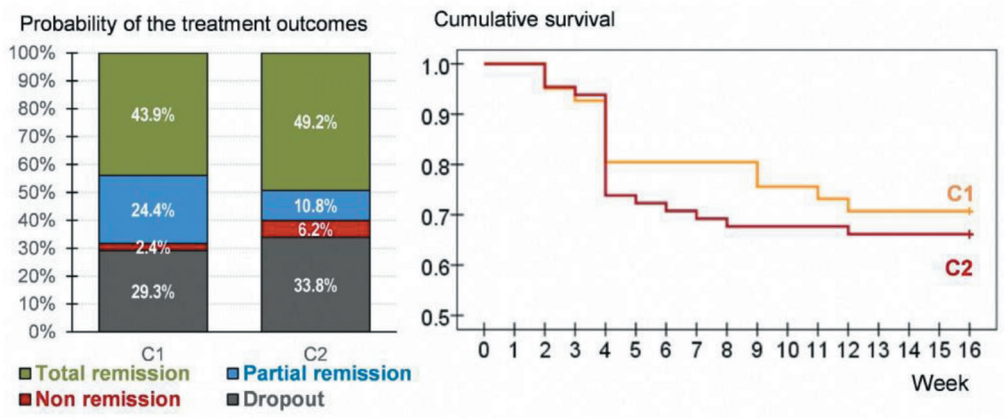
Introduction: Binge eating disorder (BED) is an eating disorder characterised by recurrent episodes of binge eating, namely acts of overeating that occur with loss of control in short periods of time. Individuals with BED frequently exhibit comorbid psychopathology, including lifetime anxiety, mood and addictive disorders, as well as dysfunctional personality traits, difficulties in emotional regulation and neuropsychological impairment. Moreover, given the frequency of overeating episodes and the subsequent caloric overconsumption, patients with BED often exhibit a multitude of metabolic health conditions, including obesity. The latter, has been well-documented as being associated with an increased risk



The visualization of the comparison of the two empirical clusters is provided through the radar-charts displayed in this figure (z-standardized means are plotted). Patients within C2 reported earlier onset and longer duration of the disorder, higher levels of fat mass, higher levels of FA (as measured by the YFAS-2), more frequent binge episodes per week, higher ED severity levels (as measured in all the EDI-2 scales and total scores), more difficulties in emotion regulation strategies (excluding DERS emotional awareness), higher levels of impulsivity (except for the UPPS-P lack of premeditation and sensation seeking scales), higher levels of general psychopathology (measured as SCL-90R), and a personality profile characterized by higher scores in harm avoidance and lower scores in self-directedness and cooperativeness.

Fig. 1. Radar-chart: visualization of the comparison of the two empirical clusters.

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The distribution of treatment outcomes within the empirical clusters is shown in the first panel of the figure: compared to C1, C2 was characterized by higher likelihood of poor treatment outcomes (dropout and non-remission). The cumulative survival function for the time to dropout is shown in the second panel of the figure, which suggests that both empirical groups were quite similar during the first month of the treatment, while cluster 2 tend to register higher rate of drop-out after the first weeks of therapy.

Fig. 2. Treatment outcomes and survival function for the rate of dropout.

of mental health issues, as well as the exacerbation of premorbid conditions, creating a challenging cycle to break. In an effort to enhance comprehension of these comorbidity and develop more tailored treatment approaches, this prospective study aimed to investigate the clinical heterogeneity of BED and obesity and its association with treatment outcome amongst individuals receiving treatment.

Methods: A two-step cluster analysis was performed on a clinical sample of n=196 patients with BED and obesity (x̄ age=38.9 years; x̄ Body Mass Index(BMI) =39.9Kg/m2) admitted to treatment at the Eating Disorders Unit of the Bellvitge University Hospital in Barcelona, Spain. The cluster classification was done through an agglomerative hierarchical procedure defined by both categorical and quantitative measures (psychopathological symptomatology, personality traits, emotional dysregulation, body composition, and the presence of food addiction). The Silhouette index was employed to assess the internal consistency for the selected optimal cluster solution. A later comparison between clusters was performed to evaluate therapy outcomes.

Results: Two distinct clusters emerged: C1 (n=77) and C2 (n=119). Patients within the C2 showed a more dysfunctional profile, characterised by more frequent binge behaviour, earlier onset and longer duration of the disorder, higher eating psychopathology, more difficulties in emotion regulation strategies, higher impulsivity levels, worse psychopathological state, higher food addiction level, and a personality profile characterized by higher scores in harm avoidance and lower scores in self-directedness and cooperativeness. Even though no statistical differences in BMI were observed between clusters, C2 presented a significant higher mean total body fat percentage, reflecting a worse metabolic state and severity of obesity. Patients allocated to the C2 additionally displayed a higher likelihood of poor treatment outcomes, including dropout and non-remission.

Conclusion: The results of this study suggest the presence of heterogeneity among patients with BED, which may affect therapy outcomes. These findings could contribute to the development of precise treatment strategies and more tailored approaches.

Founding: eprObes project (GA 101080219), funded by the EU through the Horizon Europe Framework Programme. LCB was supported by Sara Borrell fellowship -CD22/00171- Instituto de Salud Carlos III and co-founded by the EU.

PO2.055

The PROMINENCE (Promoting Obesity and Metabolic Rehabilitation INclusion in EU Entry-level Physiotherapy Curricula) project

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Introduction: The PROMINENCE (Promoting Obesity and Metabolic Rehabilitation INclusion in EU Entry-level Physiotherapy Curricula) project seeks to promote inter-connected higher education institutions (HEIs) and systems by collaborating to develop and standardise obesity education in entry-level physiotherapy programmes across Europe. The key aim of this project is to develop the PROMINENCE Obesity Competency Framework and Open Education Resource (OER) to facilitate evidence-based obesity education in entry level physiotherapy education programmes.

Methods: The PROMINENCE consortium comprises 5 academic partners (University College Dublin Mälardalen University, Tampere University of Applied Sciences, Arcada University of Applied Sciences and Hasselt University) and one professional organisation (Europe Region of World Physiotherapy). This project's needs analysis included (i) a scoping review of the literature regarding obesity education for healthcare professionals and (ii) an evaluation of current obesity education in entry-level physiotherapy programmes across Europe (survey). This needs analysis will inform the development of the Obesity Competency Framework for physiotherapy education, which will align with the current Europe Region of World Physiotherapy competency domains for entry-level physiotherapy programmes. This framework will then underpin the development process for the PROMINENCE OER.

Results: Project activities completed to date include: (i) scoping review of literature regarding obesity competencies for healthcare professionals (ii) survey of European HEIs regarding obesity education for physiotherapists,

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and (iii) transnational PROMINENCE partner think tanks. Results of the needs analysis indicate that enhancement of obesity education in physiotherapy programmes is required, with specific gaps identified (e.g. rehab post metabolic surgery). The current work packages are focused on the development of the PROMINENCE Obesity Competency Framework and Open Education Resource.
Conclusion: Needs analysis findings confirm that the PROMINENCE project and planned outputs (Competency Framework and OER) are warranted to facilitate evidence-based education for Physiotherapy across Europe.

PO2.056

Social disparities in obesogenic environment exposures: Insights from a Central European city

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Introduction: The prevalence of obesity is driven by broader social and environmental determinants. Exposure to the neighbourhood-built environments that are not very walkable and have a high density of unhealthy food outlets influence individual health behaviours and may promote obesity development. Environmental characteristics do not occur randomly, and areas with higher or lower obesogenicity may cluster with socioeconomic disparities. The spatial distribution of obesogenic environment may be affected by country-specific cultures and characteristics that are not generalisable. So far, a major proportion of studies on obesogenic neighbourhood factors comes from Western European countries and cannot be directly applied to the countries of the former Eastern European bloc due to socio-political changes in recent decades, which might influence the socioeconomic segregation, characteristics of built environment and trends in population health. Therefore, this study aimed to assess and map the obesogenicity of urban neighbourhoods in Czechia and investigate the socioeconomic disparities in obesogenic exposures.
Methods: This study was conducted in Brno, the second largest city in Czechia. The obesogenic index (ranging from 0 to 100) was calculated based on 12 obesogenic components of food and physical activity environments for each of the 296 basic settlement units (BSUs). We composed the food and physical activity environmental scores by averaging the z-scores of all relevant components. Then, we calculated the obesogenic index by linear aggregation, taking the arithmetic mean of the food and physical activity environment scores, and rescaled it to range from 0 (low obesogenicity) to 100 (high obesogenicity). The differences in obesogenicity among BSUs with socioeconomic variables were assessed using a t-test. Spatial clustering was assessed using the global Moran's Index.
Results: The median obesogenic index score for Brno's 296 BSUs was 72.09 (IQR=24.03). For food and physical activity environments, the median index scores were 86.55 (IQR=28.47) and 63.80 (IQR=20.28), respectively. Less obesogenic environments tended to concentrate centrally within the city, whereas areas exhibiting the highest levels of obesogenicity were mainly situated in the peripheries and industrial zones. Areas with higher unemployment were generally less obesogenic and had healthier food and physical activity features ($p<0.001$). No differences were observed between areas with higher and lower proportions of low education.
Conclusion: In Brno, the obesogenicity of environments varied considerably across neighbourhoods. Areas with lower obesogenicity were mainly concentrated centrally due to high walkability and access to sports facilities. No clear socioeconomic gradient was observed, although neighbourhoods with higher unemployment rates were more obesogenic. Studying obesogenic environments in Central and Eastern Europe is crucial given regional cultural differences and past dynamic socio-political changes leading to rising obesity rates, which calls for focused research to best address these specific challenges. #NGEU

PO2.057

Sarcopenia and Sarcopenic Obesity in Nursing Home Residents: The Role of Dietary Inflammatory Index

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Introduction: Sarcopenia and sarcopenic obesity (SO) are important morbidity factors in the geriatric population and one of the main roles in their pathology has been attributed to inflammation. This study aims to compare dietary inflammatory index (DII), daily protein and energy intake in sarcopenia and SO among nursing home residents.
Methods: This cross-sectional study was conducted in nursing home residents aged 65 years and over. Sarcopenia was defined according to the EWGSOP2 algorithm(1), obesity according to the WHO definition(2) or fat percentage and SO according to the ESPEN/EASO consensus(3). 24-hour dietary recall per 3 days was used to assess nutritional status, the inflammatory status of the diet was calculated by the diet inflammatory index (DII)(4), and the bioelectrical impedance analysis and hand dynamometer were used for the anthropometric measurements. Groups were

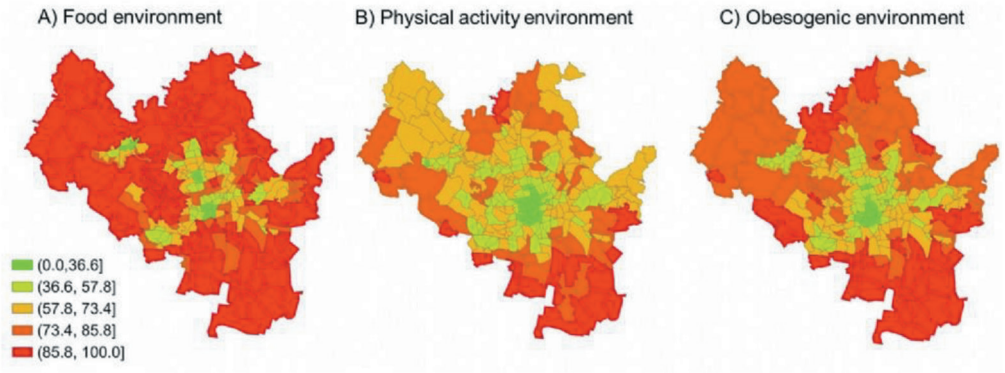


Fig. 1. Heatmap of obesogenic food environment, physical environment and overall obesogenic exposures at the basic settlement's units of Brno.

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Tab. 1. Comparison of dietary inflammatory index, daily energy and protein intake between groups.

	Healthy (H) (n: 56)	Only obesity (O) (n: 122)	Only sarcopenia (S) (n: 63)	Sarcopenic obesity (SO) (n: 66)	Total (n: 307)	p
DII score	-1.35 (0.87)	-1.52 (0.73)	-0.54 (0.34)	-0.55 (0.43)	-1.10 (1.10)	0.00*a
Energy intake (kcal/kg/d)	36.10 (13.76)	30.51 (10.96)	25.57 (9.69)	20.66 (7.69)	28.18 (13.44)	0.00*a
Protein intake (g/kg/d)	1.41 ± 0.46	1.22 ± 0.37	1.05 ± 0.29	0.88 ± 0.28	1.15 ± 0.40	0.00*b

for footnote: *P<0.01; a. Kruskal-Wallis test, b. Oneway ANOVA test; Data are presented as mean±SD or median (IQR).

compared using One-way ANOVA or Kruskal-Wallis tests depending on the normal distribution of the data.

Results: The study sample consisted of 307 individuals, including 66 (21.5%) SO, 63 (20.5%) sarcopenia-only (S), 122 (39.7%) obesity-only (O) and 56 (18.2%) healthy individuals (H; no sarcopenia or obesity). The mean age was 81.60±7.09 years, and 61.6% of the participants were female. The duration of living in the nursing home was 6.02±4.83 years, and the number of comorbidities or polypharmacy was similar between the groups. Daily energy and protein intake per body weight were different in all pairwise comparisons in posthoc tests ($p<0.05$). According to post-hoc analyses, both the only obesity group (O) and the reference healthy group (H) had lower DII scores than the sarcopenia-only (S) and sarcopenic obesity (SO) groups. However, DII scores were similar between the O and H groups and also, between the S and SO groups.

Conclusion: The fact that DII, which was similar between the two groups with sarcopenia (S and SO), was higher in these groups than in the groups without sarcopenia (O and H) emphasizes that DII may be an important strategy, especially in the management of sarcopenia.

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PO2.058

Metrics that matter: identifying endpoints for capturing the broad health impacts of obesity prevention

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Introduction: The links between health and economic prosperity are increasingly clear. It is, however, difficult to quantify the value of preventing illness to maintain healthy lives. One key challenge to overcome this knowledge gap is the scarcity of metrics that can fully capture the impact of prevention. These challenges and opportunities are probably best illustrated by obesity in the population, which has a wide-ranging impact on healthcare systems and society but limited funding for its prevention. We aimed to develop a composite and more holistic metric reflecting broader obesity prevention impacts that enables greater articulation of the value of prevention.

Methods: We conducted a targeted literature review to identify existing individual and composite metrics for prevention, agnostic of disease or risk factor. We categorised the endpoints assessed into one of four categories: i) holistic (health outcome, risk factors and wider societal determinants of health) composite measures; ii) user-centred (patient-reported outcome measures) composite measures; iii) health outcome composite measures; iv) single clinical endpoints. Metrics were evaluated against eight evaluation criteria (holistic outcome, relevant to cardiometabolic health, data feasibility, geographically generalisable, established outcome, established methodology in economic modelling, stakeholder relevance [including policymakers, payers, healthcare providers, physicians, patients and caregivers) and represents preventive value] alongside semi-structured review from six clinical, health economics and policy experts. This resulted in a shortlist and ultimately a proposed composite cardiometabolic health metric to reflect the benefits of obesity prevention.

Results: A total of 74 possible cardiometabolic endpoints were identified in the targeted literature review: 7 holistic composites, 16 user-centred composites, 31 health-based composites and 20 single clinical endpoints. These spanned from the American Heart Association Life's Simple 7, the UK ONS' Health Index, the WHO's Metabolic Syndrome definition to individual clinical outcomes such as hypertension or diabetes. Five endpoints were identified according to the assessment criteria and expert panel input to form the composite metric reflecting obesity prevention impacts; these were waist-to-height ratio, low-density lipoprotein (LDL) cholesterol, systolic and diastolic blood pressure, blood glucose and the 12-Item Short Form Survey (SF-12). This composite reflected physiological cardiometabolic risk factors with evidence of adverse association with obesity and in turn leading to negative clinical endpoints, while SF-12 provided a holistic health-related quality of life measure.

Conclusion: We have developed a novel cardiometabolic composite metric from endpoints that can holistically capture the benefits of obesity prevention. This composite measure has potential applications such as in health economic modelling and can be tested further to demonstrate association with prevention interventions and broader outcomes. Such research would provide a more meaningful metric to articulate the impact of preventive initiatives.

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PO2.059

Body composition and risk of breast cancer after menopause among women in the Danish Diet, Cancer and Health cohort

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Introduction: Breast cancer diagnosed after menopause is clearly linked with greater body mass index (BMI). However, more knowledge is needed on how the two components of BMI, fat mass (FM) and fat-free mass (FFM), influence the risk. The FM/FFM ratio may be regarded as a measure of sarcopenic obesity, i.e., loss of muscle mass and excess body fat. We investigated how body composition is associated with risk of estrogen receptor (ER) positive and negative breast cancer in postmenopausal women who never used hormone replacement therapy.
Methods: From the Danish prospective cohort, Diet, Cancer and Health, we included 11,631 women who were postmenopausal and never users of hormone replacement therapy at enrolment in 1993-1997. Anthropometric measurements were performed at baseline including bioelectrical impedance measurements for calculation of FM and FFM. The women were followed for breast cancer in the Danish Cancer Register and the Danish Breast Cancer Group (DBCG) database through 2022. We estimated hazard ratios (HR) and 95% confidence intervals (CI) for breast cancer in Cox regression models for height-normalised indices of FM (FMI) and FFM (FFMI)(per 1 kg/m² increase) with mutual adjustment and for the FM/FFM ratio (per 10% increase), respectively. The models were further adjusted for known risk factors for breast cancer such as age, education, height, reproductive factors, alcohol intake, physical activity and use of oral contraceptives.
Results: In total, 743 women developed ER positive breast cancer and 144 developed ER negative breast cancer during follow-up. Each unit increase in FFMI was positively associated with ER positive breast cancer (HR = 1.15; 95%CI = 1.05-1.27) and non-significantly with ER negative breast cancer (HR = 1.10; 95%CI = 0.88-1.36), whereas FMI was not associated with ER positive (HR = 0.99; 95%CI = 0.96-1.03) or ER negative breast cancer (HR = 1.01; 95%CI = 0.93-1.10). Higher FM/FFM ratio was also associated with both ER positive breast cancer (HR = 1.07; 95% CI =1.03-1.12) and ER negative breast cancer (HR = 1.09; 95% CI = 0.99-1.20).
Conclusion: Our study provides evidence that excess FFM plays a role in the development of both ER positive and negative breast cancer among postmenopausal women. In addition, sarcopenic obesity, measured by the FM/FFM ratio, was found to increase the risk of both types of breast cancer.

Conflict of Interest: Unrelated to this work J Baker has received consulting fees from Novo Nordisk A/S. L Mellemkjær has an immediate family member who is employed at Novo Nordisk A/S and an immediate family member who owns stocks in Novo Nordisk A/S.

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PO2.060

Obesity and Gastrointestinal Cancer Risk in Organ Transplant Recipients: A Nationwide Matched Cohort Study

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Introduction: Obesity is a major gastrointestinal (GI) cancer risk factor[1] and studies have reported elevated obesity rates among organ transplant (OT) recipients[2]. However, the influence of obesity on GI cancer incidence in OT recipients remains under-investigated.
Methods: A total of 10,507 OT recipients between January 2002 and December 2022 from the National Health Insurance Service of South Korea were included in the analysis. The inclusion criteria required individuals to have undergone a health screening within two years prior to OT. The study population consisted of participants who underwent kidney, liver, lung, or heart transplants. Participants with obesity were defined as participants whose average Body Mass Index was over 25 kg/m2 during the two years prior to OT. The control group was composed of participants 1:1 matched with transplant recipients based on age, sex, hypertension, diabetes, and study inclusion year using exact matching. Standardized Incidence Ratio (SIR) analyses were conducted to evaluate the incidence of GI cancers. GI cancers include anal cancer, colorectal cancer, esophageal cancer, gallbladder & biliary tract cancer, liver cancer, and stomach cancer. Median follow-up years were 4.95 (InterQuartile Range: 2.01-8.73) in the OT group and 5.80 (3.19-10.01) in the control group.
Results: SIR for GI cancers of four groups were shown in Table 1. In the OT group, SIR of participants with obesity was 6.44 (95% Confidence Interval: 5.59–7.34), compared to participants without obesity with an SIR of 4.23 (3.77–4.71). In the control group, SIR of participants with obesity was 2.18 (1.82–2.57) and that of participants without obesity was 2.05 (1.72–2.41). The relative effect of obesity, represented by the ratio of SIRs, was 1.52 in the OT group and 1.06 in the control group. The difference in the log-transformed ratios between the two groups was 0.36 (p-value: 0.018) and the log-transformed difference (0.360) corresponds to a ratio of e0.360 ≈ 1.43, indicating that the relative effect of obesity on GI cancer risk is approximately 43% greater in the OT group compared to the control group.
Conclusions: This study demonstrates that the relative effect of obesity on GI cancer risk is significantly greater in OT recipients compared to the general population. The findings highlight the critical need for targeted interventions to manage obesity among OT recipients to mitigate the heightened GI cancer risk.

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Conflict of Interest: None Disclosed.

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Tab. 1. Group-Specific Standardized Incidence Ratios and 95% confidence intervals for gastrointestinal cancers.

	Participants with Obesity	Participants without Obesity
Organ Transplant Group	6.44 (5.59-7.34)	4.23 (3.77-4.71)
Control Group	2.18 (1.82-2.57)	2.05 (1.72-2.41)

PO2.061

The independent and joint association of non-alcoholic fatty liver disease and physical activity with all-cause and cardiovascular disease mortality in hypertensive patients: A nationwide cohort study

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Introduction: Hypertension and non-alcoholic fatty liver disease (NAFLD) frequently coexist, increasing the risks of cardiovascular and all-cause mortality through shared metabolic and inflammatory pathways. Physical activity (PA) is a protective factor against cardiovascular disease (CVD); however, its role in mitigating the combined effects of hypertension and NAFLD on mortality remains unclear. This study examines the independent and joint associations of PA and NAFLD with all-cause and cardiovascular mortality in a nationwide cohort of individuals with hypertension.

Methods: We utilized data from the National Health Insurance Service (NHIS) of Korea, covering the baseline period from 2009 to 2012 and follow-up until December 31, 2021. The study population included adults aged 20 years or older diagnosed with hypertension. Physical activity levels were categorized based on self-reported data as <500 MET-min/week, 500–999 MET-min/week, and ≥1000 MET-min/week. NAFLD was classified using the NAFLD index into three categories: <30, 30–59, and ≥60. Cox proportional hazards regression models were employed to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for all-cause and cardiovascular mortality, evaluating both the independent and joint associations of PA and NAFLD.

Results: A total of 139,015 participants (mean age: 55.7 ± 13.1 years; 51.6% women) were analyzed over a median follow-up of 9.1 years. During this period, 12,281 deaths were recorded, including 2,013 from CVD. Participants with NAFLD levels ≥60 had significantly higher risks of all-cause mortality (HR 1.66, 95% CI 1.56–1.78) and CVD mortality (HR 1.62, 95% CI 1.56–1.78) in fully adjusted models. In contrast, individuals engaging in ≥1000 MET-min/week of PA exhibited the lowest risks for both all-cause and CVD mortality. Specifically, compared to the reference group (NAFLD ≥60 and <500 MET-min/week), those with ≥1000 MET-min/week of PA had hazard ratios of 0.86 (95% CI: 0.76–0.98) for all-cause mortality, 0.58 (95% CI: 0.52–0.64) for the NAFLD 30–59 group, and 0.47 (95% CI: 0.43–0.52) for the NAFLD <30 group. Similar patterns were observed for CVD mortality, with HRs of 0.84, 0.60, and 0.47, respectively.

Conclusion: Higher levels of PA are associated with significantly reduced risks of all-cause and cardiovascular mortality in individuals with hypertension, including those with severe NAFLD. These findings highlight the protective role of PA across different NAFLD categories and underscore its importance in mitigating mortality risks in high-risk populations. Promoting regular PA should be a key strategy for managing hypertension and NAFLD.

PO2.062

Development of a questionnaire to assess Metabolic Bariatric Surgery-Related Stigma

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This study presents the development of a questionnaire designed to assess the social challenges faced by metabolic bariatric surgery patients, specifically focusing on experiences of surgery-related stigma and the internalization of such stigma. While existing tools measure related constructs like weight stigma and weight bias (Bennett et al., 2022; Dijkhorst et al, 2024), none specifically address the stigma associated with metabolic bariatric surgery itself.

The questionnaire goal is to assess how patients experienced and internalize societal views about metabolic bariatric surgery. In this way the tool can help to identify psychosocial challenges patients face both during and after the surgical process.

The questionnaire was developed using topic-focused semi structured interviews and cognitive interviews with metabolic bariatric surgery patients. These methods were employed to ensure the tool accurately reflects patients' lived experiences and the complex nature of stigma related to metabolic bariatric surgery. Topic-focused semi-structured interviews were conducted to gather input on relevant concepts and themes from patients, which informed the development of the initial questionnaire. Cognitive interviews (Balza et al., 2022), a technique used to understand the respondents' thought processes while completing the questionnaire, were used to refine and improve the questionnaire's clarity, relevance, and ability to effectively capture the nuanced experiences of stigma faced by patients.

Ultimately, the questionnaire can be used as a tool/instrument to better understand the ways in which stigma affects patients' lives, helping to inform interventions that can mitigate the harmful effects of stigma and enhance the overall well-being and psychosocial outcomes for metabolic bariatric surgery patients.

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PO2.064

Adult weight gain, age at first pregnancy and breast cancer risk: a UK PROCAS study

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Background: Adult weight gain increases the risk of post-menopausal breast cancer (BC), whereas an early first pregnancy (FP) may provide a protective effect. There is limited evidence of whether an interaction between these factors exists, and to what extent the adverse effects of adult weight gain are attenuated by an early FP. As pregnancy is a key risk factor for weight gain in women, this study aimed to explore the effect of parity and adult weight gain on BC risk and determine whether there is an interactive effect.

Methods: We analysed data on 48,417 women recruited to the UK PROCAS Cohort Study (Greater Manchester, 2009 - 2015) with a median baseline body mass index (BMI) of 26.3 kg/m^2 and a median age of 57 years. Recall weight at age 20 was used to derive weight gain differences between those who had an early FP (<30yrs), late FP (≥30yrs), or were nulliparous. Multiple linear regression was performed to investigate the association between adult weight gain and age of FP.

We developed Cox models with incident BC as the primary outcome, and explored associations across four groups: (1) FP <30 years, low weight gain (< 15%) (referent); (2) FP < 30 years, high weight gain (≥ 15%); (3) nulliparous or FP ≥ 30 years low weight gain (<15%); and (4), nulliparous or FP≥ 30 years FP, high weight gain (≥ 15%). Tests for additive and multiplicative interactions were performed and the Relative Excess Risk (RERI) was derived.

Results: With a median of 6.4 years follow-up, there were 1,702 new BCs. Multiple linear regression of FP age & weight gain found that those with an earlier FP had a greater weight gain during adulthood compared to those with a late FP, with a beta coefficient (β) of -0.39 (95% CI: -0.43 - -0.35, p<0.001) for % weight gain amongst parous participants.

Those with adult weight gain >30% and a late FP (>30 years) or nulliparous status (group 4) had an almost 3 times higher risk of developing BC (HR: 2.73, 95% CI: 2.09 - 3.56) compared with those who had an early FP without adult weight gain (group 1). For the additive interaction effect, the estimated RERI for group 4 compared with group 1 was 0.24 (95% CI: -0.04 – 0.53). The multiplicative interaction effect of late parity and weight gain (with weight gain used as a continuous variable) was 1.001 (95% CI: 0.997 – 1.006, p=0.553).

Sensitivity analyses for ER+ve BC, ductal carcinoma in situ (DCIS), screen detected BC and post-menopausal participants found similar results.

Conclusion: We found no evidence of an interaction effect between adult weight gain and age of first pregnancy on BC risk. However, the increased risk for women with high adult weight gain and a late FP or nulliparous status suggests they are a suitable target for BC prevention strategies through weight control.

Conflict of Interest: None

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PO2.065

Environmental Exposure and Their Role in Obesity: Insights from a Belgian Cohort Study

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Introduction: Obesity is a growing public health disease with complex causes, influenced by genetic, behavioural, and environmental factors. This study investigates the impact of environmental factors, such as air and noise pollution, proximity to roads and airports, exposure to residential green spaces, and air temperature, on patients with obesity (PwO), overweight, and normal weight.

Methods: Consecutive patients screened for stable chest pain within the Belgian population from 01/10/2013 to 28/05/2021 were enrolled in a registry. The effects of exposure to NO_2, $PM_{2.5}$, PM10, noise of airports, distance to airports, distance to major roads, access to green spaces (normalised difference vegetation index (NDVI)) at patients' residential addresses, and heat days was evaluated among PwO, overweight, and normal-weight patients. Continuous and categorical variables were analysed and compared among patients with obesity (PwO), overweight, and normal weight using the Mann-Whitney U test, Kruskal-Wallis-test and Chi-squared test.

Results: A total of 4894 patients were enrolled (table 1), including 1576 with a BMI of 18.5 ≤ BMI < 25 (mean age: 58.2 ± 14.3), 1888 with a BMI of 25 ≤ BMI < 30 (mean age: 59.2 ± 12.6), and 1430 with a BMI ≥ 30 (mean age: 59.1 ± 11.4). PwO were exposed to higher levels of NO_2 compared to both normal weight (P < 0.0001) and overweight individuals (P < 0.0001). $PM_{2.5}$ exposure, was higher in PwO compared to the normal weight group (P < 0.015). Higher levels of noise from airports were seen in PwO compared to those with normal weight (P < 0.0001). PwO lived closer to major roads compared to both normal weight (P < 0.0001) and overweight groups (P < 0.01) and closer to airports compared to both normal weight (P < 0.0001) and overweight groups (P < 0.05). Access to green spaces (NDVI), was lower for participants with obesity compared to the normal weight group (P < 0.0001). Additional differences were observed in heat exposure whereby PwO experienced slightly more heat days compared to those with normal weight (P < 0.0001).

Conclusion: Residential environmental factors differed significantly between PwO and those with normal weight, suggesting that environmental exposures play a role in obesity risk. Multivariate analyses incorporating socioeconomic data are essential to confirm these findings.

Tab. 1. Demographics and Environmental Factors by BMI Categories.

	Normal Weight	Overweight	Obesity	P-value
Number of participants	1576	1888	1430	
BMI (kg/m²)	22.6 ± 1.7	27.3 ± 1.4	34.1 ± 3.8	
Gender (women)	54.2%	42.6%	49.3%	
Age (years)	58.2 ± 14.3	59.2 ± 12.6	59.1 ± 11.4	
Income yearly (euro)	26523 ± 5536	26087 ± 5736	24904 ± 5648	
NO_2 (µg/m³)	21.4 ± 6.0	21.9 ± 5.9	23.0 ± 6.3	<0.0001
$PM_{2.5}$ (µg/m³)	12.3 ± 0.7	12.3 ± 0.7	12.4 ± 0.7	0.015
PM_{10} (µg/m³)	19.5 ± 1.3	19.5 ± 1.2	19.5 ± 1.1	0.51
Heat Days yearly	11.2 ± 3.1	11.5 ± 3.2	12.0 ± 3.2	<0.0001
Distance to Road (km)	1.031 ± 1.130	0.979 ± 1.130	0.855 ± 1.039	<0.0001
Distance to Airport (km)	15.259 ± 10.054	14.400 ± 93.10	13.451 ± 8.609	<0.0001
NDVI	126 ± 7.5	126 ± 7.4	125 ± 7.6	<0.0001
Noise airports (≥45 dB)	30.1%	34.6%	43.4%	<0.0001

NDVI (normalised difference vegetation index)

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PO2.066

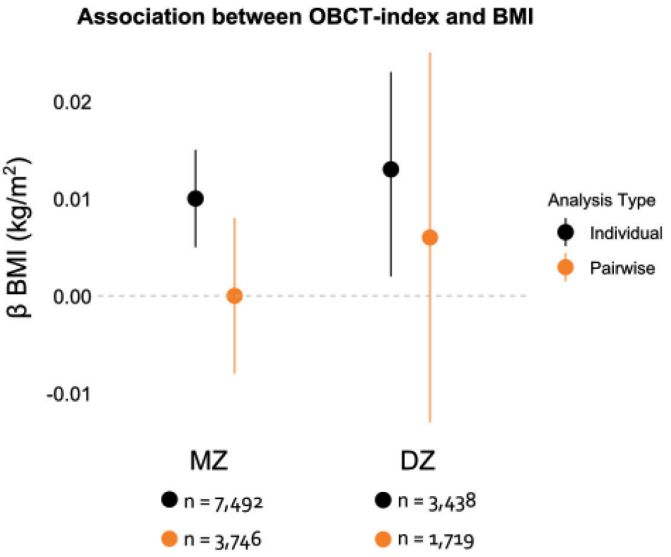
Quantifying the obesogenic environment in the US and investigating its quasi-causal association with obesity: a twin study

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Background: Genetic and environmental influences underlie obesity development. The obesogenic environment can be quantified using the Dutch Obesogenic Built Environment CharacterisTics (OBCT) index. This study aimed to 1) adopt the OBCT-index for the U.S., a country with a high obesity burden, and 2) investigate the association between the adopted OBCT-index and BMI in a large sample of adult twins living in different environments across the US, controlling for genetic and shared environmental factors that would otherwise confound such relationships.
Methods: This cross-sectional twin study included 10,930 adult twins (n = 5,465 pairs) from the Washington State Twin Registry, mean ± SD age 42 ±18 years, of whom 65% were female and 69% genetically identical (monozygotic [MZ]). They participated between 2009 and 2019.
The OBCT-US-index consisted of: 1) walkability index (physical activity environment), 2) modified retail food environment index (food environment), 3) normalized difference vegetation index (natural environment), and 4) area deprivation index (socioeconomic environment). Each construct was estimated near the home address (varying from a 250 m circular Euclidean buffer to census tract level estimates), and contributed equally to the overall OBCT-US-index (0-100).
We performed individual and pairwise analyses between the OBCT-US-index and BMI controlling for age, sex, smoking, alcohol, race, education, household income, and marital status. The individual analyses were univariate linear mixed models on the association between the OBCT-US-index and BMI. For the pairwise analyses, we divided the twin pairs into co-twins with a lower OBCT-US-index score and co-twins with a higher OBCT-index score (none had identical OBCT-index scores). Next, we calculated the within-twin-pair differences in OBCT-US-index and BMI, which inherently controls for familial confounding factors (e.g., DNA and shared early life environmental factors). We then performed a linear regression between the OBCT-US-index and BMI difference values.
Results: Living in a 10% higher OBCT-US-index environment was associated with a mean [95% CI] 0.10 [0.05, 0.15] kg/m² higher BMI in MZ twin individuals and 0.13 [0.02, 0.23] kg/m² in dizygotic twin individuals (Figure). However, these associations were attenuated and no longer significant in the pairwise twin analyses.
Conclusion: A more obesogenic environment is associated with higher BMI at the individual level, but this association might be largely explained by shared familial influences, including genetic, sociodemographic, and early-life environmental factors.

Fig. 1. The association between OBCT-index (0-100) and BMI (kg/m2) in individual and pairwise analyses.



Estimates include beta values with 95% confidence intervals.
OBCT = Obesogenic Built Environment CharacterisTics, BMI = body mass index, MZ = monozygotic, DZ = dizygotic, n = number of individuals (black) or pairs (orange). Individual analysis = linear mixed model, pairwise analysis = linear regression. All analyses were corrected for age, sex, smoking, alcohol consumption, race, education, household income, and marital status.

PO2.067

Health Literacy and Sociodemographic and Psychosocial Determinants of Overweight and Obesity

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Introduction: Overweight and obesity are commonly known as modifiable risk factors of many diseases like cardiovascular disease and neoplasm - the main cause of death in Poland. The proportion of adults with overweight reached 65.6%, including 29.2% people with obesity, in 2022. The study aimed to find relationships between increased body weight and health literacy, sociodemographic and psychosocial risk factors.
Methods: The existing medical data of participants of the WOBASZ II Survey were used. There were 2405 persons (1098 men, 1307 women), median (IQR) aged 50 (36-61) years involved in the present study: 35.3% with normal weight, 38.3% with overweight and 26.4% with obesity. The Newest Vital Sign Test, the Beck's Depression Inventory and Berkman & Syme Questionnaire were applied to estimate functional health literacy, depression and social support, respectively. The logistic regression was conducted to estimate odds ratio (OR) with 95% confidence interval (CI) assigned to selected risk factors.
Results: Most of the respondents had at least secondary education (59.1%), an adequate health literacy (55.1%), and at least moderate social support (49.9%), and only 14.5% of them reported depression. Cardiovascular disease was present in 11.7%, 18.1%, 28.2% of people with normal weight, overweight and obesity, respectively.

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Age was an independent risk factor of overweight (OR, 95% CI: 1.03 (1.02-1.04) in men, 1.04 (1.03-1.05) in women) and obesity (OR, 95% CI: 1.04 (1.02-1.05) in men, 1.06 (1.04-1.07) in women). Being married was associated with overweight in both sexes (OR, 95% CI: 1.62 (1.16-2.28) in men, 1.39 (1.03-1.87) in women), and with obesity only in men (OR, 95% CI: 3.19 (2.05-4.96)). Primary education towards higher education decreased the chance of being overweight (OR, 95% CI: 0.47 (0.26-0.85)) or obese (OR, 95% CI: 0.45 (0.21-0.98)) in men but not in women. In turn, in women vocational and secondary education increased the odds of being overweight (OR, 95% CI: 2.26 (1.43-3.56) and 1.57 (1.10-2.24)) or obese (OR, 95% CI: 2.70 (1.58-4.61) and 1.85 (1.19-2.87)). The other female-specific risk factors that were related with increased body weight were living in the community of less than 8.000 people (OR, 95% CI: 1.46 (1.05-2.03)), while having an inadequate health literacy or reporting at least borderline depression increased the chance of being obese (OR, 95% CI: 1.43 (1.02-1.99), 2.06 (1.06-4.03), respectively). The association between social support and body weight was negligible in our analysis.

Conclusion: Age, education level and marital status have undeniable impact on living with overweight or obesity in adulthood regardless of sex. In turn, inadequate health literacy and having at least borderline depression were associated with obesity in women. It seems that the dissemination of health knowledge and health promotion across lifespan could reduce the disturbing phenomenon of increasing obesity in the Polish population.

PO2.068

Adulthood weight trajectories and cause-specific mortality: evidence from 620,000 individuals in the Obesity and Disease Development Sweden (ODDS) study

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Introduction: Studies on longitudinal weight change and its timing, and cause-specific mortality are limited. We comprehensively studied adulthood weight trajectories in association with all-cause and cause-specific mortality.

Methods: We applied linear mixed effects models to predict weight trajectories at 17–60 years of age, age-specific weight change rates (17–<30, 30–<45, and 45–60 years), and age of obesity onset in 258,269 men and 361,784 women in Sweden with ≥3 weight assessments between ages 17 and 60 years. The association with mortality was calculated using multivariable Cox regression.

Results: The median predicted annual weight change through ages 17–60 years was 0.42 kg/year in both men and women, with higher weight change rates observed in younger ages. During a median follow-up of 28.3 years in men and 16.7 years in women, 86,673 men and 29,076 women died. We observed positive associations for quintiles of weight trajectories at 17–60 years (p trend <0.05), weight change in young age (17–<30 years) generally with weaker associations in older ages, and for younger age of obesity onset (p trend <0.05 across categories), with risk of mortality from all causes, cardiovascular disease (CVD) including separately for most CVD-specific death causes, cancer including separately for some cancers, diabetes type 2, the digestive system, and genitourinary diseases. Hazard ratios (95% confidence intervals) of all-cause mortality in men and women were 1.25 (1.24 to 1.27) and 1.23 (1.20 to 1.25), respectively, per 0.5 kg/year weight change at 17–<30 years, and 1.81 (1.71 to 1.91) and 1.89 (1.73 to 2.07) for obesity onset at 17–<30 years *vs.* never developing obesity by age 60 years.

Conclusions: Adulthood weight gain, especially in young age, and early obesity onset is associated with a higher mortality from any cause and from many non-communicable diseases.

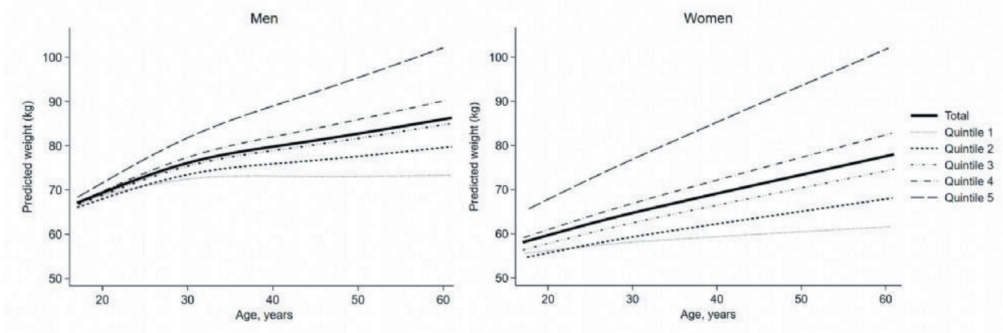
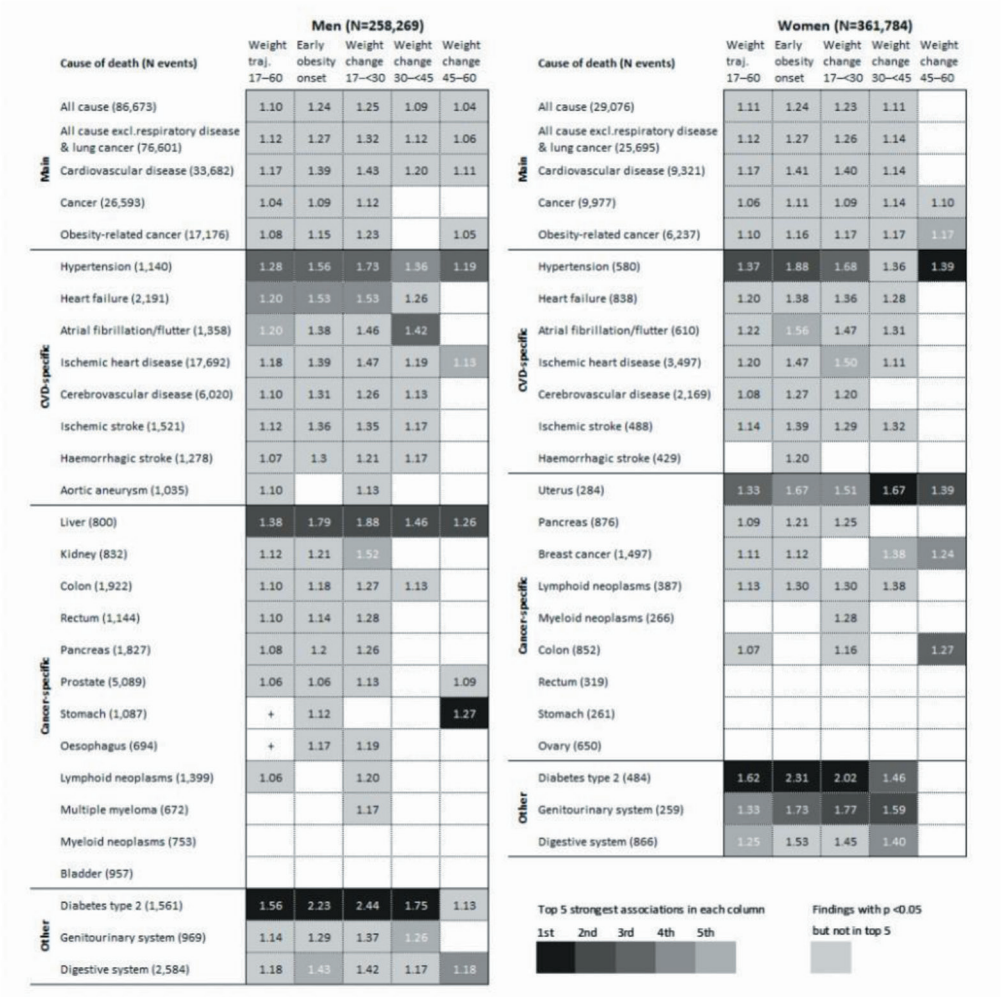


Fig. 1. Weight trajectories between 17 and 60 years of age in men (left) and women (right) in total and in quintiles.

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Black and grey-shaded cells indicate positive associations with a p-value below 0.05, with a gradually darker shade indicated for the top five strongest associations in each analysis, as represented by columns. The Weight trajectory column indicates higher mortality risk per higher quintile level of weight trajectories ages 17–60 years (p-trend <0.05), with numbers showing hazard ratios (HRs) of mortality per higher quintile. Symbols (+) denote a p-trend >0.05 but an increased mortality risk for quintile 5 vs. quintile 1. The Early obesity onset column indicates an increased mortality risk for younger age of obesity onset (p-trend <0.05 across 17–<30, 30–<45, 45–60 years, or never developing obesity before age 60 years), with numbers showing HRs of mortality per younger categorical age of obesity onset. The Weight change at 17–<30, 30–<45 and 45–60 years columns indicate an increased mortality risk per 0.5 kg/year weight change in the respective age intervals.

Fig. 2. Summary findings of adulthood weight change in relation to all-cause and cause-specific mortality in men (left) and women (right).

PO2.069

Food Addiction in Late Adolescence: Repercussions on Social Dysfunction, Anxiety, and Severe Depression

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Introduction: Food addiction (FA) is a phenomenon that accounts for a significant portion of the eating behaviors observed in individuals with overweight and obesity from a behavioral perspective. Interventions targeting changes in dietary and physical activity habits often have effects that diminish over time. Attention has shifted towards psychological factors, for instance, the reinforcing properties of certain foods (Morales & Berridge, 2020; Baik, 2021) or the tendency to regulate emotions through eating (Van Strien, 2018). Within this context, the concept of FA) has become increasingly relevant as an explanation for disordered eating behaviors. FA is considered both a behavioral and substance addiction (Meule, von Rezori, & Blechert, 2014). FA is defined as a chronic and recurrent condition characterized by the compulsive seeking and consumption of certain foods despite their harmful physical and mental health consequences (Agüera et al., 2015). Certain biological (Kupra et al., 2024), behavioral and psychological (Dejavitte et al., 2025) parallels do exist with addictions. Therefore, the complementary study of eating behaviors, such as food addiction, is proposed to gain deeper insights into the origins of obesity.
Method: The sample was selected using the non-probabilistic snowball sampling method through a link shared on social media (WhatsApp and

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Instagram). Participants subsequently completed an online questionnaire, reporting their demographic data. The sample of 522 participants in late adolescence was selected (mean age = 19.68).The scales used were the Yale Food Addiction Scale 2.0 (YFAS 2.0) (Gearhardt et al., 2016), which assesses symptoms associated with substance use disorders (APA, 2014) adapted to food consumption, and the General Health Questionnaire-28 (GHQ-28), which evaluates anxiety and insomnia, severe depression, somatic symptoms, and social dysfunction, were used (Lobo, Pérez-Echeverría, & Artal, 1986).

Results: The sample was divided in FA and non-FA. Adolescents identified with FA exhibited significantly higher levels of anxiety (M = 3.59; SD = 2,35) than non-FA (M = 2.15; SD = 2.34) (t = 6; p = >0.01), social dysfunction (FA M = 2.15; FA SD = 1.4; Non-FA M = 1.16; SD = 1.74) (t = 6.27; p = >0.01), and severe depression compared to their peers (FA M = 1,5; FA SD = 1.34; Non-FA M = 0.63; SD = 1.9) (t = 5.4; p = >0.01).

Conclusion: There is growing interest in the study of FA and its effects on various populations. This study contributes to this growing field by observing differences in populations with FA and examining how the dimensions of the scales used interact to establish a relationship with mental health. Improved understanding of FA will help validate it as a condition and apply this knowledge in further research to develop treatments and models that assist affected individuals from a multicomponent framework, including psychological and behavioral aspects.

PO2.070

Eating behaviors following bariatric surgery in poor, average, and super responders

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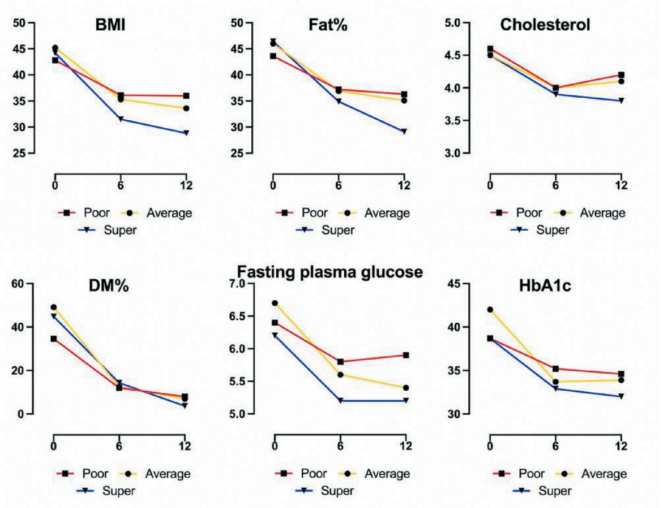
Introduction: Bariatric surgery is the most effective intervention for obesity, resulting in significant and enduring weight loss. However, the role of eating behavioral factors in weight loss success is unclear. This study aimed to investigate eating behaviors over 12 months following bariatric surgery in poor, average, and super responders based on total weight loss percentage.

Methods: We examined eating behaviors through validated questionnaires (Three-Factor Eating Questionnaire, Dutch Eating Behaviour Questionnaire and Binge-Eating Scale) in 112 bariatric surgery patients, 53 operated by Roux-en-Y gastric bypass and 59 by One-Anastomosis gastric bypass. Body weight, body composition, and metabolic features (blood samples and OGTT) were measured. Based on their total weight loss (TWL) percentage at 12 months, participants were divided into three groups: 1) poor (TWL<20%, n=26), 2) average (20%≤TWL< 30%, n= 57) and 3) super (TWL≥ 30%, n=29) responders. Group comparisons were conducted at baseline, 6 months and 12 months. Sex-adjusted linear mixed models were used to assess group and timepoint differences.

Results: At baseline, the poor responders had lower BMI (mean±SD 42.8±5.5 vs 45.2±6.0 vs 44.2±5.5) and more male participants (46% vs. 19% in average, 24% in super responders) compared with other groups. Lipid profiles and glucose metabolism improved similarly in average and super responders, while poor responders showed less improvements in fasting plasma glucose, Hba1c and HOMA-index.

Super responders had the highest baseline scores for cognitive restraint of eating (poor vs super p=0.043) while poor responders had the highest scores for internal locus for hunger (TFEQ) (poor vs average p=0.003 and poor vs super p=0.029). Super responders demonstrated the greatest decreases in rigid control (poor vs super p= 0.043 and average vs super p=0.033) and in restrained eating (DEBQ) (poor vs super p= 0.015 and average vs super p=0.005) over 12 months. During the follow-up, both hunger and disinhibited (over)eating decreased significantly and similarly across all groups. Additionally, emotional eating and external eating (DEBQ) decreased in average and super responders (p<0.001) but not in poor responders over 12 months. Binge-eating score declined in all groups, with poor responders showing the smallest reductions.

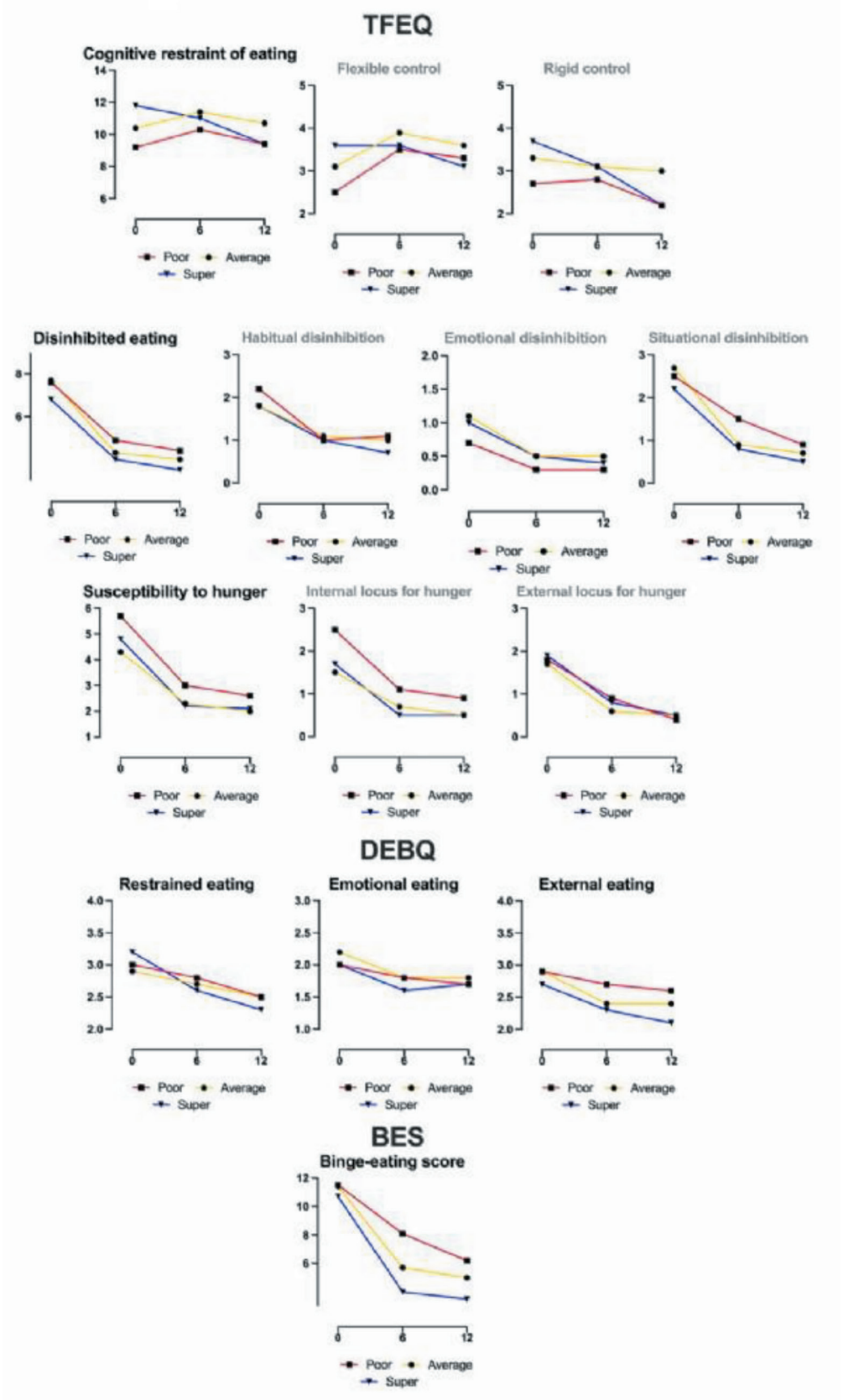
Conclusions: Average and super responders to bariatric surgery showed similar baseline characteristics and comparable metabolic and behavioral improvements, except that super responders required less restrained eating. In contrast, poor responders exhibited stronger internal hunger signals, lower cognitive restraint, were more often male, and had lower baseline BMI. Unlike other groups, they showed no improvement in emotional eating or external cue-driven overeating during weight loss.



Abbreviations: BMI, body mass index; fat%, body fat percentage; DM%, percentage of participants with type 2 diabetes.

Fig. 1. Anthropometric and metabolic characteristics in poor, average, and super responders to bariatric surgery at baseline, 6 and 12 months.

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The primary variable in the graphs are colored black and the subscale graphs are colored grey. Abbreviations: TFEQ, Three-Factor Eating Questionnaire; DEBQ, Dutch Eating Behavior Questionnaire; BES, Binge-Eating Scale.

Fig. 2. Eating behaviors in poor, average, and super responders to bariatric surgery at baseline, 6 and 12 months.

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PO2.071

Lifestyle and psychosocial causes of obesity in the Dutch population stratified by socioeconomic position

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Introduction: Obesity has a wide variety of potential underlying causes, including lifestyle-related, medical, hormonal, genetic, social, and psychological factors. Moreover, it is known that socioeconomic position (SEP) is inversely associated with obesity. However, it remains unclear whether these individual causes of obesity might differ within SEP. This study examined whether lifestyle- and psychosocial related causes of obesity occur differently across SEP.
Methods: To assess the potential underlying causes of obesity, the Dutch version of the Check Causes Obesity questionnaire was used. This validated, comprehensive, online questionnaire is coupled to an algorithm and identifies potential causes of obesity by raising red flags to indicate that in that area conditions may contribute to or maintain obesity. Lifestyle causes include unhealthy dietary habits, physical inactivity, alcohol intake, smoking, drug use, sleep deprivation and shiftwork. Psychosocial causes include e.g. experienced trauma, binge eating, depressive symptoms (or complaints), loneliness, experiencing a low quality of life and perceived support of others. Three measures of socioeconomic position were used: education level (low/middle/high based on ISCED), employment (yes/no), and Neighborhood SocioEconomic Status (NSES) based on zip codes. Logistic regression analysis and Chi-Squares explored whether the underlying causes of obesity occurred more often within specific SEP levels.
Results: The questionnaire was completed by 10.483 respondents between July and December 2024. Mean age was 53 years, median body mass index was 32.1 kg/m2 and 76.3% was female. Most respondents (97.4%) had a red flag for lifestyle related causes. Overall, respondents with lower education and those who were employed had more red flags raised within the lifestyle related causes (all p:<0.001). The odds of having an alcohol use red flag increased with higher NSES (p=0.007), while odds for having red flags for smoking, drug use and dietary habits as a potential underlying cause decreased (all p<0.006) with higher NSES. Respondents with higher education more often had a red flag for alcohol, while respondents with lower education more often had red flags for smoking, shiftwork and physical activity levels. Unemployed respondents more often had a red flag for alcohol or physical activity, while employed respondents had more red flags for dietary habits. For psychosocial causes, respondents with lower education and those who were unemployed were linked to more red flags within the psychosocial underlying causes of obesity (all p:<0.001). Respondents with higher NSES had lower odds for having red flags within the psychosocial related causes (all p:<0.002). Respondents with lower education had more red flags for all psychosocial causes (all p:<0.002), except for experiencing stress, binge eating, and loneliness. Similar findings were seen in unemployed respondents. Similar findings were found for unemployed respondents.
Conclusion: These results show that lifestyle- and psychosocial related underlying causes of obesity occur differently across the levels of socioeconomic position.

PO2.072

Enhancing self-efficacy in digital weight management: Real world insights

Lawson, V.; Hüttenrauch, N.; Schirmann, F.
Oviva AG

Introduction: Self-efficacy (SE), the belief in one's ability to achieve desired outcomes, is critical for behaviour change. Lower SE is associated with disengagement, suboptimal outcomes in behavioural interventions, lower socioeconomic status, and health inequities (Myers-Ingram et al., 2023; Hardman et al., 2020). Reimbursed digital weight management programmes often serve harder-to-reach populations who report lower SE (Finnie et al., 2023). This study tested whether personalising a reimbursed digital weight management intervention for individuals with lower SE could improve outcomes.
Method: At enrollment, SE was measured using a single-item Likert scale (1–10): "How confident are you in reaching your goal(s) with the Oviva Direkt Programme?" Scores <5 were classified as low SE. Evidence-based behaviour change techniques for improving SE—verbal persuasion, graded tasks, focus on past success, problem-solving, and feedback (West et al., 2019)—were delivered through five weekly tailored messages and human coaching. Participants in a German 12-week digital programme were randomised into an active group receiving SE messages (n=706) or a control group with standard messages (n=708). Groups were balanced for gender, age, and SE distribution.
Results: By week 12, participants in the active group achieved significantly greater weight loss (4.9% vs. 3.9% in the control group). Self-reported SE in the active group increased from 4.34 to 5.76. Attrition rates were similar across groups, with 12-week data collected for 22.5% (active) and 21.4% (control).
Graph 1: Differences in reported weight loss between active and control groups from weeks 1-12.

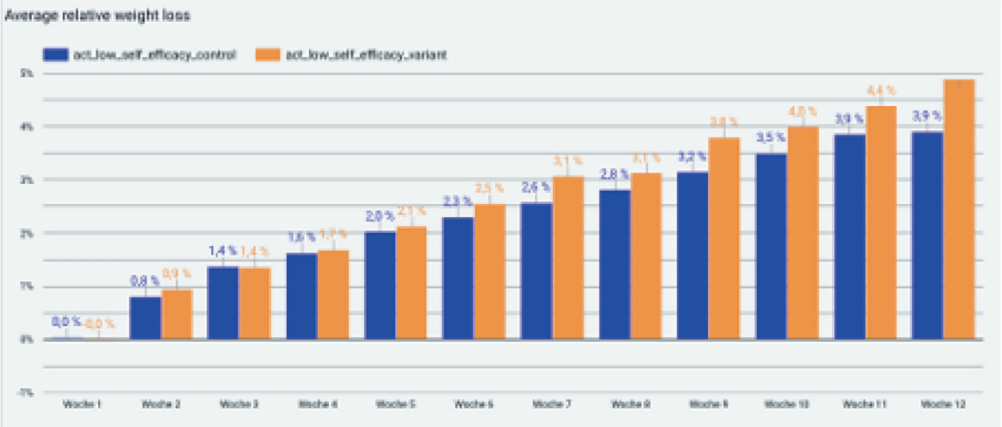


Fig. 1. Graph 1: Differences in reported weight loss between active and control groups from weeks 1-12.

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Conclusion: Tailored SE messaging and coaching were associated with improved weight loss and participant empowerment through increasing SE. These findings highlight the value of personalising digital interventions to address health inequities and support sustainable behaviour change and warrant further research.

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PO2.073

Evaluation of the effectiveness of a school-based intervention to promote fruit and vegetable consumption among primary school children: study protocol

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Introduction: Globally, diets low in fruits and vegetables (FV) rank third and ninth as leading dietary risk factors for disability-adjusted life years. In Portugal, 73% of children aged 3–9 years do not meet the WHO recommendations for FV consumption. Childhood eating habits may influence long-term health, with higher FV consumption in childhood linked to lower rates of non-communicable diseases and cardiovascular mortality in adulthood. Schools are ideal settings for fostering healthy eating behaviors, having the potential to reach the entire school community. The "Fruit Heroes®" project is a school-based intervention designed to promote daily FV consumption using educational materials and non-formal education techniques, such as storytelling and gamification. This study aims to evaluate the effectiveness of this intervention in promoting FV consumption among primary school children at post-intervention and six-month follow-up.
Methods: A two-arm randomized controlled trial will be conducted, with schools as the unit of trial randomization. Participants will be recruited from public and private schools in Portugal (mainland). In each NUTS II, schools will be randomly assigned to the intervention or the control group using computer-generated random numbers. All children in each school will be invited to participate. Inclusion criteria are being enrolled in primary education (1st to 4th grades) and having parental consent to participate. Children with cognitive impairment or developmental disabilities will be excluded. The intervention group will participate in daily 15-minute classroom activities for five weeks, where teachers will read or play an audio version of a playful-pedagogic tale of the Fruit Heroes' characters who gain "superpowers" through the consumption of healthy foods, encouraging children to consume FV. Children earn points each day they eat fruits or vegetables, motivating them to repeat the behavior daily. The control group will not receive any intervention. Considering a 95% confidence interval and a prevalence of 27% of Portuguese children currently meeting FV consumption recommendations, the minimum sample size is estimated at 862 children (431 per study arm), accounting for a 20% attrition rate.
Results: The primary outcome is FV consumption, assessed by the number of FV portions eaten on the previous day (two evaluations per week), at three time points: baseline, post-intervention, and six months after the intervention. The hypotheses are: (1) the difference in the percentage of children meeting the national FV consumption recommendations post-intervention and follow-up assessment will be higher in the intervention group, compared to the control; and (2) the percentage of children increasing FV consumption post-intervention and follow-up assessment is higher in the intervention group, compared to the control.
Conclusion: This study will provide evidence about the effectiveness of a widely established school-based intervention with a high capacity for implementation/replication. Formal assessment of its impact is crucial, as it allows for evidence-based validation of its continued usefulness in real-world settings.

PO2.074

A Content Analysis of TikTok Videos on Food Noise

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Introduction: Food Noise has recently emerged in media, social media, and reports from patients and clinicians to describe rumination and obsessive preoccupation about food and eating. Google Trends data show interest in the topic starting in 2023, with an all-time high in December 2024. A theoretical definition of "Food Noise" has recently been established as "heightened and/or persistent manifestations of food cue reactivity, often leading to food-related intrusive thoughts and maladaptive eating behaviors," but research focusing on the lived experiences of people who report experiencing it is limited. TikTok, an online short video-sharing platform with over one billion estimated users (mostly children, teenagers, and emerging adults), has become a major outlet for content creators to disseminate information on Food Noise, with over 3600 videos under the hashtag #FoodNoise as of June 2024. This study aimed to examine the top videos on TikTok under the hashtag "FoodNoise" and explore what content creators discuss around food noise.
Methods: We analyzed the top 100 videos on TikTok under the hashtag #FoodNoise. Video links and metadata (such as engagement metrics) were retrieved on June 24th, 2024. After one duplicated video was excluded, the final analysis included 99 videos. Following pilot testing of the codebook, we conducted a quantitative content analysis of the videos. This study required no ethical approval
Results: The sampled videos had a mean of 8154.57 likes, 246.99 comments, and 582.65 shares. Content creators were mostly female (91.9%), emerging or older adults (17.2% and 82.8%, respectively), and White (85.9%). 22.2% of content creators were healthcare professionals, and 70.7% of videos were patient testimonies. 49.5% of videos mentioned medications (91.8% were related to GLP-1RA-based drugs, such as semaglutide and tirzepatide), and sponsored content was disclosed in 5.1% of videos. Of the videos that defined Food Noise (82.8%), 93.9% defined it consistently with the current theoretical definition. Most videos (85.9%) depicted food noise negatively.
Conclusion: Content related to Food Noise is abundant on TikTok; it drives substantial engagement and is mainly driven by patient testimonies. Food Noise is mostly depicted as a negative phenomenon that causes suffering and loss of quality of life, and most content creators define it consistently with current scientific literature. Reference to the use of medications is abundant, mainly GLP-1RA-based therapies used to treat obesity. These findings contribute to understanding what TikTok content creators refer to when using the term Food Noise to describe their lived experiences, and future research should expand analyses to other forms of media and social media.

Conflict of Interest: None disclosed

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PO2.075

Assessment of weight change and all-cause mortality based on BMI intervals in South Korea: A 12-year follow-up of the Korea Longitudinal Study of Aging

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Introduction: Obesity and weight loss are associated with increased mortality. Understanding the association between weight change and mortality is critical and can help inform effective prevention and intervention strategies. Therefore, this study aimed to investigate the association between weight change and mortality based on body mass index (BMI) intervals using data from a 12-year follow-up survey in Korea.

Methods: We used data from the Korea Longitudinal Study of Aging from 2006 to 2018. Individuals aged 45–69 years without a history of malignancy and chronic obstructive pulmonary disease at baseline were selected. Cox regression analysis was used to compare mortality based on BMI and weight change.

Results: Compared with individuals with a BMI of 20–25 kg/m2 and an increase in body weight of <5 kg, mortality was 3.8 times higher in the group with a BMI of <20 kg/m2 and a weight loss of <5 kg, 2 times higher in the group with a BMI of 20–25 kg/m2 and weight loss of >10 kg, and 4.3 times higher in the group with a BMI of ≥25 kg/m2 and weight gain of ≥10 kg.

Conclusions: Weight loss in underweight or normal-weight individuals and weight gain in individuals with obesity increased the mortality rate compared with individuals with normal weight and less weight change. This suggests that body weight and the changes in the weight of individuals are crucial, and weight loss in patients with underweight and weight gain in patients with obesity are closely related to increased mortality.

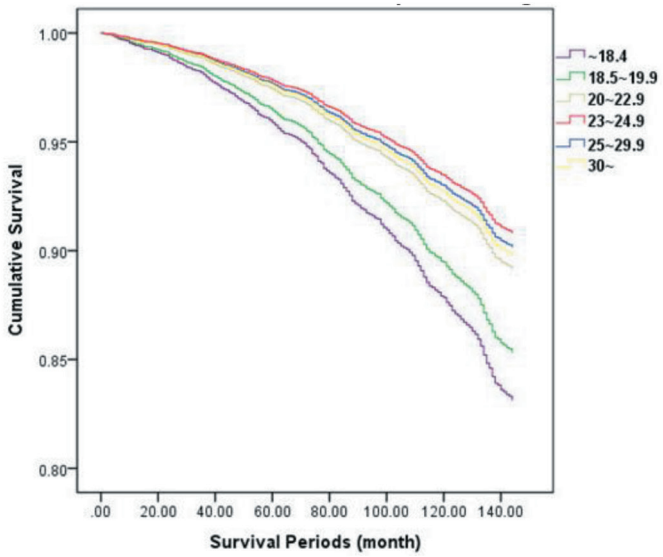
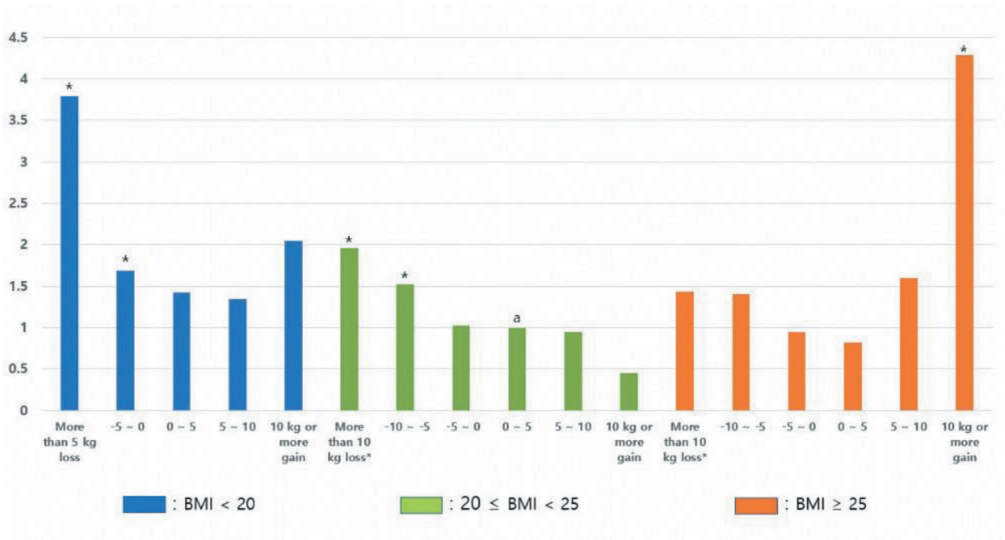


Fig. 1. Cumulative survival rate by Cox regression analysis (raw data).



BMI: body mass index. *: Data with a P-value less than 0.05. a: Reference of hazard ratio.

Fig. 2. Hazard ratio according to weight change for first 2 years by obesity degree (10 years follow-up mortality).

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Tab. 1. General Characteristics.

Variables	≤18.4 BMI (N = 167)	18.5–19.9 BMI (N = 427)	20.0–22.9 BMI (N = 2585)	23.0–24.9 BMI (N = 2249)	25.0–29.9 BMI (N = 1643)	≥30.0 BMI (N=134)	P-value
Age	58.8 ± 7.83	56.0 ± 8.12	56.1 ± 7.52	56.5 ± 7.41	56.7 ± 7.02	57.9 ± 7.54	0.000*
Sex-Male	58 (34.7%)	161 (37.7%)	1142 (44.2%)	1106 (49.2%)	744 (45.3%)	33 (24.6%)	0.000†
Sex-Female	109 (65.3%)	266 (62.3%)	1443 (55.8%)	1143 (50.8%)	899 (54.7%)	101 (75.4%)	
MMSE	25.1 ± 5.66	26.9 ± 3.71	26.9 ± 3.77	27.2 ± 3.44	26.8 ± 3.71	25.7 ± 4.37	0.000
Hypertension	22 (13.2%)	49 (11.5%)	425 (16.4%)	525 (23.3%)	526 (32.0%)	78 (58.2%)	0.000†
Diabetes	19 (11.4%)	24 (5.6%)	214 (8.3%)	231 (10.3%)	221 (13.5%)	38 (28.4%)	0.000†
Liver disease	1 (0.6%)	7 (1.6%)	44 (1.7%)	25 (1.1%)	39 (2.4%)	3 (2.2%)	0.056†
Cardiac disease	6 (3.6%)	10 (2.3%)	69 (2.7%)	82 (3.6%)	74 (4.5%)	9 (6.7%)	0.006†
Cerebrovascular disease	9 (5.4%)	8 (1.9%)	52 (2.0%)	48 (2.1%)	53 (3.2%)	3 (2.2%)	0.111†
Regular exercise	50 (29.9%)	149 (34.9%)	1064 (41.2%)	970 (43.1%)	764 (46.5%)	44 (32.8%)	0.000†
Current smoker	46 (27.5%)	103 (24.1%)	572 (22.1%)	483 (21.5%)	334 (20.3%)	16 (11.9%)	0.013†
Alcohol consumption	58 (34.7%)	171 (40.0%)	1071 (41.4%)	1003 (44.6%)	712 (43.3%)	41 (30.6%)	0.002†

Values are presented as the mean ± standard deviation or number (%). *Analyzed using analysis of variance. †Analyzed using the chi-square test. BMI, body mass index; MMSE, mini-mental state examination

Tab. 2. Cox regression analysis for mortality according to BMI (12 years follow-up).

	Model 1		Model 2	
	Risk ratio	P value	Risk ratio	P value
≤18.4 BMI	1.910 (1.313–2.777)	0.001	1.631 (1.116–2.384)	0.012
18.5–19.9 BMI	1.534 (1.166–2.019)	0.002	1.582 (1.199–2.088)	0.001
20.0–22.9 BMI	1.121 (0.946–1.329)	0.187	1.156 (0.974–1.372)	0.097
23.0–24.9 BMI*	1.000	-	1.000	-
25.0–29.9 BMI	1.028 (0.846–1.249)	0.781	0.996 (0.819–1.212)	0.970
≥30.0 BMI	1.182 (0.712–1.962)	0.517	1.072 (0.643–1.787)	0.791

Values are presented as the hazard ratio (95% confidence interval). 1.000: reference. Model 1: raw data; Model 2: adjusted by age, sex, hypertension, diabetes, liver disease, cardiac disease, cerebrovascular disease, regular exercise, current smoker, alcohol drink. *: reference.

Tab. 3. Cox regression analysis for mortality according to weight change for first 2 years (10 years follow-up).

Weight change	Risk ratio	P-value
>10.0 kg loss	1.859 (1.292–2.673)	0.001
-5.1 to -10.0 kg	1.495 (1.131–1.977)	0.005
-0.1 to -5.0 kg	1.059 (0.870–1.290)	0.565
+0 to 4.9 kg*	1.000	-
+5.0 to 9.9 kg	1.145 (0.778–1.685)	0.491
≥10.0 kg gain	1.228 (0.627–2.406)	0.549

Values are presented as the hazard ratio (95% confidence interval). *: reference.

PO2.076

Associations between primary food sources of saturated fat and body composition: a cross-sectional and longitudinal study in the UK Biobank cohort

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Introduction: Saturated fatty acids (SFAs) from various food sources may be differentially linked with poor cardiometabolic outcomes, which may be partly explained by differences in body composition and the muscle-to-fat distribution. 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

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cross-sectional and longitudinal associations with body composition measures across these dietary groups.
Methods: A sample of n=107,758 participants from UK Biobank who completed at least two 24-hour dietary assessments were classified based on their average daily consumption (g/day) of food groups and ranked as: 1) Dairy products (n=10,516), 2) Red/processed meat (n=26,438), 3) Desserts (n=46,425) or 4) Combinations of these (n=24,379). Body composition including body mass index (BMI), appendicular muscle mass, fat mass and muscle-to-fat ratio was measured using bioimpedance, and a subsample of participants (n=24,999) had repeated measures at follow up. Multivariable linear regressions were used to estimate adjusted means (95% CIs) for each body composition measure according to SFA group, including demographic, lifestyle, and dietary confounders.
Results: BMI (kg/m2) was highest in the red/processed meat group (27.2, 95%CI 27.1 to 27.2) and lowest in the dairy group (25.6, 95%CI 25.5 to 25.7). Appendicular muscle (kg) was significantly lower in the dairy group (21.8, 95%CI 21.7 to 21.8) compared to the red/processed meat group (22.4, 95%CI 22.3 to 22.4). Fat mass (kg) was highest in the red/processed meat group (24.8, 95%CI 24.7 to 24.9), while the muscle-to-fat ratio was highest in the dairy group (1.14, 95%CI 1.13 to 1.15) and lowest in the red/processed meat group (1.02, 95%CI 1.02 to 1.03). Over an average of 8 years of follow-up, all groups had similar declines in appendicular muscle mass (kg). However, there were different increases in fat mass (kg), with the highest gain found in the red/processed meat group (0.7, 95%CI 0.6 to 0.8), followed by the desserts group (0.6, 95%CI 0.5 to 0.6) and the dairy group (0.4, 95%CI 0.2 to 0.5).
Conclusion: A higher consumption of red/processed meats is associated with a higher BMI, fat mass, and a lower muscle-to-fat ratio at baseline as well as a higher fat mass gain at follow-up, indicating a less favorable body composition profile. Conversely, higher dairy consumption was associated with a lower BMI, lower fat mass, and a more favorable muscle-to-fat ratio. These findings underscore the importance of targeting different sources of SFAs in dietary recommendations for improving body composition and cardiometabolic health.

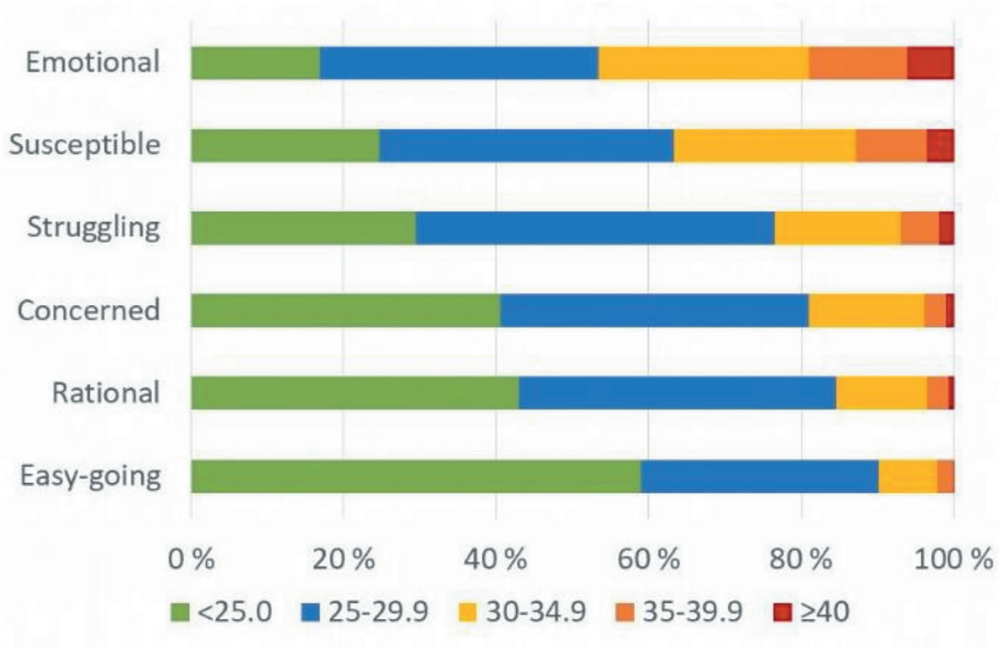
PO2.077

Eating behavior profiles, body mass index and temperament – Northern Finland Birth Cohort 1966

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Introduction: Eating behavior plays a key role in weight management. It is well known that uncontrolled (UE) and emotional eating (EE) are associated with weight gain and obesity. Instead, the role of cognitive restraint of eating (CR) is unclear; higher CR has been associated with successful weight loss and maintenance, but also with weight gain. This suggests that the interactive occurrence of individual dimensions of eating behavior should also be known. In a previous study, the profile of low scores in CR, UE and EE was associated with lower body mass index (BMI) compared to other eating behavior profiles. In addition, four distinct eating behavior profiles were found in general Finnish and German populations, named "easy-going", "rational", "susceptible", and "struggling" eaters. The aim of this study was to identify the profiles of eating behavior and describe their associations with BMI and temperament among middle-aged population.
Methods: A population-based Northern Finland Birth Cohort included 5764 subjects (females 56%) at age 46 years. Eating behavior dimensions



Body mass index classified in the eating behavior profiles in the Northern Finland Birth Cohort 1966 at age 46 (n=5761).

Fig. 1. BMI classification in the eating behavior profiles.

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Mean scores (0–100) of eating behavior dimensions in eating behavior profiles in the Northern Finland Birth Cohort 1966 at age 46 (n=5764).

Fig. 2. Eating behavior profiles.

were assessed using the revised Three-Factor Eating Questionnaire -18, which measures CR, UE, and EE. Eating behavior profiles were identified using k-means cluster analysis. Measured body weight and height, or if missing, self-reported data was used for calculating BMI. Temperament was assessed by the Temperament and Character Inventory which measures four traits: harm avoidance (HA), novelty seeking (NS), reward dependence (RD; sociability-related reward-seeking), and persistence (P). The differences between the profiles were analyzed using one-way analysis of variance.

Results: Six different eating behavior profiles were identified and named as "easy-going" (n=1236, 21% of which females 39%), "rational" (n=1314, 23%, females 59%), "concerned" (n=1103, 19%, females 47%), "struggling" (n=1025, 18%, females 72%), "susceptible" (n=662, 11%, females 58%), and "emotional" (n=424, 7%, females 79%). In the "easy-going" profile, all three dimensions were at low levels, whereas in the "emotional" profile UE and EE were at an extremely high level and CR at an intermediate level. The other profiles were various combinations of CR, UE, and EE ("rational": high CR, low UE and EE; "concerned": intermediate CR, UE and EE; "struggling": high CR and EE, intermediate UE; "susceptible": intermediate CR, high UE and EE). The mean BMI was the lowest in the "easy-going" profile (24.8 kg/m^2, SD 4.1) and the highest in the "emotional" profile (30.4 kg/m^2, SD 6.6). The "easy-going" and "rational" profiles were mainly quite similar in terms of temperament traits, but the "easy-going" profile had lower RD. In the "emotional" profile, HA and its subscales and sentimentality (subscale of RD) were at higher levels than in the other profiles.

Conclusion: Altogether six distinct eating behavior profiles were found, including two new: "concerned" and "emotional". These profiles differed also in terms of temperament traits. Better understanding of interactions of eating behavior and temperament could support developing more tailored treatment to individuals with challenging in body weight management.

PO2.078

Perceptions and opinions of people diagnosed with obesity in the Spanish public national health system: insights from the OBERview360 study

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Introduction: OBERview360 study aims to explore the perceptions and experiences of people with obesity (PwO) in Spain regarding their condition and the healthcare services received within the public national healthcare system.

Methods: cross-sectional observational study using a questionnaire to PwO attending obesity consultations with specialists in Endocrinology and Nutrition, Internal Medicine, and Family and Community Medicine selected for their expertise in obesity and representing all the Autonomous Communities, and to ABHíspalis associates. The questionnaire was developed with a committee comprising representatives from each medical specialty and an expert patient. Patients who voluntarily agreed to participate completed a questionnaire between June and July 2024 during their consultation electronically or on paper, based on their preference. The questionnaire consisted of 19 items with single-response, multiple-response, and open-field questions. Percentages indicate the proportion of respondents selecting each option.

Results: 357 PwO participated: 227 women (63.6%), and >50% aged over 50 years. 76.8% indicated that "obesity is a chronic disease influenced by multiple factors that requires treatment," while 22.1% considered it "a condition associated with lifestyle habits". The primary motivation for PwO pursuing care was general discomfort regarding their health or image (30.8%), followed by difficulty in performing daily activities (24.1%). Main obesity treatment goal was to improve health status, particularly concerning comorbidities such as cardiovascular diseases or diabetes

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(40.6%). Family and community medicine specialists made the initial recommendation to treat obesity (54.9%), followed by endocrinologists (20.4%). 85.2% reported receiving recommendations related to lifestyle and healthy living habits, 44.3% pharmacological treatment, and 21.8% bariatric surgery. 52.1% of respondents reported difficulties adhering to lifestyle and healthy living habit changes, mainly due to incompatibility of recommendations with their existing lifestyle (32.8%), lack of motivation or confidence to engage in physical activity (30.6%), or the long-term commitment required (30.1%). For those experiencing difficulties with pharmacological treatments (11.2%), 60.0% cited high costs not covered by the Spanish national health system as the primary obstacle, followed by treatment associated side effects (25.0%). Overall, 28.9% and 27.5% reported not receiving psychological and nutritional support, respectively, despite considering it essential. Motivation (42.3%) and frustration (40.3%) were the most frequently experienced feelings. More than 50% of participants rated their communication with healthcare professionals (55.5%), the information received (55.7%), and their overall experience with obesity care (52.4%) as excellent or very satisfactory.
Conclusion: results showcase the opportunity to optimize patient-centered care by tailoring treatment options to minimize barriers and enhancing a comprehensive and multidisciplinary approach, along with continuous follow-up.

Conflicts of interest and funding: Eli Lilly and Company.

PO2.079

A comparison of clinical characteristics of people living with obesity using data from a general practitioners' morbidity registry and a Belgian multidisciplinary obesity center: An IMI2 SOPHIA study

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Introduction and Objectives: There is a lack of knowledge on the prevalence of overweight/obesity related complications in people living with overweight and/or obesity in Belgium. Therefore, we aimed to study and compare the clinical characteristics of individuals consulting general practitioners with a BMI ≥25 kg/m2 and those attending a specialized obesity center at a tertiary hospital.
Methods: Cross-sectional data from 3605 obesity center visitors and 32849 individuals from a general practitioners' morbidity registry with BMI ≥25 kg/m2 was used to determine the prevalence of hypertension, dyslipidemia, prediabetes, type 2 diabetes and sleep apnea. Differences between groups were determined with chi-square tests, using a p-value < 0.05.
Results: In the obesity center, where the average BMI was 39±6.5 kg/m2, 49.1% of the population had multiple overweight/obesity related complications. This was significantly higher than the 34.6% observed in the population from the general practitioners' database ($p<0.001$), which had an average BMI of 30.3±4.3 kg/m2. The prevalence of hypertension (43.1% versus 37.5%, $p<0.001$), dyslipidemia (44.4% versus 32.9%, $p<0.001$) and sleep apnea (37.9% versus 5.5%, $p<0.001$) was higher in the obesity center population. In contrast, the prevalence of type 2 diabetes (15.8% versus 16.9%, p=0,69) and prediabetes (22.1% versus 21.8%, P=0,09) did not differ between both groups.
Conclusion: In comparison to individuals from a general practitioners' morbidity registry with BMI ≥25 kg/m2, hypertension, dyslipidemia and especially sleep apnea were more prevalent in the obesity center after assessment, possibly reflecting the fact that the population from the obesity center had a higher BMI.

PO2.080

How is household food insecurity associated with diet quality? A pre-registered cross-sectional study investigating the role of psychological distress and food choice motives

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Introduction: Household food insecurity (HHFI) – a lack of reliable access to food that is safe, nutritious, and acceptable – is a major public health concern across Europe and beyond. There is a well-established relationship between food insecurity and obesity in women. While the specific biological and behavioural mechanisms accounting for this are not well understood, persons on low incomes are likely to substitute more expensive, healthy foods (e.g., fruits, vegetables, fish) with cheaper energy-dense nutrient-poor options. Previous research also indicates that psychological distress and eating to cope may partly explain the association between food insecurity and higher body weight. To understand potential mechanisms linking food insecurity with diet, the current study examined cross-sectional associations between household food insecurity (HHFI), psychological distress, motives underlying food choices and diet quality.
Methods: A sample of UK adults (N = 594, 96% female, mean age = 40.6 years, mean body mass index (BMI) = 28.95 kg/m²) were recruited to take part in an online questionnaire study. Key variables were quantified using the following validated questionnaires (USDA Household Food Insecurity Survey Module to measure HHFI; 21-item Depression, Anxiety and Stress Scale to measure psychological distress; Food Choices Questionnaire to measure food choice motives; short food frequency questionnaire (FFQ) as a proxy measure of diet quality). Structural equation modelling was used to determine the associations between the variables and analyses were pre-registered (https://aspredicted.org/blind.php?x=j8ui5j). It was hypothesized that HHFI would be associated with greater psychological distress and certain food choice motives (higher motives based on price and convenience and lower motives based on health, weight control and ethical concern) which, in turn, would be associated with poorer diet quality.
Results: The final model was an acceptable-good fit for the data ($X^2/df = 2.74$, CFI =.93, RMSEA =.06, SRMR =.04). HHFI was directly associated with higher food choice motives based on price, but not directly with any of the other food choice motives. HHFI was indirectly associated with poorer diet quality via price motives. Partially in line with predictions, there were significant serial indirect associations between HHFI and diet quality via distress and some of the food choice motives. Specifically, HHFI was associated with greater distress, which in turn was associated with higher convenience motives and lower health motives, which were then both associated with poorer diet quality.
Conclusion: Psychological distress and certain food choice motives (higher motives based on price and convenience, lower health motives) may play a role in the relationship between food insecurity and low diet quality. These findings highlight the need for interventions to support psychological wellbeing in people experiencing food insecurity and for upstream policy changes to make healthy food accessible and convenient for all.

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PO2.081

BMI registration and prevalences of overweight/obesity related complications in a Belgian general practitioners' morbidity registry: An IMI2 SOPHIA study

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Introduction: The prevalence of overweight and obesity has increased 2-fold since 1980, increasing the need for good obesity care. Within obesity care, general practitioners initiate the first treatments and refer individuals to more specialized obesity care on the basis of BMI and the presence of overweight/obesity related complications. Therefore, we investigated the association between BMI registration and the diagnosis of overweight/obesity related complications using a Belgian general practitioners' morbidity registry.
Methods: Cross-sectional data from 208891 individuals from a general practitioners' morbidity registry was used to evaluate BMI registration. Individuals with registered BMI were matched to individuals without registered BMI, on the basis of age, sex and the general practitioner. Data from this subset of 137572 individuals was analyzed to determine the prevalence of overweight/obesity related complications in cohorts with and without a registered BMI. Differences between groups were determined with chi-square tests, using a p-value < 0.05.
Results: BMI was registered in only 25.6% (53555 out of 208891) of the files. When BMI was registered, hypertension (30.1% versus 17%, p <0.001), dyslipidemia (26.9% versus 14.7% p <0.001), prediabetes (17.0% versus 7.9% p <0.001), type 2 diabetes (12.7% versus 4.4% p <0.001), and sleep apnea (3.8% versus 1.5% p <0.001) were significantly more prevalent in the cohort with registered BMI.
Conclusion: There is limited registration of BMI in general practice and the prevalence of overweight/obesity related complications is substantially higher in those with a registered BMI than in those where no BMI is registered.

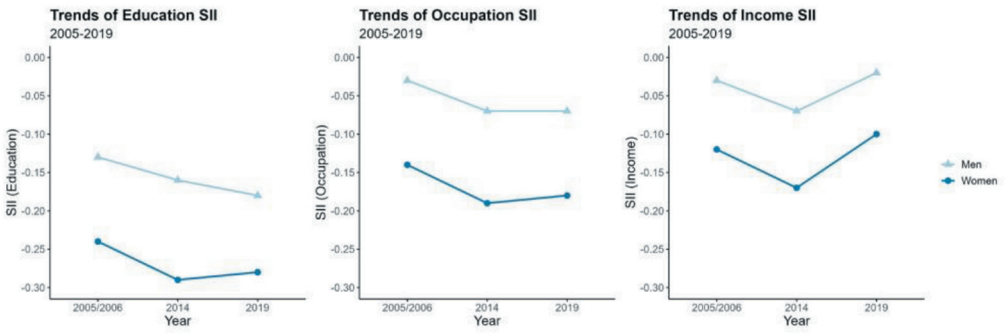
PO2.082

Trends in Socioeconomic Inequalities in Obesity Among Portuguese Adults: Evidence from National Health Surveys (2005–2019)

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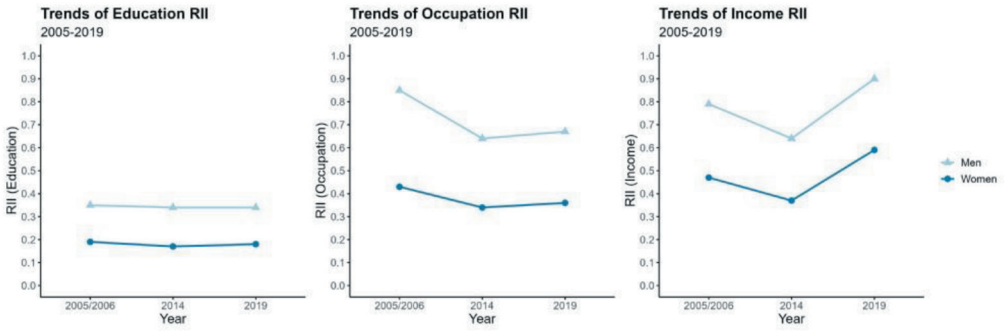
Introduction: Socioeconomic inequalities in obesity are well-documented globally; however, the extent and dynamics of these inequalities in Portugal remain underexplored. We aim to examine trends in socioeconomic inequalities in obesity among Portuguese adults from 2005 to 2019, using data from three waves of the National Health Surveys (NHS).
Methods: We analyzed data corresponding to a total population of 20–64-year adults from the 2005/06 (N=6508833), 2014 (N=6227041), and 2019 (N=6073178) NHS, after applying the weighting factors to ensure national representativity. Socioeconomic position (SEP) was assessed using education (no formal education, 6th, 9th, 12th grades, post-secondary education, and higher education), occupation (unemployed, operations/trade, technical/administrative, and senior professional/managerial), and monthly household income quintiles. Obesity was defined as a body mass index (BMI)≥30 kg/m², derived from self-reported weight and height. Socioeconomic inequalities were quantified using the Slope Index of Inequality (SII) and Relative Index of Inequality (RII) to measure absolute and relative inequalities, respectively. A log-binomial regression model was used to examine the relationship between obesity and socioeconomic indicators, employing an identity link function to calculate SII (absolute differences in predicted obesity prevalence between the highest and lowest socioeconomic group) and log link function to estimate RII (ratio of obesity prevalence between these groups). Trends in SII and RII were analyzed by socioeconomic indicator and sex, with significance set at $p < 0.05$. All analyses were conducted using RStudio®.



Trends of Slope Index of Inequality (SII) of Education, Occupation and Income from 2005/2006 to 2019.

Fig. 1. Trends of Absolute Socioeconomic Inequalities of Obesity, stratified by sex.

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Trends of Relative Index of Inequality (RII) of Education, Occupation and Income from 2005/2006 to 2019.

Fig, 2. Trends of Relative Socioeconomic Inequalities of Obesity, stratified by sex.

Results: SII consistently exhibited negative values, and RII was below 1, highlighting a disproportionate concentration of obesity among adults with lower SEPs. Educational inequalities (SII) increased over time, with each step up in educational level corresponding to a greater reduction in obesity prevalence. For woman, the reduction was 0.24 percentage points in 2005/2006, rising to 0.28 points by 2019, while for men, the reductions were 0.13 and 0.18 points, respectively. Occupational inequalities increased slightly from 2005/2006 to 2019 [women: SII (95%CI)=-0.18 (-0.13;-0.12); men: -0.07(-0.12;-0.02)]. Income-related inequalities peaked in 2014 and then declined by 2019 among women [-0.10(-0.15;-0.04)] and men [-0.02(-0.09;-0.02)]. Relative trends (RII) followed similar patterns, except for education, where relative inequalities remained stable over the 14 years. In 2019, women with higher education had an 82% lower obesity risk than those with no formal education [RII (95%CI)=0.18(0.12;0.25)], while men experienced a 66% lower risk [0.34(0.23;0.52)]. Occupational and income-related RII increased between 2005/2006 and 2014 but declined by 2019, remaining statistically significant only for women [occupation: 0.36(0.25;0.50); income: 0.59(0.43;0.82)].
Conclusion: Socioeconomic inequalities in obesity persist in Portugal, with women consistently facing greater disparities than men. These findings underscore the need for targeted strategies to address both socioeconomic and gender gaps in obesity.

PO2.083

The Non-Linear Relationship Between Visceral Fat and Low Back Pain Intensity: A Focused Analysis of Central Obesity

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Introduction: Low back pain (LBP) is a prevalent condition with far-reaching consequences for public health, healthcare systems, and workforce productivity globally. Among the numerous risk factors associated with LBP, abdominal obesity has been identified as an independent contributor. Despite growing evidence supporting this association, the precise nature of the relationship remains insufficiently explored. Further investigation is required to understand how central obesity contribute to the onset and progression of LBP. Therefore, the aim of this study was to determine whether a measurable interconnection exists between central obesity and LBP intensity and to assess the potential impact of central obesity on pain severity.
Methods: Anthropometric measurements (body weight, body length, BMI, waist circumference, waist-to-hip ratio, and waist-to-height ratio) and bioelectrical impedance analysis (BIA, Tanita Europe GmbH, MC 780 MA P, Japan) were employed to evaluate the impact of central obesity and visceral fat on LBP intensity among twenty participants with obesity or overweight (10 males, 10 females; mean age 45 ± 11.4 years; mean height 170 ± 8.63 cm; mean body mass 91.3 ± 19.2 kg; BMI 31.7 ± 5.31 units). Additionally, the Oswestry Disability Index (ODI) was used as a validated survey tool to assess LBP severity. Statistical analyses included the Shapiro-Wilk test to assess normality and Spearman's rank correlation to evaluate associations between ODI scores and all collected parameters. Among the analyzed metrics, visceral fat demonstrated the strongest correlation with ODI scores (Spearman's rho = 0.663, p = 0.001), leading to its selection as the primary focus for further analysis. A multiple linear regression model, incorporating linear and quadratic terms for visceral fat, was used to explore non-linear relationships. Analyses and visualizations were performed in Jamovi 2.3.28.
Results: The correlation analysis revealed a significant positive association between visceral fat and low back pain intensity, as measured by ODI scores (Spearman's rho = 0.663, p = 0.001). Visceral fat demonstrated the strongest correlation with ODI scores compared to other anthropometric parameters. A multiple linear regression model, incorporating linear and quadratic terms for visceral fat, explained 43.2% of the variance in ODI scores (Adjusted R^2 = 0.432). The quadratic term indicated a non-linear relationship, suggesting that the impact of visceral fat on LBP intensity increases up to a threshold before diminishing.
Conclusion: The observed non-linear relationship, where LBP intensity increases with visceral fat levels up to a threshold before diminishing, may reflect biomechanical or physiological adaptations. These findings underscore the complexity of the interaction between visceral fat and LBP and suggest that its role is dynamic rather than uniformly progressive.

Conflict of Interest: None Disclosed

Funding: SNSF (SAR) Grant number: IZSEZ0_216740

PO2.084

"*Could be anything, right?*" A qualitative study on the awareness of obesity in the general public

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Objective: Higher health awareness in the general public can positively influence health outcomes. A higher obesity awareness could promote help-seeking behaviour, help breaking stigma and optimise communication between patients and their healthcare providers, yet the exact awareness gaps on obesity in the general public remain largely unknown. Therefore, this study aimed to explore the awareness regarding obesity among the general public.

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Methods: A cross-sectional qualitative study was conducted in adults (age >= 18 years old) of the general public, not living with overweight or obesity (BMI < 25). Adults were randomly recruited at public train stations in Belgian cities: Ghent, Brussel and Jette.
The semi-structured interviews were conducted both face-to-face and online in Dutch, French or English.
Using a explorative thematic analysis, themes were emerged and categorized on whether participants perceived obesity as a disease or not.
Results: A total of 24 participants (mean age 33.5 years (SD = 16.1), 54% female, mean BMI 21.6 (SD = 5.1) were recruited
This study uncovered contrasting participant's views on whether obesity should be classified as a disease. Four themes emerged after analysis of the interviews: causes, responsibility, clinical management and consequences. Participants who did not perceive obesity as a disease mainly attributed obesity to an imbalance between food intake and physical activity. These individuals considered behavioural support as sufficient treatment. Besides personal accountability as a central factor, they also reported parental and societal responsibility. "*It is more the way that that you live your life. Perhaps through exercise and proper nutrition you should be able to treat that*" – participant 22.
Other participants seemed to comprehend the biological mechanisms that drive the onset of obesity. These participants considered healthcare professionals responsible for the patient's health and suggested a medical and multidisciplinary approach: "*I do think that it requires medical supervision. Because in my opinion, it's a serious issue*" – participant 5.
All participants emphasized a variety of consequences associated with obesity including health, physical, psychological and socio-economic challenges. "*People who struggle with obesity may have fewer social contacts because of the shame and insecurities etc. So, the likelihood of depression is higher*" – participant 10.
Conclusion: The results of this research disclosed several knowledge gaps that can be turned into actionable insights for future obesity awareness campaigns. Firstly, focussing on the biological nature of the disease can stimulate people to seek help and decrease stigma concerning this condition. Secondly, obesity initiatives should emphasize the importance of multidisciplinary care.
This sample may not fully represent the perceptions of the broader general public, particularly those with higher BMIs or from older age groups.

Conflicts of interest: None disclosed

Funding: No funding to report

PO2.085

School children's daily routine and physical activity in Ukraine in 2023-2024, as evidenced by WHO European Childhood Obesity Surveillance Initiative (COSI)

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[4]WHO Country Office in Ukraine
[5]GFA Consulting Group GmbH

Introduction: Physical activity, enough sleep and healthy meals are essential for development and adaptation to social challenge and stressors, for example during the war in Ukraine. WHO recommends that children have at least 60 minutes of moderate to vigorous physical activity per day. The Sanitary Regulations for General Secondary Education Institutions of the Ministry of Health of Ukraine do not recommend home assignments for pupils of grades 1-2. The national school meals reform also promotes nutrition for healthy lifestyle and entitles pupils of grades 1-4 for free school meals.
In 2023 Ukraine joined the WHO European Childhood Obesity Surveillance Initiative (COSI) for the first time. The COSI study aimed to estimate the prevalence of childhood overweight and obesity and health determinants such as eating habits and physical activity.
Methods: The study collects nationally representative data on children aged 6.0-9.9 years. In Ukraine these were children in grades 1-2 of elementary school, using standardized measurements of height and body weight, as well as interviews with parents and school representatives. This abstract provides an overview of the 1st round of COSI in Ukraine, focusing on children's physical activity and daily routine.
Results: On weekdays, 94.5% of Ukrainian children aged 6-8 spend at least 1 hour a day on moderate-intensity activities (running, jumping, playing sports, dancing, physical, active games). On weekends, this figure is the same (94.4%), but the duration of activity increases: while on weekdays 50.9% spend 2-4 hours a day, on weekends 50.7% spend 4 hours or more.
31.1% of children never engage in high-intensity physical activity (sports, exercise, dancing in sports clubs, health clubs, fitness centers, dance studios) or spend less than 1 hour per week on it, 68.9% of children spent at least 1 hour per week on this activity.
Half of children get to and from school (53.3% and 59.6%, respectively) on foot or by bicycle/scooter.
81.3% of children had the average duration of sleep of 9.5 hour, which complies with the recommendations of National Sleep Foundation (USA).
The study shows that 88.3% of children (weekdays) and 80.2% (weekends) spend at least an hour per day doing homework or reading books outside of school.
Preliminary round of survey revealed that 43% of children aged 6-9 spend at least 2 hours a day on screen time on average (among the 26 countries that provided data). In Ukraine, 55.2% of children spent at least 2 hours on screen time on weekdays, and 83.2% on weekends.
Conclusion: There is a high compliance level of physical activity among the surveyed children during weekdays and weekends. Balancing the out-of-school academic load and integrating more physical activities out of school might be considered as further recommendations to preserve positive findings and safeguard them for the next school years.

Conflict of Interest: None Disclosed.

Funding: Research was funded by the Swiss Agency for Development and Cooperation (SDC), within the framework of Ukrainian-Swiss Project "Reducing Risk Factors for Non-Communicable Diseases in Ukraine," led by GFA Consulting Group GmbH.

PO2.086

Social identity, values and beliefs: A protocol for discovery of best practice behavioural support provided during pharmacological treatment for obesity

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Introduction: Quieting the unwanted rumination over food, along with the wish to fill the void that materialises as the inability to feel satiated are desirable prospects for many persons living with obesity (PWO) who find difficulties overcoming the grasp overeating holds on them. The introduction of the new wave of anti-obesity medications (AOMs), Glucagon-like peptide-1 receptor agonists (GLP-1s), has given renewed hope to many PWO due to the potential ability of the medication to reduce food cravings and aid in prolonged satiation, leading to a low-calorie diet and an overall reduction in body weight by up to 20%. While these effects are promising and can lead to short term health benefits, weight regain often occurs after cessation, thus there is a need for behavioural support alongside treatment. Past GLP-1 trials have offered behavioural support components, however, details of the nuances of these approaches are largely elusive in the published literature. Furthermore, to date, little is known about the motivations, behaviours, and potential shifts in values and social identities for PWSO who are treated with GLP-1s. To provide an

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efficacious behavioural support program available to PWO treated with GLP-1s, it is necessary to illuminate these discrepancies in the literature.
Methods: A protocol to elucidate behavioural support utilised in GLP-1 trials, the efficacy of such support, and the experiences of PWO treated with GLP-1s has been developed. The research is recommended to take part in four separate studies. Study one is a systematic review of the behavioural components applied in GLP-1 trials, including an examination of the efficacy of the methods utilised. Study two is an ecological momentary assessment (EMA) utilising a cross-sectional design. Over a two-week period, participants living with obesity who, at the time of study, currently treated with GLP-1s, will be randomly prompted to describe dietary choices, levels and type of food cravings, physical activity engaged in, levels of motivation, resonance with social identities, support systems and emotional affect. Following the EMA, in study three, 10-15 participants who took part in the EMA will be invited to participate in semi-structured interviews where the discussion guide will focus on themes centred around identity, motivations, health values, and beliefs about health. Finally, study four will be a cross-national online survey aimed at PWO treated with GLP-1s for weight loss. The survey will gauge dietary preferences, physical activity, health values, food cravings, and rumination over food.
Impact: By conducting this research, it is expected that the knowledge of behavioural support, alongside the exposition of experiences of PWO treated with GLP-1s, will help to identify areas for opportunities of best practices for behavioural support to be provided in continuity with GLP-1 treatment for weight loss.

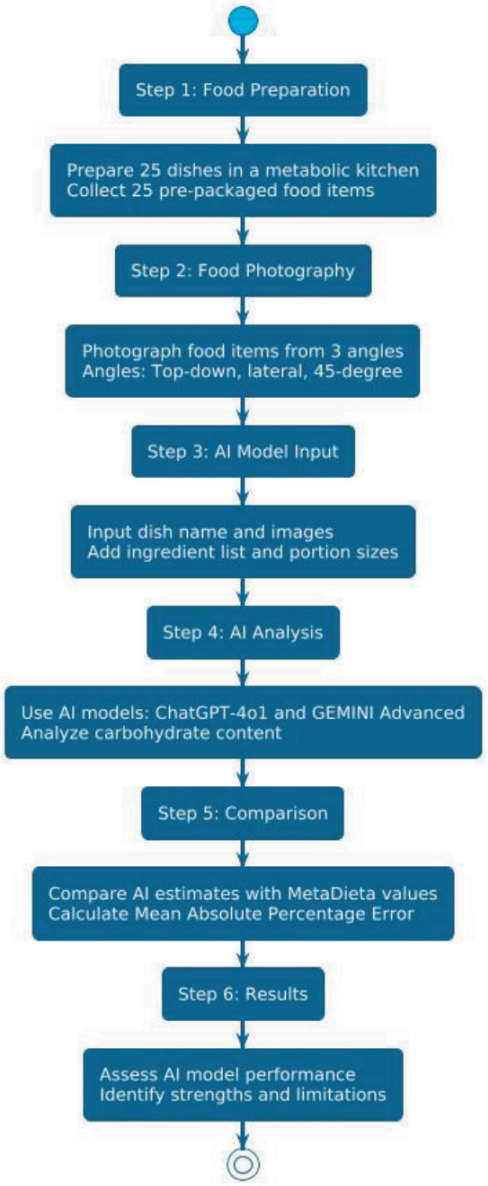
PO2.087

Advancing Carbohydrate Estimation in Type 1 Diabetes Management: A Comparative Study of Generative AI Tools for Enhanced Precision in Carb Counting

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Background: Accurate carbohydrate estimation is vital for managing type 1 diabetes (T1D), as it directly impacts prandial insulin dosing. Traditional carb counting methods are error-prone and fail to account for glycemic indices, portion sizes, and food combinations. Advanced generative AI tools, such as ChatGPT-4.0 and GEMINI Advanced, offer the potential to revolutionize nutrition management by providing more accurate and standardized carbohydrate estimations. Their application could have significant implications for improving dietary management in individuals living with obesity and T1D.
Objective: This study evaluated and compared the accuracy of ChatGPT-4.0 and GEMINI Advanced in estimating carbohydrate content under three real-world dietary scenarios: (1) dining in social settings, (2) dining out at restaurants, and (3) meal assessment at home. These scenarios reflect varying levels of information availability, aligning with common dietary challenges faced by individuals living with T1D and obesity.
Methods: Fifty food items were analyzed, comprising 25 dishes prepared in a metabolic kitchen and 25 pre-packaged foods. Each food was photographed from three angles and evaluated under three conditions: (1) image and dish name, (2) image, dish name, and ingredient list, and (3) image, dish name, ingredient list, and portion sizes. Carbohydrate estimates from the AI tools were compared to reference values obtained using MetaDieta software.
Results: GEMINI Advanced outperformed ChatGPT-4.0 across all scenarios. In the minimal-context condition (name + image), GEMINI achieved a mean absolute percentage error (MEAP) of -19.43% (SD: 37.70%), compared to ChatGPT's -30.13% (SD: 40.85%; $p < 0.05$). With added ingredient lists (name + image + ingredient list), ChatGPT improved significantly (MEAP: -8.86%, SD: 36.09%) compared to GEMINI (MEAP: -14.20%, SD: 37.70%; $p = 0.13$). In the fully detailed condition (name + image + ingredient list + portion sizes), GEMINI demonstrated superior accuracy (MEAP: -3.13%, SD: 8.62%) compared to ChatGPT (MEAP: -9.87%, SD: 11.92%; $p < 0.05$).
Conclusions: GEMINI Advanced consistently provided more accurate carbohydrate estimations, particularly in scenarios with limited or complete contextual information. ChatGPT-4.0 showed significant improvement with additional context, highlighting its adaptability. The integration of these AI tools into dietary management systems could offer significant benefits for patients living with T1D and obesity by enhancing nutritional precision, improving glycemic control, and supporting weight management strategies. These findings underscore the transformative potential of generative AI in nutrition and diabetes care, warranting further research in diverse populations and clinical settings.



This flowchart outlines the key steps in the process of estimating carbohydrate content in foods using generative AI models, ChatGPT-4o1 and GEMINI Advanced.

Fig. 1. Carbohydrate Estimation Using Generative AI Models.

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PO2.088

The independent association of rs9939609 variant in the FTO gene and general and abdominal obesity in menstrual and postmenopausal women

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Introduction: Obesity, especially abdominal obesity, a leading risk factor of many diseases, increases rapidly worldwide. It is attributed to both genetic and environmental factors, and in women the additional factor contributing to obesity is a menopause transition. The present study aimed to analyze the association between rs9939609 FTO A/T SNP, sociodemographic risk factors and general and abdominal obesity in menstrual and postmenopausal Polish women.
Methods: After excluding women with missing data (58) or pregnancy (25) we analyzed data of 1434 women from WOBASZ study (627 postmenopausal and 807 menstrual - randomly selected as a control group), median (IQR) aged 48 (36-57) years. A study protocol covered a face-to-face questionnaire, a physical examination and laboratory tests. All women had genetic assessment of rs9939609 FTO A/T SNP. The Hardy-Weinberg equilibrium using chi2 test was performed to ensure independent separation of allele. The ordinal logistic regression analysis was performed in menstrual and postmenopausal women to evaluate the chance of general obesity and abdominal obesity (by waist circumference - WC) in relation to rs9939609 FTO A/T SNP and other selected risk factors.
Results: Postmenopausal compared to menstrual women were of course older, worse educated, less often smoked cigarettes, less often were married or co-habited, and were characterized by significantly higher weight, BMI, and a higher prevalence of general obesity, abdominal obesity, diabetes, hypertension, but did not differ in terms of rs9939609 FTO genotype share. Genotype frequencies by menopausal status, BMI groups and WC groups were in Hardy-Weinberg proportions. The AA variant of obesity risk allele was found in 21.2% both menstrual and postmenopausal women and its frequency increased significantly with higher WC only in postmenopausal women (WC; ≤80cm: 13.1%, 80-88cm: 20.3%, ≥88cm: 23.1%). The overall frequency of the A allele was almost the same in menstrual and postmenopausal women (46.0% vs 46.5% respectively). rs9939609 FTO A/T SNP did not increase the chance of obesity in menstrual women. Only education less than tertiary, age and being married or co-habited increased the chance of both general obesity as well as abdominal obesity (WC≥88cm). However in postmenopausal women there was observed an association between rs9939609 FTO A/T SNP and obesity. Carriers of AA or AT genotype had higher chance of abdominal obesity (OR, 95%CI: AA – 1.77 (1.07-2.95); AT – 1.49 (1.00-2.22)) independently of diabetes (OR, 95%CI: 4.45 (2.15-9.22)), age≥55years (OR, 95%CI: 1.75 (1.17-2.61)) and education less than tertiary.
Conclusion: Obesity in women, both menstrual and postmenopausal, was associated with age, education level, marital status and smoking status. Additionally in postmenopausal women rs9939609 FTO A/T SNP was found to be associated with abdominal obesity independently of other risk factors including diabetes.

PO2.089

Use of semaglutide for weight reduction among healthcare system employees

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Background: Obesity represents a significant global public health issue, strongly associated with life-threatening comorbidities such as hypertension and type 2 diabetes. Recent advances in pharmacological treatments, particularly the use of semaglutide, offer promising results. However, self-medication practices among healthcare employees raise concerns about drug accessibility, motivation, and safety.
Objective: This study aimed to explore the phenomenon of semaglutide use for weight reduction among healthcare system employees, focusing on motivations, sources of procurement, experienced side effects, and perceived effectiveness.
Methods: A cross-sectional quantitative study was conducted using an online survey distributed to healthcare system employees, including medical and non-medical staff. Participants (n=163) were required to have used semaglutide for weight reduction. Demographic, anthropometric, and treatment-related data were collected, alongside opinions about semaglutide use.
Results: Respondents were predominantly female (80%), with a mean age of 35.6 years. Most participants worked in large urban hospitals. The average BMI was 27.8 kg/m^2. Respondents reported motivations such as health improvement (60%) and aesthetic goals (40%). Sources of semaglutide included prescriptions (70%), online purchases (20%), and other means (10%). Side effects were commonly reported, including gastrointestinal discomfort (30%) and fatigue (15%). Despite these challenges, 85% of participants perceived the treatment as effective, with 70% expressing a willingness to continue therapy.
Conclusion: The findings highlight significant trends in semaglutide use among healthcare professionals, emphasizing the need for regulated access, education on safe practices, and further research into long-term outcomes. These insights can guide public health policies and improve clinical recommendations for weight management.

PO2.090

Maternal vitamin B12 status and risk of SGA in women with a history of metabolic bariatric surgery

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Introduction: Metabolic bariatric surgery (MBS) is the most effective treatment for severe obesity and more than half of all procedures are performed in women of childbearing age. After MBS, there is an increased risk of small-for-gestational age (SGA) infants. Low maternal vitamin B12 has been suggested as a contributing factor to this increased risk, with a potential modifying role of folate status. The aim of this study was to investigate the association between maternal vitamin B12 status and risk of delivering an SGA infant in women with a history of MBS, while exploring the potential modifying role of folate status.
Methods: Multicenter observational cohort study including 125 pregnant women with a history of MBS (Roux-en-Y gastric bypass, 68%; sleeve gastrectomy, 32%). Linear mixed models and Cox proportional hazard

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regression models were used to analyze the association between delivering a SGA 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 SGA group compared to the non-SGA 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 an SGA infant compared to women with low vitamin B12 levels (T1: adjusted RR 0.23, 95% CI: 0.07-0.70; T2: adjusted RR 0.30, 95% CI: 0.10-0.92 for trimester 2). In the third trimester, among women with high folate levels, high vitamin B12 was associated with a reduced risk of SGA (adjusted 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 SGA (adjusted RR 2.44, 95% CI: 0.43-13.82).
Conclusion: This study indicates an inverse association between maternal vitamin B12 levels and risk of SGA infants in pregnant women with a history of MBS, 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 an SGA infant while incorporating the effect of supplementation, functional markers of vitamin B12 and alternative approaches for the definition of fetal growth restriction.

PO2.091

Study of How Adiposity in Pregnancy has an Effect on outcomeS (SHAPES): Characteristics of the cohort population

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Background: Current UK guidelines use BMI to identify pregnant women with high-risk pregnancies needing extra care. However, BMI may not accurately predict risk of pregnancy complications as it does not account for adipose tissue amount and distribution. The SHAPES prospective cohort (ISRCTN82185177) aimed to explore whether alternative measures of adiposity, such as waist circumference, are more accurate than BMI for pregnancy risk prediction. This interim analysis presents the preliminary SHAPES cohort profile.
Methods: A total of 1450 women aged ≥18 years were recruited during their first trimester scan appointment at Newcastle upon Tyne Hospitals NHS Trust, and 1444 had complete data. During their scan appointment, we collected socio-demographic data (e.g. age, parity, ethnicity, deprivation); clinical and behavioural data (e.g. smoking, blood pressure, alcohol, previous pregnancy/preconception history); early pregnancy adiposity data using ultrasound (pre-peritoneal and abdominal visceral and subcutaneous fat) and anthropometric measures (height, weight, waist, hip, arm, neck circumferences, skinfolds) following ISAK protocols. Pregnancy outcomes were linked from routine medical records; gestational diabetes (GDM) is the primary outcome for the SHAPES cohort. Descriptive statistics were used to analyse participant characteristics and adiposity measures to provide an overview of the SHAPES cohort profile.
Results: Participants had a mean age of 30 years (SD=5.19), with 51.3% nulliparous, 32.9% primiparous, and 15.8% multiparous. Most participants were white (82.5%), followed by Asian (10.2%), Black (3.4%), and mixed/other ethnic backgrounds (3.3%), consistent with the Newcastle maternity population. Over half (56.7%) lived in highest deprivation quintiles (1 and 2), and 11.2% had smoked in the past year, with 6.8% stopping by the data collection period. Alcohol consumption was low, with 98% reporting no alcohol or consumed below the recommended limit of 14 units/week. Mean BMI was 27.6kg/m² (SD=6.3), waist circumference (WC) 85.3cm (SD=12.6), neck circumference 33.2cm (SD=2.6), visceral fat 40.3mm (SD=14.8), waist-to-hip ratio (WHR) 0.80 (SD=0.06), and waist-to-height ratio (WHtR) 0.50 (SD=0.06). The prevalence of obesity (BMI ≥ 30.0kg/m) was 29.9%, 53.4% in the higher risk categories of WHtR ≥0.5 and 18.2% in the higher risk of WC ≥80cm and WHR >85, respectively. GDM was diagnosed in 236 women (16.4%).
Conclusions: This preliminary analysis provides an overview of the SHAPES cohort, which reflects the local background population. The level of obesity and deprivation are substantially higher than the national average for England and the proportion of white participants slightly higher, but other socio-demographics are comparable to England averages. The GDM prevalence aligns with rates expected in highly deprived UK regions. The final analysis, due in July 2025, will provide risk prediction data for each of the adiposity measures and pregnancy outcomes, comparing these with current us of BMI. Risk prediction models including adiposity measures, clinical and socio-demographic variables will also be developed and compared with BMI.

PO2.092

Socioeconomic inequalities in exposure to obesogenic neighbourhood characteristics at various life stages: Two OBCT systematic reviews

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Purpose: Inequalities in health behaviours and health outcomes may be partly driven by unequal exposure to food- and physical activity (PA) environments. Consequently, numerous studies have examined socioeconomic inequalities in exposures such as the neighbourhood availability of fast-food outlets, supermarkets, and sports facilities. To gain a better understanding, these results should be systematically summarised. This study aims to comprehensively review and, where possible, meta-analyse neighbourhood- and individual-level socioeconomic inequalities in exposure to obesogenic neighbourhood characteristics at various life stages.
Methods: We conducted systematic searches in the PubMed, Scopus, Web of Science, and Embase databases in February 2024. Eligible studies were quantitative, primary research that included objective measures of the food- and/or PA environment and at least one indicator of socioeconomic position (SEP), either at individual or area-level. Titles and abstracts were screened using the AI-based tool ASReview. Full-text screening was performed in duplicate, with disagreements resolved through discussion between reviewers. Data extraction followed a predefined form, and risk of bias was assessed using a shortened and adapted version of the AXIS tool. Results of studies with sufficient homogeneity were meta-analysed; others were synthesised qualitatively or through vote counting (relative disadvantaged exposure for lower SEP; advantage; or no difference).
Results: After deduplication, 21,063 studies were included in the reviews. After title/abstract screening, full-text screening was conducted on 283 studies on food environments and 546 studies on PA environments. Data were extracted from 163 studies on food environments and 286 on PA environments. Preliminary results of 607 associations show that 53.5% of the studies on food environments and 31.7% of the studies on PA environments indicated significantly disadvantageous exposure for lower SEP. Remaining studies showed either an advantage for lower SEP, null results, or mixed findings. Considerable variability in findings was observed based on SEP-indicators, environmental metrics used, country of study, and statistical methods applied.
Conclusion: These reviews provide insights into socioeconomic inequalities in food- and PA environments, underscoring the complexity of the relationship between SEP and exposure to obesogenic environments. They provide valuable entry points for public health and preventive efforts aimed at addressing the social determinants of health and reducing health inequalities.

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PO2.093

Obesogenic environments and cardiovascular disease incidence: A population-based cohort study of 4.4M adults

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Introduction: Obesogenic built environmental exposures have been associated with adverse cardiovascular outcomes, but research is largely cross-sectional and limited to single exposures. Moreover, previous studies have mostly examined one exposure at a time, but this approach is limited because individuals are constantly exposed to multiple environmental factors simultaneously. This study investigated the association between exposure to obesogenic environments, as measured by the Dutch Obesogenic Built-environmental Characteristics (OBCT) index, and 14-year CVD incidence in adults.
Methods: We conducted a longitudinal cohort study using national registry data accessed through Statistics Netherlands. We included 4,407,426 Dutch residents aged ≥40 years with no history of CVD at baseline (January 1, 2006). The OBCT index, ranging from 0 to 100, quantified the obesogenicity of participants' living environments at baseline in a 1000m circular buffer around the residential address. The index is a combination of the neighbourhood food- and physical activity environment, encompassing five constructs: food environment, sports facilities, bikeability, walkability, and driveability. We calculated Person-time from baseline until the first hospital admission due to any CVD, or out-of-hospital death due to any CVD, death due to other causes, or end-of-study date (December 31, 2019), whichever came first. CVD outcomes included overall CVD, coronary heart disease (CHD), stroke, and heart failure (HF), as identified through the hospital discharge registry and national cause-of-death registry. Cox proportional hazard models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs), adjusting for potential neighbourhood- and individual-level confounders. For each quintile of the OBCT index, we calculated the attributable fraction among the exposed (AF) using the formula AF = (HR-1)/HR. We also tested for effect modification using multiplicative interaction terms.
Results: Over 53,118,994 person-years of follow-up, 437,927 (9.9%) individuals were hospitalised for CVD. A 10-point higher OBCT index score was associated with a 1.1% (HR: 1.011; 95%CI: 1.009–1.013) higher risk of any CVD. Participants in the highest OBCT index quintile had a 4.9% (HR: 1.049; 95%CI: 1.038–1.060) higher risk of CVD compared to those in the lowest quintile, corresponding to 4,201 (4.7%) attributable CVD events. A 10-point higher OBCT index was also associated with CVD mortality (HR: 1.010; 95%CI: 1.006–1.014) and for specific outcomes: CHD (1.1% higher risk), stroke (0.9% higher risk), and HF (1.2% higher risk). Associations were stronger in the highest income group and among individuals exposed to high PM2.5 levels (≥15.2 $\mu g/m^3$).
Conclusion: Living in a more obesogenic environment is associated with a higher 14-year risk of CVD. These findings underscore the need of strategies targeting obesogenic environments to prevent CVD at the population level.

PO2.094

Mediated effects of LIFE4YOUth—a mobile health intervention for multiple lifestyle behavior change among high school students in Sweden: Findings from a randomized controlled trial

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Background: Health risk behaviors, in terms of physical inactivity, unhealthy dietary intakes, smoking, and excessive alcohol consumption are closely related to non-communicable diseases including type 2 diabetes, cancer, cardiovascular disease, and obesity. Since adolescence is a critical phase to establish long-term healthy behaviors that track into adulthood, actions that target improved health behaviors are specifically important in this age group. Digital interventions have been shown to improve adolescents' health behaviors. However, little is known about the mechanisms of change related to multiple risk behaviors in this population. This study aimed to estimate the natural direct and indirect effects of a digital intervention for multiple health behavior change in high school students.
Methods: This was a secondary analysis of mediated effects of a digital intervention based on data from a randomized controlled trial among high school students in Sweden. Participants were classified as being at risk with respect to having at least one health risk behavior among lack of physical activity, unhealthy diet, alcohol consumption, or smoking. The digital intervention comprised of weekly monitoring and feedback of health behaviors together with content on strategies for behavior change. The comparator was referral to a national website where health information was available. Primary outcomes were self-reported physical activity, diet, alcohol consumption, and smoking at 4 months post-randomization. Based on a counterfactual framework, three potential mediating factors were assessed: importance, knowledge of how to change (know-how), and confidence.
Results: Between September 2020 and June 2023, 756 high school students were recruited. The estimated indirect effect on weekly moderate-to-vigorous physical activity via the mediating factors was 5.2 minutes (95% CoI = -8.6; 19.9) while the estimated direct effect was 76.3 minutes (95% CoI = 19.4; 134.2). For fruit and vegetable consumption, the estimated indirect effect was 0.04 daily portions (95% CoI = -0.01; 0.1), and the estimated direct effect was 0.19 daily portions (95% CoI = -0.08; 0.45). No marked mediated effects were observed concerning alcohol- or sugary-drinks-intake, and smoking.
Conclusions: The observed intervention effects of increased physical activity and fruit and vegetable intake could only to a small extent be explained by increased confidence and know-how. Future studies should explore other potential mediators and evaluate different approaches for how to best assess psychosocial mediators in multiple lifestyle behavior interventions for adolescents. Moreover, it is likely that interventions promoting healthy lifestyle choices for adolescents would gain from including tailored strategies to achieve improved lifestyle behaviors.

Conflict of Interest: MB owns a company (Alexit AB) that develops and distributes lifestyle interventions for healthcare settings. Alexit AB had no part in funding or planning this trial. All other authors declare no competing interests.

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PO2.095

Moderators and mediators of the association between the obesogenicity of neighbourhoods and waist circumference in Dutch adults: an OBCT study

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Purpose: Obesogenic environments may contribute to an individual's weight status by influencing dietary behaviours and physical activity (PA). However, research examining the relationship and pathways between combined indicators of environmental obesogenicity, lifestyle behaviours and weight status remains limited and inconsistent. Furthermore, exposure to obesogenic environments may not be equally important to all population subgroups. Therefore, this study aimed to assess sociodemographic, personality, and psychological moderators, and lifestyle behavioural mediators of the association between obesogenicity of neighbourhoods and weight status in Dutch adults.
Methods: This cross-sectional study used baseline data from 150,506 adult participants of the Lifelines study. Lifelines is a multi-disciplinary, prospective, population-based cohort study that includes individuals living in the north of the Netherlands. To quantify obesogenicity of Dutch neighbourhoods, the Obesogenic Built Environment CharacterisTics (OBCT) index was used, calculated for 1,000m circular buffers around participant's residencies. Z-scores of components across food and PA environments were averaged, and rescaled from 0 to 100. Weight status was operationalised as objectively measured waist circumference. Stratified linear regression analyses by (self-reported) sociodemographic factors, perceived stress, impulsivity, self-discipline, and deliberation were conducted when interaction terms were significant (P<.01). Mediation by adherence to the Dutch PA guidelines and dietary behaviour was examined using the difference-in-coefficients approach.
Results: Every 10% increase in OBCT index was associated with a 0.65 (95%CI [0.59, 0.71]) centimetre larger waist circumference. The association was largest for respondents who were younger, had lower income, the highest educational level, the least self-discipline, the highest impulsivity scores and the most perceived stress. Adherence to PA guidelines and dietary behaviour mediated 13.3% of this association; however, the difference in coefficients was not statistically significant.
Conclusions: Obesogenic environments relate to waist circumference partly via lifestyle behaviours in our study, and some population subgroups are more susceptible to obesogenic exposures. This warrants general and tailored health protection of those who need it the most. These results could be used to better target lifestyle interventions, and to guide policymakers and urban planners in promoting health-enhancing environments.

PO2.096

A Close Relationship Between Ultra-Processed Foods and Adiposity in Adults in Southern Italy

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Introduction: One of the main culprits of the obesity epidemic is the obesogenic food environment, which promotes the consumption of ultra-processed foods (UPFs) that are highly palatable, have low nutritional quality as well as having a high caloric impact and being economical and ready to use. This monocentric retrospective study explored the association between UPFs, obesity and adiposity measurements among adults living with obesity in Southern Italy.
Methods: According to their Body Mass Index (BMI) values, 175 participants (63M) were recruited and stratified into three groups. To evaluate their usual eating habits, PREDIMED and the Nova Food Frequency Questionnaire (NFFQ) were administered to investigate Mediterranean diet (MD) adherence and UPF consumption. Anthropometric and biochemical measurements, body composition, as well as visceral obesity indices were collected.
Results: Data obtained showed an increase in UPF consumption as the BMI increased, with a concomitant decrease in MD adherence. Soft drinks were the most representative UPF in all groups, and we observed a significant increase in such consumption as the BMI increased. In addition, in the highest tertile of UPF consumption, there was an increase in adiposity indices.
Conclusions: Our data suggest that high UPF consumption correlates with an increased BMI and visceral adiposity, and it is a predictive risk factor for the occurrence of non-communicable diseases.

PO2.097

Association between health inequalities and maternal adiposity: a secondary analysis of data from the Study of How Adiposity in Pregnancy has an Effect on outcomeS (SHAPES)

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Background: Maternal obesity, defined using BMI ≥30kg/m², is associated with health inequalities including deprivation and ethnic disparities. While BMI is a widely used obesity measurement, it may not reflect obesity risks related to body fat type and distribution, which the SHAPES cohort is aiming to assess. However, there is a lack of research exploring maternal adiposity measures and inequalities. This secondary analysis explored associations between inequalities (socio-demographic and behavioural factors) and different maternal adiposity measures.
Methods: This secondary analysis used data from the SHAPES prospective cohort study. A total of 1450 women aged ≥18 years were recruited during their first trimester scan at Newcastle upon Tyne Hospitals NHS Trust, UK, with 1444 women included in this analysis. Linear regression was used to explore associations between inequalities (deprivation- using index of multiple deprivation (IMD), age, parity, ethnicity, smoking status, and alcohol consumption) and maternal adiposity measures (waist circumference (WC), waist-to-hip ratio (WHR), waist-to-height ratio (WHtR), neck circumference (NC), visceral fat, and total adipose thickness). Multivariable linear regression analysis adjusted for age, parity, ethnicity, smoking, and alcohol consumption.
Results: Women in the most deprived quintiles (1-2) had higher adiposity measures, including WC (β 3.599 cm, 95% CI 1.541, 5.657), WHR (β 0.010, 95% CI 0.000, 0.020), WHtR (β 0.030, 95% CI 0.017, 0.043), and visceral fat (β 4.563 mm, 95% CI 2.144, 6.982), compared with the least deprived (quintile 5). Parity had a strong and positive association, with multiparous women showing higher visceral fat (β 5.562 mm, 95% CI 3.246, 7.879) than nulliparous women. Ethnic differences were observed, with Asian women showing lower NC (β c-0.827 cm, 95% CI -1.293, -0.360), while Black women had higher visceral fat (β 4.874 mm, 95% CI 0.929, 8.820) than white women. Smoking was associated with higher visceral fat (β 3.288 mm, 95% CI 0.792, 5.785). Minimal associations were observed for age and alcohol consumption.
Conclusion: This analysis identified significant associations between socio-demographic and behavioral inequalities and various maternal adiposity measures. Higher adiposity was observed in women from the most deprived quintiles, multiparous women, certain ethnic groups, and those smoked. These findings emphasize the need to address social determinants of health to reduce obesity-related risks and highlight the importance of considering alternative adiposity measures beyond BMI to capture the complex risks associated with body fat distribution. However, there is a knowledge gap regarding how these alternative measures relate

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to health inequalities and whether they can more effectively predict risks in disadvantaged populations. Future research and tailored interventions targeting these specific measures may lead to better health outcomes for mothers and their children.

PO2.098

Exploring the link between alexithymia and eating behaviors: emotional, external, and restrictive patterns

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Introduction: Obesity and eating disorders are a global concern due to their increase in recent years. Alves et al. (2024) noted that people living with obesity engage in overeating, which is often linked to an emotional aspect. Probably, patients with eating disorders who use to binge eating and do compensatory behaviors have difficulty linking these behaviors to their emotional triggers. Alexithymia refers to a personality trait marked by a difficulty in expressing and recognizing emotions in the self, therefore people who suffer it will have emotion-processing problems, the most well-known symptoms are the following: difficulty distinguishing between emotions and physical sensations and problems in describing emotions to others (Silvertant, 2023). The prevalence of alexithymia is less than 10% at general population (Fernández, 2011). There is not much recent research on the relationship between alexithymia and obesity, but some researchers conclude that alexithymia significantly influences body dissatisfaction and might serve as a contributing factor to the emergence of eating disorders (Díaz & Aizpuru, 2016). Moreover, Brewer et al. (2015) have explained that alexithymia is present in eating disorders like obesity and is responsible of the deficits in emotion recognition.
Considering the previously stated, the purpose of this study is to explore the relationship between different eating patterns and alexithymia.
Methods: In total, 150 participants voluntarily completed an online questionnaire, which included the Dutch Eating Behaviours Questionnaire (DEBQ) and the Toronto Alexithymia Scale (TAS-20). The first test evaluates different types of eating behaviours: emotional eating, external eating, and restrictive eating. The second test measure some alexithymia traits, it evaluates difficulty identifying feelings, difficulty describing feelings and externally-oriented thinking. A series of Pearson's Correlations tests were performed to study the possible correlation between alexithymia and the different subscales of the DEBQ.
Results: Results indicated a significant positive correlation between TAS-20 scores (total score) and emotional eating ($r = 0.316$, $p < 0.01$), as well as TAS-20 scores and external eating ($r = 0.277$, $p < 0.01$) and TAS-20 scores and restrictive eating ($r = 0.184$, $p < 0.05$). These results suggest a one-tailed positive correlation, where higher TAS-20 scores (total score) are associated with higher scores in emotional, external and restrictive eating. However, no significant correlation was found between externally-oriented thinking and external eating ($r = 0.090$, $p > 0.05$), neither between externally-oriented thinking and restrictive eating ($r = 0.083$, $p > 0.05$).
Conclusion: In summary, people with alexithymic traits are more likely to experience emotional, external and restrictive eating. Nevertheless, it would be beneficial for future studies to focus on recruiting participants with a diagnosis, the main reason for this is to achieve improvements in treatments.

Conflict of Interest: None Disclosed.

Funding: No funding to report.

PO2.099

Healthy weight and cancer prevention – a policy blueprint

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Background and Objectives: There is well established evidence that body weight influences cancer risk. The WCRF/AICR Cancer Prevention Recommendations summarise the evidence around weight, nutrition and physical activity 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 and impact living well with and beyond cancer. To encourage the adoption of these recommendations by all and lower cancer risk, governments need to implement population-level policies that create environments that promote healthy behaviours with regards to diet, weight, and physical activity.
Methods: We mapped the WCRF/AICR Cancer Prevention Recommendations, which summarise the best available evidence on cancer risk, against policy advice for population-level cancer prevention. For each recommendation, we integrated relevant 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 and the Global action plan on physical activity, among others.
Results: The resulting Policy Blueprint for Cancer Prevention presents a package of policy recommendations across 8 key policy areas that apply across diet, weight, 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 to promote healthy diets and weight and increase physical activity, thus preventing cancer and supporting healthier environments for people living with and beyond cancer.

PO2.100

Bodyweight Perception, Motivations for Losing Weight, and Sources of Information on Bodyweight Reduction Among People in Czechia

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Introduction: Obesity is a chronic disease that leads to various obesity related comorbidities and results in a decreased quality of life. Data from national research indicate a high prevalence of overweight and obesity in the Czech population. However, information on bodyweight perception, motivations for losing weight, and the sources that people use to find the information about weight loss are lacking.
Methods: This quantitative research, conducted between April 12 and 15, 2024, in Czechia, surveyed respondents from the general population about their perception of body weight, motivations for weight reduction,

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and sources of information how to lose weight. The study was carried out using a Computer-Assisted Web Interviewing (CAWI) method and utilized a representative sample of the Czech online population (N=1100).
Results: Out of 1,100 respondents, 49% were men and 51% women, with 50% being 45 years of age or younger. Based on their responses, the BMI categories of the respondents were as follows: 31% had a BMI below 25 kg/m², 30% had a BMI between 25 and 29.9 kg/m², 21% had a BMI equal to or higher than 30 kg/m², BMI was not provided in 18%. In total, 64% of respondents stated that they wanted to lose weight, and 53% (580 respondents) had attempted to lose weight in the past three years. Of those, 92% reported trying more than once, but only 11% sought to lose weight in cooperation with a physician during their most recent attempt. Among the 580 respondents who tried to lose weight in the past three years, the primary motivations for losing weight were avoiding health complications (58%), feeling better about themselves (49%), and improving overall health (49%). Additionally, 55% of respondents expressed a desire to maintain their new weight long-term. The main sources of information how to achieve weight loss during their most recent attempt were the internet (60%), followed by social media (25%) and weight loss applications (21%).
Conclusion: In this CAWI research conducted with 1,100 respondents in Czechia, 64% expressed a desire to lose weight. The majority of those who attempted weight loss had tried more than once, with the primary motivation being the avoidance of health complications. The internet was identified as the main source of information about the means of weight loss.

PO2.101

The Relationship Between Emotional Eating and BMI: Insights from the Emotional Eating Scale

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Introduction: Emotional eating refers to the tendency to eat in response to negative emotions such as anxiety or irritability (Van Strien et al., 2007). Beyond its nutritional role, eating plays a key part in emotional regulation. With over 40% of the global adult population affected by overweight or obesity (WHO, 2022), evidence increasingly points to emotional eating as a significant contributing factor to these conditions.
Methodology: This study utilized the Emotional Eating Scale (Rojas & García-Méndez, 2016), which evaluates five factors:
Emotion: The role of food in regulating stress, sadness, or anger.
Family: Food as an expression of affection and family bonding.
Indifference: Apathy towards nutritional quality and eating habits.
Culture: Eating behaviours shaped by social norms and group events.
Food effect: Mood changes associated with eating.
The scale was administered through an online survey using simple random sampling and snowball sampling methods. Data on demographic characteristics, height, and weight were collected to calculate BMI. A total of 184 participants (57 men and 127 women) completed the survey, with average BMIs of 26 for men and 25 for women.
Results: A significant correlation was observed between BMI and the overall score on the Emotional Eating Scale. Notably, the Emotion and Indifference factors were strongly associated with BMI. Participants who reported using food to manage negative emotions or who exhibited low concern for nutritional quality tended to have higher BMI levels.
Conclusion: These findings support previous evidence linking emotional eating to overweight and obesity. The strong association between BMI and the Emotion and Indifference factors highlights the importance of addressing emotional regulation and mindful eating in interventions. Future research should explore these dynamics further to inform comprehensive strategies for managing obesity and promoting healthier eating behaviours.

PO2.102

Digital Coaching in the Workplace: Examining the Impact on Weight Management and Mental Health

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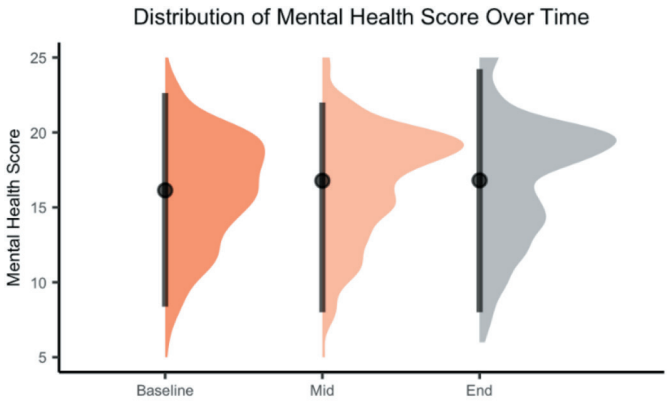
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Introduction: This study examines the impact of a digital intervention on weight management and mental health in a workplace setting. Given that individuals spend significant time at work, many of their health behaviours are influenced by the workplace environment, making it an ideal context for health interventions. We aim to explore the potential synergies and health outcomes that arise from integrating mental health considerations into workplace weight management initiatives. By evaluating a digitally delivered 6-months coaching programme, the research seeks insights into weight loss and mental health outcomes, as well as their interconnectedness in the context of everyday work life.
Methods: This study was conducted from September 1 to December 15, 2022, in various workplace settings across Denmark. A total of 880 participants were engaged, including employees and their spouses covering industries such as manual labor, office work, transportation, and municipal services. Participants were onboarded the digital coaching app Liva which they used to support behaviour change throughout the 6-month intervention. Data collection included ongoing self-reported weight measurements and surveys at baseline, mid-point, and end-point to assess mental health scores, which ranged from 0 (poor mental health) to 25 (optimal mental health).
Results: The baseline demographics revealed a mean age of 48 years, mean initial weight of 92 kg, and mean BMI of 31.5 kg/m², with 78% identifying as female. Among those with valid weight registrations, significant reductions were observed, resulting in a mean weight loss of 5.95 kg ($t=-7.76$, $p<0.001$) by the programme's conclusion. Similarly, for participants completing the mental health survey, the mental health scores showed a progressive improvement, with the most notable increase in the average score of 0.36 points ($t=1.24$, $p=0.11$) occurring between the baseline and mid-point assessments, thus in the first phase of the intervention. However, these changes were not statistically significant. Regression analyses indicated no significant correlation between weight loss and changes in mental health scores.
Conclusion: Our findings demonstrate that a digital health coaching programme in the workplace can lead to significant and clinically relevant weight loss, enhancing daily weight management. While mental health improvements were also observed, they were not statistically significant. The trend in change of the mental health score suggests that the initial phase of the intervention is crucial for enhancing mental well-being, highlighting the need for effective engagement of participants during this stage. Although no correlation was found between weight and mental health changes, the limited cohort size of suggests that larger samples may yield different results. Further research is needed to validate these findings and explore the complex relationship between mental health and weight management in workplace settings.

Conflict of Interest: None disclosed

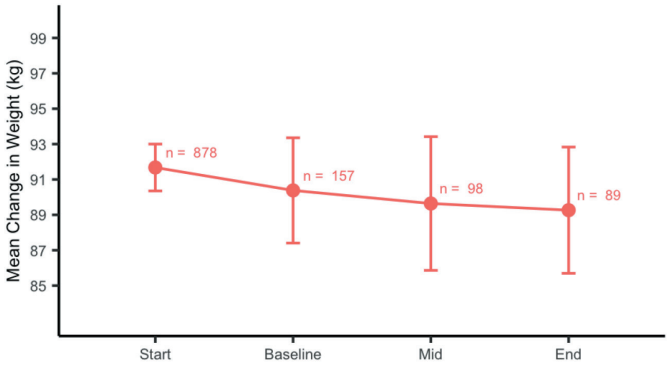
Funding: No funding to report

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The figure displays how the mental health score is distributed at baseline, mid-point (3 months) and at end-point (6 months) by participants following the digital health coaching programme.

Fig. 1. Distribution of Mental Health Score Over Time.



The figure displays how the average weight is changing over time by participants following the 6-month digital health coaching programme.

Fig. 2. Mean Change in Weight Over Time.

PO2.103

Body Dissatisfaction and Its Role in Maladaptive Eating Behaviors: Insights for Obesity Prevention and Treatment

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Introduction: Body dissatisfaction refers to a negative self-perception regarding one's weight, shape, or size. It has been widely recognized as a significant psychological factor contributing to both obesity and eating disorders (Rodgers et al., 2018). Emerging research highlights that body dissatisfaction can predict maladaptive eating behaviors, including dietary restriction, binge eating, and the adoption of extreme weight-control practices (Stice & Shaw, 2002). These behaviors not only undermine adherence to healthy lifestyle habits but also contribute to long-term weight gain and poor mental health outcomes (Neumark-Sztainer et al., 2006).
Methodology: The present study aimed to explore the relationships between body dissatisfaction, eating behaviors, and mental health among 141 adult participants. Body dissatisfaction was assessed using the Stunkard Figure Rating Scale a validated tool for identifying individuals with negative body image perceptions. Participants also completed the General Health Questionnaire (GHQ-28) to evaluate psychological well-being the Dutch Eating Behavior Questionnaire (DEBQ) to assess eating behavior dimensions, and the Yale Food Addiction Scale (YFAS) to measure the presence of food addiction symptoms.
Results: Our findings revealed that participants with body dissatisfaction scored significantly higher on the DEBQ's dietary restraint subscale. This suggests a strong inclination toward restrictive dieting, a behavior that paradoxically predisposes individuals to episodes of binge eating. Notably, food addiction (FA)—characterized by compulsive consumption patterns and shared features with binge eating disorder—was also more prevalent among individuals with body dissatisfaction. Moreover, analysis of the GHQ-28 indicated that these participants experienced heightened levels of social dysfunction, a pattern consistent with the social withdrawal commonly observed in individuals who engage in secretive binge episodes.
Conclusions: The study's results underscore the profound impact of body dissatisfaction on eating behaviors and psychological well-being. They further emphasize the cyclical nature of restrictive dieting and binge eating, wherein attempts to control weight through unhealthy means exacerbate feelings of failure and perpetuate maladaptive eating patterns. Addressing body dissatisfaction as a central component of obesity prevention and treatment strategies is essential for breaking this cycle.
Interventions targeting body image could help reduce the risk of maladaptive eating behaviors by promoting healthier attitudes toward weight and body shape. These interventions should include psychoeducation on the harms of restrictive dieting, strategies to develop a positive body image, and coping mechanisms for managing emotional distress. Integrating these components into multidisciplinary obesity programs may foster long-term adherence to healthy behaviors and improve both physical and psychological outcomes.

PO2.104

Waist circumference vs. body mass index as risk factors for obesity-related cancer risk: insights from the Swedish ODDS study

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Background: General adiposity, measured via body mass index (BMI), is a well-established risk factor for various cancers. Waist circumference (WC), a measure of abdominal adiposity, may better reflect the risks associated with abdominal fat. This study aimed to compare WC and BMI

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in their associations with the risk of obesity-related cancers and assess whether WC provides additional risk information beyond BMI.
Methods: Data from 339,190 individuals (mean age 51.4 years; 42% male) pooled from Swedish cohorts in the Obesity and Disease Development Sweden (ODDS) study were analyzed. Cancer diagnoses were identified via the Swedish Cancer Register. Cox regression models estimated hazard ratios (HRs) for WC and BMI, adjusted for age, smoking, sociodemographic factors, and other covariates. Regression dilution ratios accounted for measurement error. To assess WC's additional contribution beyond BMI, we analyzed WC residuals in multivariable, BMI-adjusted models. Sex-specific analyses were performed to identify differences in associations.
Results: During a median follow-up of 13.9 years, 25,078 incident cases of obesity-related cancers were identified, including 18,185 established obesity-related cancers based on IARC criteria. In men, a 1-standard deviation (SD) increase in WC was associated with a 25% higher risk of established obesity-related cancers (HR1-SD=1.25, 95% CI=1.21-1.30), stronger than BMI (HR1-SD=1.19, 95% CI=1.15-1.23, p(heterogeneity)=0.014). In women, WC and BMI showed similar associations with established obesity-related cancers (HR for WC=1.13, 95% CI=1.11-1.16; HR for BMI=1.13, 95% CI=1.11–1.15, p(heterogeneity)=0.357). WC residuals were more strongly associated with established obesity-related cancer risk in men (HR1-SD=1.09, 95% CI=1.06-1.12) compared to women (HR1-SD=1.03, 95% CI=1.02-1.05). These findings remained consistent when including potential obesity-related cancers, with similar patterns of association. Excluding female reproductive cancers to ensure comparability of cancer sites between men and women did not substantially alter the results.
Conclusions: WC appears to be a stronger risk factor of obesity-related cancer risk in men than BMI and provides additional independent risk information. In women, WC and BMI have comparable associations with cancer risk. The limited additional contribution of WC beyond BMI in women may be attributed to sex-specific differences in fat distribution or variations in how WC and BMI capture body fat in men versus women.

PO2.105

Patients' experience and perspective on dietary treatment of overweight or obesity - Polish pilot survey

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Introduction: Understanding patients' experiences, preferences, and factors affecting adherence to dietary therapy (DT) for overweight and obesity is a core for improving diet compliance and efficacy. Relativelly little is known about patients' perspective on DT among Polish with overweight or obesity. Therefore, the study aimed to evaluate patients' experiences and perspective of DT among Polish patients with overweight or obesity.
Methods: 172 adult Polish patients with excessive body weight participated in this pilot online survey study from December 2023 to July 2024. Due to the lack of meeting the inclusion criteria (n-43), the responses from 129 individuals were included in the analysis. The study was conducted using the CAWI method. The research toll was a self-designed questionnaire that focused on health and demographic data (section 1), and subjective assessment of experiences, course, difficulties, and effects of past or current DT (section 2). The questionnaire was distributed by social media platforms.
Results: 110 females (85.3%) and 19 males with mean BMI 31.55±6.01 (n-66 with obesity and n-63 with overweight) were included in the study. Most of them were aged 35-50 years old (67.5%), had a higher level of education (65.9%), and lived in the city (77.5%). Only 67 patients received a diagnosis of overweight or obesity from their doctor (or dietitian), but non-pharmacological treatment was recommended to 79,1% of them. 98,5% of respondents declared the need for "weight loss," and 94.6% tried to reduce their body mass. Among them, 14.2% do not and have never followed a diet. In the group of respondents who have experiences with DT, 80.6% (n-104) respondents (Group 1) declared that they were under DT in the past (n-56 combined with physical activity (PA), n-34 combined with PA and pharmacotherapy, n-9 with pharmacotherapy and n-6 as a diet alone). Interestingly, the decision to discontinue DT was made by 41.4% of patients, mainly because of financial reasons (28%) and no compliance to diet (24%). Only 61 (41.3%) individuals are currently on DT (Group 2). Only in 50% of patients in Group 1 and 21.3% in Group 2, the DT is/or was supervised by experienced dieticians. Overall, 48.6% of respondents considered follow-up visits to the dietitian to be very important for the effectiveness of DT, but only 43.8% in Group 1 and 29.5% in Group 2 make them regularly. For 24% of people in Group 1 and 13.1% in Group 2, a follow-up visit to a dietitian has negative connotations (e.g., being judged, criticized, lack of support, financial burden). The most difficult aspects of DT for respondents in Group 1 were preparing meals (26%), eating meals at recommended times (21.2%), and giving up snacking (17.3%). Similarly, the same aspects were indicated in Group 2 (16.4%, 18%, and 18%, respectively).
Conclusion: Long-term adherence to DT among patients with overweight or obesity is low, mainly because of the high cost of DT or loss of motivation. A future, in-depth assessment of patients' preferences, expectations, and factors influencing diet compliance, is necessary to create individualized, precise DT for people with overweight and obesity.

PO2.106

Health and lifestyle characteristics and the practice of low-carbohydrate and low-fat diets among participants in the Longitudinal Study of Adult Health (ELSA-Brasil)

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Introduction: The search for restrictive diets is motivated by multiple reasons. Over the years, low-carb (LCD) and low-fat diets (LFD) have gained popularity for their ability to deliver short-term results, such as weight loss and improvements in biochemical parameters, including glucose and LDL cholesterol levels. However, these diets remain controversial regarding their long-term effectiveness and whether their benefits outweigh the potential risks to the health of those who follow them. Therefore, the aim of this study is to compare the anthropometric, biochemical, dietary, lifestyle, and health characteristics of individuals who follow low-carb and low-fat diets and who don't follow them.
Methods: Data used were collected in the third wave (2017–2019) of the Elsa-Brazil cohort. Diets were classified as LCD or LFD based on the Brazilian Diabetes Society (<45%) and WHO (<30%) guidelines, respectively. Individuals who did not follow low-carb or low-fat diets were termed "usual". The student's t-test was used for the analysis, the significance level for all tests was $p < 0.05$, and statistical analyses were performed using Stata 16.0. A total of 11,294 participants were evaluated (45.3% men; 54.7% women) with a mean age of 52 ± 0.08 years.
Results: 15.7% of women and 19.2% of men follow an LCD, while 36.8% of women and 38.0% of men have adopted an LFD. In female participants, LCD resulted in a lower mean weight, reduced body mass index (BMI), higher caloric intake, increased HDL and total cholesterol levels, and a significant reduction in diastolic blood pressure (DBP) compared to the usual diet. Among men, LCD led to significant less weight, BMI, and

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Tab. 1. Low Carb and Low Fat Diets According to Anthropometric, Biochemical, Dietary, Lifestyle and Health Parameters.

Variables	Femaele			Male			
	Low carb	Usual	p-value	Low carb	Usual	p-value	Low fat
Weight (kg)	70,4 ± 13,0	68,8 ± 13,6	**<0,001***	84 ± 13,5	80,5 ± 14,4	**<0,001***	69,5 ± 13,6
BMI (kg/m²)	27,4 ± 4,8	27,0 ± 5,1	**0,032***	27,8 ± 3,9	27,0 ± 4,3	**<0,001***	27,1 ± 5,1
Calories (kcal)	2314 ± 561,5	2321 ± 558,7	0,704	2895 ± 750,5	2896 ± 728,8	0,976	2351,9 ± 558,4
HDL (mg/dL)	63,9 ± 14,9	61,3 ± 14,4	**<0,001***	52,3 ± 13,3	50,2 ± 11,6	**<0,001***	62,4 ± 14,8
TG (mg/dL)	111,7 ± 56,1	122,1 ± 88,7	**<0,001***	159,9 ± 107,47	162 ± 124,1	0,627	113,8 ± 97,4
LDL (mg/dL)	131 ± 32,8	131,4 ± 34,3	0,715	133,5 ± 35,7	130,5 ± 35,9	**0,001***	129,8 ± 32,7
Total cholesterol (mg/dL)	217,2 ± 38,7	216,9 ± 41,4	0,83	216,4 ± 42,0	211,8 ± 43,7	**0,002***	214,6± 40,1
Glucose (mg/dL)	106,1 ± 22,3	108,1 ± 27,2	**0,028***	116 ± 28,8	116,9 ± 35,3	0,454	106,1 ± 23,4
Glycated hemoglobin (%)	5,3 ± 0,8	5,4 ± 0,9	**<0,001***	5,5 ± 0,9	5,5 ± 1,1	0,521	5,4 ± 0,8
Fibers (g)	23,9 ± 8,8	32,9 ± 12,1	**<0,001***	28,3 ± 10,6	39,3 ± 15,1	**<0,001***	27,2 ± 10,1
MUFAS (g)	29,7 ± 8,8	22,2 ± 7,2	**<0,001***	36,8 ± 11,3	27,6 ± 9,1	**<0,001***	28,9 ± 7,8
PUFAS (g)	19,2 ± 6,5	16,7 ± 5,3	**<0,001***	24,3 ± 8,0	22,3 ± 7,1	**<0,001***	18,8 ± 6,1
Alcohol (dose/week)	5,9 ± 9,5	2,7 ± 5,2	**<0,001***	15,9 ± 16,4	8,2 ± 11,5	**<0,001***	3,3 ± 5,6
Cigarettes/day	13,7 ± 12,4	12,4 ± 11,1	**0,025***	17,4 ± 13,6	16,9 ± 13,4	0,438	13,3 ± 11,9
MET (min/week)	573,9 ± 948,4	531,5 ± 963,7	0,206	901,4 ± 1270,3	725,5 ± 1086,5	**<0,001***	520,9 ± 914,5
SBP (mmHg)	114,5 ± 15,4	117,6 ± 16,7	**<0,001***	124,1 ± 15,7	125,4 ± 16,4	**0,024***	115,2 ± 16,1
DBP (mmHg)	73,1 ± 9,6	73,9 ± 10,1	**0,022***	78,4 ± 10,4	78,8 ± 10,7	0,278	73,3 ± 10,0

Data expressed as mean ± standard deviation, BMI=Body mass index; HDL=High Density Lipoprotein; TG=Triglycerides; LDL= Low
PUFAS= polyunsaturated fatty acids; MET=Metabolic Equivalent Intensity Level; SBP=Systolic Blood Pressure; DBP=Diastolic Bloo

triglycerides (TG), alongside higher caloric intake and increased HDL levels compared to the usual diet. For the LFD, women experienced significant reductions in weight, TG, alcohol consumption, and DBP, coupled with higher caloric intake, increased fiber consumption, and elevated HDL levels compared to the usual diet. In men, the LFD was associated with lower weight, BMI, TG, alcohol consumption, and DBP, along with higher caloric intake, elevated HDL levels, and increased fiber consumption compared to the usual diet.

Conclusion: Although the test cannot affirm causality, both diets presented lower averages in indicators that can function as nutritional strategies to improve cardiometabolic profiles in the short term, depending on individual needs and health priorities.

Conflict of Interest: None Disclosed.

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PO2.107

Performance, cognitive function and tau protein levels in elderly patients with obesity and age-matched controls

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Background: Obesity in the elderly is associated to impaired performance, increased risk of disability and chronic low-grade inflammation. Moreover, some studies suggest that obesity in the elderly could be associated to an increased risk of cognitive decline and Neuro-Degenerative Disease, including dementia. Major aim of our study was therefore to investigate the association between obesity and NDD in the specific population of elderly people.

Methods: Elderly (age > 65 years) patients with obesity (PwO) and age-matched healthy elderly individuals (controls) were enrolled in a monocentric cross-sectional controlled study at the University Hospital of Padova (Italy). In this preliminary analysis, 14 PwO and 26 age-matched were enrolled. Cognitive (MMSE, MoCA, GDS, CRI-q) and physical performance tests (handgrip, SPPB) and blood sample were provided. In this analysis, the levels of Tau protein were used as a bio-marker for increased risk of NDD.

Results: Age was similar in PwO (72.2±5.2 years) and in controls (71.2±4.4 years). BMI was significantly higher in PwO (34.6±2.8 kg/m2) than in controls (25.1±3.4 kg/m2) (p<0.001). Functional capacity was significantly impaired in PwO, both for muscular strength (handgrip: 26.4±8.9 in PwO vs 32.2±10.4 kg in controls; p<0.08) and physical performance (SPPB: 7.3±2.0 in PwO vs 9.3 points in controls; p<0.01). No significant differences were observed in the results of cognitive tests (MMSE and MoCA). However, the levels of Tau-protein were significantly higher in PwO (4.2±1.6 ng/l) than in controls (3.0±0.9 ng/l) (p<0.05).

Conclusion: Our preliminary data confirm that obesity was associated to functional impairment in the elderly. The finding of higher levels of Tau-protein in PwO with still normal cognitive functions may suggest an increased risk of NDD in obesity.

PO2.108

Development of a high-resolution walkability index for Europe

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Introduction: Physical inactivity is a major risk factor for obesity and other non-communicable diseases, yet efforts to increase population-wide physical activity levels have achieved limited success. The built environment significantly influences physical activity behaviours. Walkability indices, which integrate multiple environmental features, offer a robust framework for assessing and promoting walkable environments. However, a standardised, high-resolution walkability index for Europe is currently

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lacking. This study aims to address this gap by developing a high-resolution, standardised walkability index for the whole of Europe.
Methods: We employed a comprehensive spatial approach to compute walkability indices for all European urban and rural areas. The index incorporates seven key components: walkable street length, intersection density, green space, slope, public transport density, land-use-mix, and population density. These components were calculated for 100m x 100m grid cells using harmonised datasets, advanced Geographic Information System (GIS) techniques, and innovations such as street network buffers and decay kernels to better reflect real-world density and proximity effects. Data were derived from high-resolution sources including Sentinel-2 imagery, NASA's Digital Elevation Model, OpenStreetMap, and the Copernicus CORINE land cover dataset. The walkability index was analysed using descriptive statistics, visual maps, correlation analysis, and spatial clustering to explore its distribution and underlying patterns across Europe.
Results: Preliminary results revealed significant disparities in walkability both within and between countries, regions and cities. High walkability scores were observed mostly in compact urban centres with dense street networks and diverse land uses. Suburban and peripheral areas tended to exhibit lower walkability, primarily due to reduced intersection density and lack of amenities.
Conclusion: This study demonstrates the value of integrating advanced spatial techniques into walkability research. The high-resolution, standardised walkability index provides an accessible resource for researchers, policymakers, and urban planners, fostering active living and improved public health across diverse European contexts.

PO2.109

The association between glucose dynamics and energy intake in young, healthy women

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Introduction: Regulating food intake is a key strategy in addressing obesity. Glucose has been implicated in the control of appetite and food intake. However, the relationship between circulating glucose concentrations and subsequent energy intake remains uncertain. The present study investigated whether glycaemic patterns are related to subsequent energy intake and whether the appetite-related hormones acylated ghrelin and oxyntomodulin mediate this relationship.
Methods: Thirty healthy young women (age: 25 ± 4 years; BMI: 21.4 ± 2.0 kg/m² (mean ± SD)) consumed a standardized breakfast after an overnight fast and remained in the laboratory for 240 minutes. Glucose was monitored with continuous glucose monitors (CGM, Abbott FreeStyle Libre 2TM, Witney, UK) every 5 minutes and via venous plasma in the fasted state and every 15 minutes after breakfast until 240 minutes. Energy intake was assessed at an ad libitum lunch at 240 minutes. Subjective appetite ratings were collected before and every 15 minutes after breakfast until 240 minutes. Concentrations of acylated ghrelin and oxyntomodulin were measured fasted and every 30 minutes from venous plasma. The relationships between glucose dynamics and overall satiety or energy intake were explored using generalised linear models with a gamma distribution and a log-link function. The mediating effects of appetite-related hormones on these relationships were assessed using the Sobel test.
Results: CGM-derived glucose nadir (lowest concentration) and dip (deviation of nadir from baseline as a percentage) were associated with overall satiety and energy intake ($p \leq 0.026$). Each 1 mmol/L increase in the glucose nadir was associated with a 22% (95% CI: 9% to 35%) higher overall satiety and a 19% (95% CI: 27% to 9%) lower energy intake. Each 1% increase in the glucose dip corresponded to a 0.4% lower overall satiety (95% CI: 0.8% to 0.01%) and a 0.8 % higher energy intake (95% CI: 0.4% to 1.2%). No associations were observed using venous plasma glucose ($p \geq 0.068$). Acylated ghrelin and oxyntomodulin did not mediate these relationships according to the Sobel tests ($z \geq -1.60$, $p \geq 0.110$).
Conclusions: When assessed via CGM, glucose dynamics, including the nadir and dip surrounding an individual meal, may influence satiety perceptions and subsequent energy intake. These data lend further support for a role of glucose in models of appetite regulation.

PO2.110

Folic acid supplementation in European women of reproductive age and during pregnancy with excessive weight: a systematic review

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Introduction: Neural tube defects (NTDs), well-known consequences of folate deficiency, are the second most common cause of serious birth defects, affecting approximately one in a thousand pregnancies in Europe. Maternal folate deficiency before conception and during early pregnancy has been suggested as the most important preventable risk factor for NTDs; thus, women should be supplemented before conception with 0.4 mg of folic acid (FA) until the first trimester of gestation.
Findings have described a positive association between elevated Body Mass Index (BMI) and birth defect risk; data on plasma folate levels in pregnant women with obesity have shown values lower than recommended because of a state of chronic low-grade inflammation, resulting in increased metabolic demands. Nowadays, disparities exist regarding the recommended dose of FA in women at risk, including women of childbearing age with excessive weight. Therefore, this systematic review investigated if European childbearing age/pregnant women with overweight/obesity are supplemented according to the current country-specific FA recommendations and whether the dosage of 5 mg recommended for pregnant women with obesity effectively prevents NTDs.
Methods: The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed. Manuscripts were searched electronically on the Web of Sciences, PubMed, and Medline. The quality of the included studies was assessed using the Quality Assessment for Diverse Studies statement.
Results: Of the 1,718 records identified, 8 studies met the inclusion criteria. The overall quality of the included studies was high, with the majority scoring above 70%, reflecting robust methodological standards.

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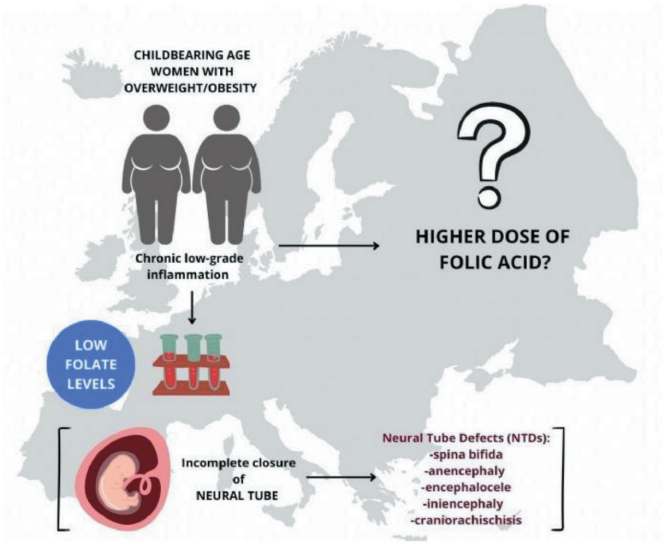
The findings revealed a pervasive lack of adherence to recommended FA dosages among pregnant women, particularly those with overweight/obesity where adherence rates ranged from 4% to 9.5%, accompanied by consistently low serum folate levels. While three studies examined FA supplementation during the preconception period, the remaining studies focused on initiation during the first trimester, highlighting that European pregnant women are not particularly adherent to recommendations during the period of greatest need.

Conclusions: The scarce adherence to the current guidelines shows an urgent need to standardize the recommendations across European countries. Particularly, women of childbearing age with excess weight should be monitored assessing serum folate, RBC folate, and homocysteine levels developing tailored supplementation protocols, to counteract the occurrence of NTDs.

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Fig. 1. Graphical Abstract.



PO2.111

Prevalence and Associated Factors of Sarcopenia Among Elderly Koreans: Findings from KNHANES 2022–2023

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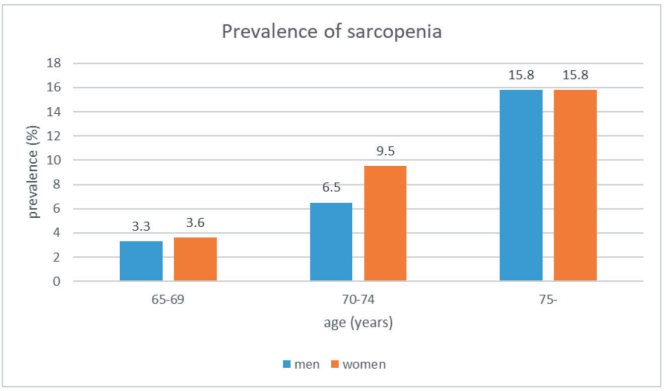
Purpose: The prevalence of sarcopenia varies across populations and is influenced by diagnostic criteria, assessment methods, and population characteristics. This study aimed to provide updated estimates of sarcopenia prevalence in Koreans using the Asian Working Group for Sarcopenia (AWGS) criteria and to identify associated factors in the elderly population.

Methods: This cross-sectional study utilized data from 2688 participants aged 65 years and older in the Korea National Health and Nutrition Examination Survey (KNHANES) 2022–2023. Sarcopenia was diagnosed based on the AWGS criteria, and its prevalence was estimated. A complex-sample logistic regression analysis was performed to evaluate the relationship between sarcopenia and sociodemographic, lifestyle, and health-related factors, adjusting for potential confounders.

Results: The overall prevalence of sarcopenia was 9.5%, with a prevalence of 8.5% in men and 10.2% in women. In participants aged 75 years and older, the prevalence increased significantly to 15.8%. Adjusted logistic regression analyses revealed that inadequate energy intake (OR=2.05, 95% CI: 1.22–3.43, p=0.007), diabetes (OR=1.52, 95% CI: 1.05–2.20, p=0.027), and older age (≥75 years: OR=4.28, 95% CI: 2.56–7.16, p<0.001) were strongly associated with sarcopenia. Protective factors included regular strengthening exercise (OR=0.47, 95% CI: 0.30–0.75, p=0.001), higher BMI (≥25 kg/m²: OR=0.16, 95% CI: 0.09–0.29, p<0.001), living in rural areas (OR=0.64, 95% CI: 0.42–0.98, p=0.040), and higher education levels (≥High school: OR=0.62, 95% CI: 0.40–0.97, p=0.036).

Conclusions: This study highlights the importance of using updated data to estimate the prevalence of sarcopenia and its associated factors in Koreans. Adequate nutritional intake, regular physical activity, and maintaining a healthy BMI play crucial roles in reducing the risk of sarcopenia. Public health initiatives should focus on identifying at-risk individuals and promoting interventions to mitigate the burden of sarcopenia in aging populations.

Fig. 1. Prevalence of sarcopenia.



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Tab. 1. Multivariable regression analysis between factors associated with sarcopenia.

	factor (reference)	Crude OR (95% CI)	P-value	Adjused OR (95% CI)	P-value
age	70-74 (65-69)	2.44 (1.55-3.83)	<.001	2.72 (1.55-4.77)	<.001
	≥75 (65-69)	5.18 (3.48-7.70)	<.001	4.28 (2.56-7.16)	<.001
sex	women (men)	1.23 (0.93-1.61)	0.146	1.25 (0.77-2.01)	0.365
Income	3rd, 4th quartiles (1st, 2nd quartiles)	0.48 (0.32-0.71)	<.001	0.97 (0.60-1.58)	0.900
Residence	Rural (City)	1.10 (0.78-1.53)	0.594	0.64 (0.42-0.98)	0.040
Spouse	No (Yes)	1.83 (1.37-2.43)	<.001	1.47 (0.97-2.22)	0.069
Diabetes		1.39 (1.04-1.87)	0.027	1.52 (1.05-2.20)	0.027
Hypertension		1.16 (0.87-1.55)	0.317	1.30 (0.88-1.94)	0.191
Hypercholesterolemia		0.84 (0.61-1.14)	0.259	0.93 (0.62-1.40)	0.723
Hypertriglyceridemia		0.87 (0.50-1.49)	0.61	1.51 (0.84-2.71)	0.170
Anemia		1.93 (1.43-2.61) *	<.001	1.43 (0.94-2.19)	0.096
Chronic Kidney Disease		1.74 (1.16-2.59) *	<.001	1.20 (0.69-2.08)	0.513
Poor self-rated health		1.60 (1.20-2.14) *	<.001	1.11 (0.75-1.64)	0.606
Regular physical activity		0.51 (0.37-0.74) *	<.001	0.64 (0.40-1.02)	0.062
Strengthening exercise ≥ 2 times/Week		0.41 (0.28-0.61)	<.001	0.47 (0.30-0.75)	0.001
Current smoker		1.12 (0.72-1.76)	0.618	1.15 (0.58-2.31)	0.685
Alcohol drink		0.44 (0.31-0.62)	<.001	0.61 (0.38-0.96)	0.034
Inadequate energy intake		2.13 (1.56-2.91)	<.001	2.05 (1.22-3.43)	0.007
Inadequate protein intake		1.93 (1.45-2.56)	<.001	0.80 (0.51-1.26)	0.334
Weekday sleep duration (hours)	≤ 5 (6-7)	1.05 (0.71-1.56)	0.808	0.79 (0.48-1.29)	0.349
	≥ 8 (6-7)	1.27 (0.90-1.78)	0.171	1.13 (0.75-1.70)	0.560
Body mass index (kg/m2)	<18.5 (18.5≤ BMI <23)	2.44 (1.41-4.23)	<.001	2.99 (1.47-6.07)	<.001
	23 ≤ BMI<25 (18.5≤ BMI <23)	0.47 (0.33-0.68)	<.001	0.52 (0.34-0.81)	<.001
	≥ 25 (18.5≤ BMI <23)	0.18 (0.12-0.28)	<.001	0.16 (0.09-0.29)	<.001
Unintentional weight loss		1.63 (1.12-2.39)	0.011	1.04 (0.65-1.68)	0.859

Values represent odds ratio (95% confidence interval) for sarcopenia using complex sample logistic regression model Multiple logistic regression model adjusted for age, sex, income, education, residence, marital status, chronic diseases, self-rated health, physical activity, strengthening exercise, smoking status, alcohol drink, energy intake, protein intake, sleep duration, body mass index, and unintentional weight loss.

PO2.112

"A Study on the Relationship Between Night Eating Behaviors and Sleep Quality in Nutrition and Dietetics Students from Turkey"

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Introduction: Night Eating Syndrome (NES) is characterized by individuals' tendency to overeat after dinner, negatively impacting their sleep patterns (Sakthivel, Hay, & Mannan, 2023). According to studies, dietary habits have a significant effect on an individual's sleep patterns and overall health status (Godos et al. (2021). With the diagnostic criteria developed by Allison and colleagues in 2010 (Allison et al., 2010), the prevalence of Night Eating Syndrome in the population has been more systematically assessed, paving the way for further research in this field.

Methods: This cross-sectional study was conducted among students of the Department of Nutrition and Dietetics at Aydın Adnan Menderes University. University students were selected as the study population because this group has characteristics that provide valuable insights into night eating syndrome and sleep quality in terms of lifestyle and dietary habits. A survey was administered to the participants through an online Google Forms platform.The survey consists of five main sections: demographic information, general health status, dietary habits, night eating syndrome, and sleep quality. Dietary habits were assessed using the Food Frequency Questionnaire; night eating syndrome was determined using the Night Eating Syndrome Diagnostic Questionnaire. Participants' sleep quality was measured using the Pittsburgh Sleep Quality Index (PSQI). The obtained data were analyzed using statistical methods to examine the possible relationship between night eating habits, dietary frequency, and sleep quality.

Results: Among the 197 participants in the study, 87.3% (172 individuals) were female, and 12.7% (25 individuals) were male. Twelve participants had a high Night Eating Syndrome (NES) score, which corresponds to 6.1% of the sample. Regarding sleep quality, 55.8% (110 individuals) were found to have "good sleep quality," while 44.2% (87 individuals) had "poor sleep quality." Additionally, 46.2% (91 individuals) of the participants reported using vitamin and mineral supplements. The most commonly used supplement was vitamin D, with its usage rate being significantly higher compared to other vitamin and mineral supplements. According to the tea consumption data, 4.6% (9 individuals) of the participants consumed five or more cups of tea per day. The arithmetic mean of the participants' Body Mass Index (BMI) was 21.94 ± 3.71. The proportion of participants with a BMI above 30 was 3.05%. Furthermore, 27.9% of the participants were smokers.

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Conclusion: Poor sleep quality is common among university students. A stressful lifestyle, physical activity, and dietary habits can affect the sleep cycle. High BMI often reflects inadequate nutrition and a sedentary lifestyle. Reducing unhealthy food intake and increasing physical activity can improve sleep quality and bring BMI to healthy levels, thereby enhancing overall student health.

Conflict of Interest: The authors declare that there is no conflict of interest related to this research.

Funding: This research did not receive any specific funding.

PO2.114

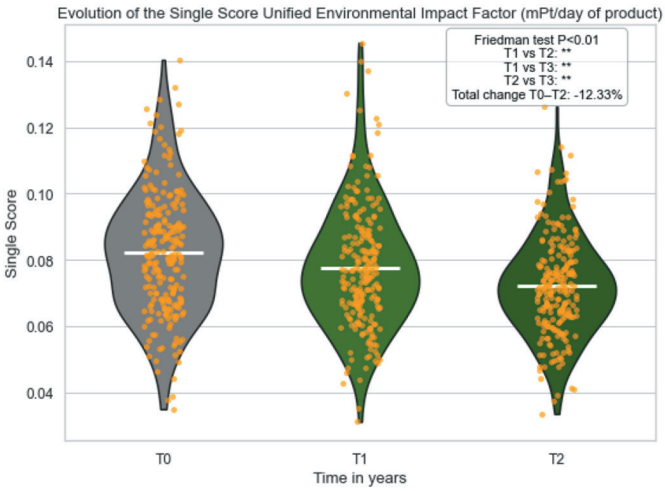
The Mediterranean diet, a useful way to reduce the environmental impact and the intake and exposure of food contaminants

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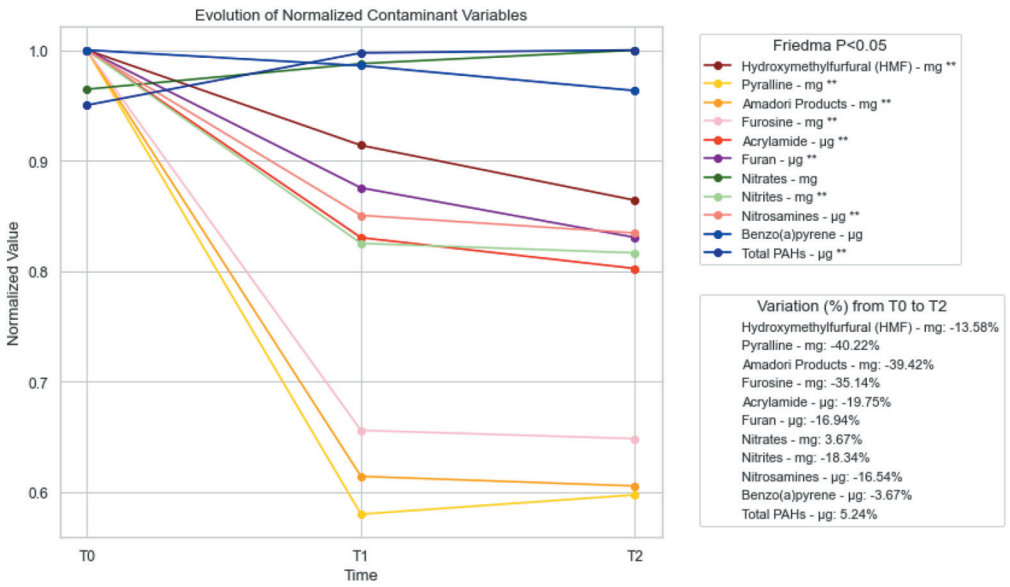
Introduction: A combination of climate change and the degradation of natural resources represents a significant risk to the availability and safety of food. In addition to this, changes in dietary habits towards the consumption of more processed foods are also contributing to this issue. Food security consequently establishes as a key aspect in ensuring continued access to nutritious, safe and affordable food through more sustainable practices. Organisations such as the FAO are working to help achieve these goals. In this context, the adoption of diets characterised by high sustainability and greater consumption of natural and minimally processed foods is imperative to mitigate environmental impacts and enhance human health. The aim of this study was to evaluate the environmental impact over a two-year period of a dietary intervention involving a Mediterranean diet, and its effect on the intake and exposure of contaminants derived from food processing.

Methods: The dietary intake of 225 participants from the Malaga node of the PREDIMED-Plus study was assessed using a Food Frequency Questionnaire (FFQ) for the first two years of the study. Environmental parameters were evaluated using the Agribalyse® 3.0.1 database, which employs Life Cycle Analysis and Product Environmental Footprint methodology. The CONT11 database was used to calculate the intake of food contaminants. Friedman's test was used as a statistical analyses to compare samples and the level of significance was set at $P < 0.05$. Statistical analyses and figures were performed using the Python 3.7.



Evolution of the Single Score Unified Environmental Impact Factor (mPt/day of product) over time (T0, T1, T2). Violin plots show score distributions, with medians as white lines and individual data as orange dots. Significant reductions were observed ($P < 0.01$), with a total decrease from T0 to T2.

Fig. 1.



Evolution of normalized contaminant variables from T0 to T2. Each line represents a different contaminant. Percentage variation between T0 and T2 is indicated. ** Statistically significant differences for the variables (Friedman $P < 0.05$).

Fig. 2.

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Results: Subsequent to the dietary intervention, characterised by the adoption of a Mediterranean dietary pattern, the unified environmental impact score exhibited a progressive reduction from the beginning of the intervention until two years after its implementation (Figure 1). This trend was reinforced by statistically significant decreases over time in other parameters, including climate change indicators, ozone depletion and ionising radiation. Concurrently, a decline in particulate matter, acidification, eutrophication, and depletion of water and energy resources was also observed. Similar trend was observed in the analysis of most of the food contaminants analysed, such as hydroxymethylfurfural or acrylamide, which exhibited significant reductions (Figure 2). However, a slight increase in nitrite levels was observed, which was attributed to increased consumption of vegetables.
Conclusion: In conclusion, it can be seen that, following a 2-year intervention, the Mediterranean diet is a dietary pattern that can help to improve the sustainability of the population and achieve significant reductions in intake and exposure to contaminants from food processing.

PO2.115

Relationship Between Weight Stigma, Internalized Weight Bias, and Quality of Life in Individuals With Obesity: A Mediation Analysis

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Introduction: Obesity, defined as a body mass index (BMI) over 30 kg/m², affects nearly 38% of adults globally and is projected to surpass 50% by 2035 (World Obesity Federation, 2023). Beyond its economic impact, obesity poses significant risks to physical health, including cardiovascular disease, type 2 diabetes, and certain cancers. Traditional treatments often focus on weight loss through behavioral interventions but struggle with sustainability, highlighting the importance of psychosocial factors in obesity management.
Among these factors, weight stigma—negative societal attitudes and stereotypes about individuals living with obesity—has emerged as a critical yet underexplored dimension influencing both psychological and physical health. Stigmatizing experiences contribute to chronic stress, emotional distress, and maladaptive behaviors such as disordered eating, creating a harmful cycle of weight gain and stigma (Tomiyama, 2014). Over time, individuals internalize these stereotypes, leading to internalized weight bias (IWB), which exacerbates emotional distress, reduces self-efficacy, and hinders salutogenic behaviors like physical activity and healthy eating (Pearl and Puhl, 2018). Despite its profound impact, the mechanisms linking weight stigma, IWB, and quality of life (QoL) remain insufficiently understood. This study aims to investigate these relationships while exploring the mediating role of coping strategies in individuals with obesity.
Methods: A cross-sectional study was conducted with 89 participants living with obesity (mean age: 48.68 ± 12.92 years; mean BMI: 41.77 ± 7.98) recruited via associations and a university hospital. Participants completed five validated questionnaires assessing weight stigma experiences, IWB, coping strategies (adaptive and maladaptive), and QoL across emotional, social, and psychological domains. Correlation, regression, and mediation analyses were performed to examine the hypothesized relationships.
Results: The results indicated a significant negative relationship between IWB and QoL ($\beta = -5.73$, $p < 0.001$, $R^2 = 30\%$). Mediation analyses revealed that coping strategies played a key role in this relationship. Adaptive coping partially mediated the effect of IWB on QoL (β_indirect = -2.8, $p < 0.01$), while maladaptive coping fully mediated the relationship (β_indirect = -4, $p < 0.001$). Notably, the direct effect of IWB on QoL became non-significant when maladaptive coping was included, underscoring its pivotal role in influencing QoL.
Conclusion: This study highlights the complex interplay between IWB, coping mechanisms, and QoL in individuals living with obesity. Interventions targeting IWB and promoting adaptive coping strategies could substantially enhance psychological well-being and QoL in this population. These findings provide actionable insights for healthcare providers and policymakers aiming to reduce the adverse effects of weight stigma.

PO2.116

Preoperative patient perspectives on weight-loss surgery "- a qualitative analysis of physical and psychosocial expectations"

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Introduction: Weight-loss surgery is often perceived as a last resort for individuals struggling with obesity. However, patient experiences and the social stigma surrounding obesity can significantly influence their decision-making process. This study explores the personal pre-operative physical and psychosocial dimensions of undergoing weight-loss surgery through in-depth interviews with patients.
Methods: Thirteen semi-structured interviews were conducted with patients during the decision-making process in the time span between a mandatory preoperative informational session and their consultation with the bariatric surgeon. A qualitative content analysis, guided by Patton's framework, was applied to identify themes related to preoperative patient expectations on future weight-loss surgery.
Results: Five overarching themes emerged from the data: (1) Stigma and societal judgment - participants reported pervasive experiences of stigma both within healthcare settings and broader social contexts, often feeling judged regardless of their efforts; (2) Surgery as a tool, not a quick fix - patients emphasized that the decision to undergo surgery was a result of prolonged struggles with weight management and was viewed as a necessary step for health improvement; (3) Social and emotional limitations - overweight status impacted participants' ability to engage in social and physical activities, reinforcing feelings of isolation; (4) Expectations for improved quality of life - participants expressed hopes for increased energy, reduced physical discomfort, and enhanced participation in family and social life; and (5) The importance of support - emotional and informational support from family, friends, and healthcare providers were identified as critical factors in the decision-making process and preparation for surgery.
Conclusions: This study highlights the profound impact of stigma and the complex interplay of physical, social, and emotional factors in the experiences of individuals considering weight-loss surgery. While participants expressed optimism about the surgery's potential to improve their health and quality of life, the findings underscore the need for empathetic and holistic approaches in healthcare to address stigma and support patients through their journeys.

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PO2.117

Waist circumference-years and cancer risk: A prospective study of the association and comparison of predictive performance with waist circumference and body mass index

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Introduction: Associations of waist circumferences (WC) and body mass index (BMI) measured once or over time with cancer incidence were studied. WC is associated with some cancers independent of BMI (1). There is limited research on exposure to cumulative central adiposity and cancer risk. This study investigates the relationship between waist circumference-years, which incorporates exposure time to WC ≥ 102 cm in men or ≥ 88 cm in women, and cancer risk. We compared these findings to those from single WC or BMI measurements.
Methods: Serial WC measurements taken over 9 years in the Atherosclerosis Risk in Communities Study (ARIC), a prospective cohort study in the United States, were used to predict yearly WC measurements. Cox proportional hazards regression, adjusted for age at baseline, race, alcohol consumption, hormone therapy use (in women) and cigarette smoking, was used to estimate the hazard ratios of cancer incidence for waist circumference-years, WC or BMI, measured in Visit 4. Harrell's C-statistic quantified the predictive performance of these metrics.
Results: A total of 10,172 participants (4,536 men and 5,636 women) were followed up for cancer from Visit 4 of the ARIC cohort, over a median of 13.7 years for men and 15.8 years for women. During follow-up, 1,514 men and 1,239 women were diagnosed with a first primary cancer. The mean age for men was 63 years (standard deviation (SD) 6), and the mean age for women was 62 years (SD 6). The mean WC at baseline for men was 103 cm (SD 12), and for women was 101 cm (SD 16). 19% of men and 27 % of women were Black. On average, exposure to waist circumference-years was 32 cm-years (SD 58) for men and 101 cm-years (SD 113) for women. For obesity-related cancers, the hazard ratios per SD of waist circumference-years were 1.14 (95% CI: 1.04, 1.25) for men and 1.19 (95% CI: 1.12, 1.27) for women. The differences in predictive performance between the metrics were marginal.
Conclusion: This is the first study to identify positive associations between waist circumference-years and cancer incidence. Waist circumference-years did not provide additional information on cancer risk beyond that of WC and BMI. Single WC measurements may be sufficient, but BMI remains the preferred metric due to its routine use in clinical practice.

Reference

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Conflict of Interest: None Disclosed.

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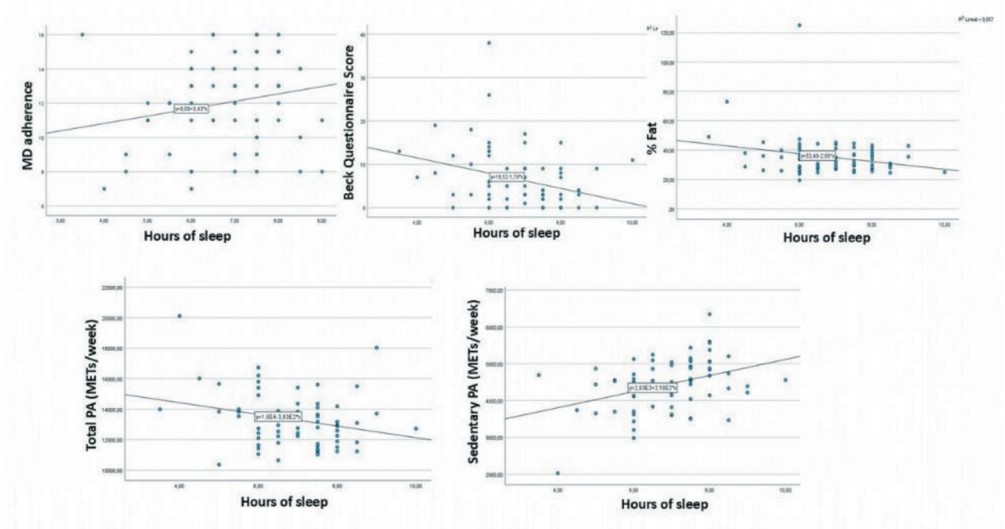
PO2.118

Sleeping duration and health outcomes in adults with overweight or obesity

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Background: Sleep's importance for overall health is increasingly recognized in health research. This study aimed to assess the association between sleep duration and health outcomes in adults with overweight or obesity.



Scatter plot graphics and regression lines of total hours of sleep and MD adherence, beck depression inventory questionnaire, total PA/METs week, sedentary PA/METs week and % of fat mass.

Fig. 1.

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Methods: Cross-sectional survey carried out on participants (n=155; aged 40–60 years) with overweight or obesity. Sociodemographic data, body measurements, and depression levels using the Beck Depression Inventory Questionnaire (BDI) were collected. Physical activity (PA) was assessed with accelerometers, dietary data with Mediterranean diet (MD) adherence, and food frequency questionnaires. Sleep hours were determined using the Pittsburgh Sleep Quality Index Questionnaire, and sleep duration was divided into tertiles for the analysis.
Results: Pearson analysis showed that sleep hours were inversely correlated with fat mass in kg and percentage, BDI and total and moderate PA, and directly correlated with sedentary PA and MD adherence. Crude and adjusted OR of BDI were lower in T2 than in T3. Crude and adjusted OR of PA and fat mass (%) were lower in T3 compared to other tertiles, while crude and adjusted OR on sedentary PA was higher in T3.
Conclusion: Sleep has a vital role in maintaining a healthy lifestyle in adults with overweight or obesity. Adhering to recommended sleep durations correlates with lower depression levels, reduced sedentary behavior, and improved body fat percentage. Addressing these factors can support optimal health and well-being throughout life.

Funding: This study was funded by Instituto de Salud Carlos III (CIBEROBN CB12/03/30038), cofunded by the European Regional Development Fund. IDISBA Grants (FOLIUM, PRIMUS, SYNERGIA, and LIBERI).

PO2.119

The association of body mass index with cognitive health in dementia-free middle-aged adults: The ALBION study

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Introduction: Given the increase in the aging population and thus in the prevalence of dementia, the identification of protective factors against cognitive decline is necessary [1]. The association between obesity and cognitive health is complex [2]. In this work we focus on the potential associations between body mass index (BMI) and changes in cognition over 3 years in a cohort of dementia-free middle-aged-adults, as well as the potential associations between BMI and cerebrospinal fluid (CSF) biomarkers of neurodegeneration.
Methods: This analysis is part of the ALBION study. Each volunteer underwent a detailed battery of neuropsychological tests and neurological assessment at baseline and annually thereafter. In addition, sociodemographic data and anthropometric parameters were recorded at baseline. CSF samples were also collected. Generalized estimating equations (GEE) models were used to examine whether BMI was associated with rates of change in cognitive status over time. Multivariate logistic regression analyses were conducted with BMI as independent variable and CSF Alzheimer's Disease (AD) biomarkers [amyloid-β (Aβ) burden, Tau/Aβ and PTau/Aβ ratios] as the dependent variables.
Results: Of the 215 baseline participants without dementia, 62% were female, with an average age of 65±9.8 years, 14±3.6 years of education and an average BMI of 26.5±4.3 kg/m2. Furthermore, 34.4% of the participants had mild cognitive impairment, 49.8% had pathological Aβ burden, and 28% had pathological ratios of Tau/Aβ and PTau/Aβ. GEE models revealed that higher BMI was associated with greater decline in attention speed z-score over time (a 15% reduction in standard deviation for every unit increase in BMI each additional year of follow-up; p=0.045), even after adjusting for confounders (age, sex, education years). BMI was not associated with the other cognitive domains or with Aβ burden, Tau/Aβ and PTau/Aβ ratios.
Conclusion: Our findings indicate that, in dementia-free middle-aged adults, an increase in BMI is associated with a greater decline in attention speed performance over time, without being associated with primary AD biomarkers. Therefore, we suggest that an increase in BMI should be considered in future studies and assessed by health professionals in clinical practice as a factor potentially influencing cognitive function.

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PO2.120

Analysis of risk factors according to gender in people with type 2 diabetes and fractures; analysis of muscle mass and fat mass using dual-energy X-ray absorptiometry

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Introduction: As testing and diagnostic standards for sarcopenia using dual-energy X-ray absorptiometry (DEXA) have been established, but there are still many limitations in interpreting the resulting muscle mass and body fat mass results. Moreover, because menopause occurs after the age of fifty in women, changes in the musculoskeletal system progress differently depending on gender. Therefore, in this study, we aimed to analyze the differences in fracture risk factors between men and women when combining the patient's history and test results by analyzing the muscle mass and body fat mass results obtained through DEXA testing in people with type 2 diabetes and fractures.
Methods: This retrospective study was conducted at Jeonbuk National University Hospital in South Korea. Adult patients aged nineteen years or older who hospitalization with fracture-related ICD codes and underwent body composition test by DEXA examination from 2020 to 2023 were eligible. Type 2 Diabetes (E11) and fractures were confirmed using ICD codes. Definition of sarcopenia was followed consensus by the Asia Working Group for Sarcopenia. Relative skeletal muscle index (RSMI), and area of visceral and subcutaneous adipose tissue (VAT, SAT) were collected through body composition test. The patient's past history (chronic renal failure, dialysis, atherosclerotic cardiovascular disease, liver cirrhosis, cancer, history of multiple fractures and recent fracture site), duration of diabetes, insulin use, T-score (spine, femur and hip) by DEXA and laboratory test results were collected using electronic medical records.
Results: Among 410 fracture patients who underwent DEXA testing, 135 patients (male 64 vs. female 74) had type 2 diabetes. Among these, 23 patients were receiving insulin treatment, and there was no difference between genders. Most of them were femur fracture patients (n=111), and bone mineral density (BMD) by DEXA showed that 24.6% (n=15) of men and 74.3% (n=55) of women had osteoporosis (p=0.000). Women had lower t-score values measured by DEXA at all locations of the spine, femur, and hip. In results of body composition test by DEXA, 73.8% of men and 44.6% of women had RSMI values lower than the reference value (p=0.001). Additionally, the area of SAT was measured to be higher in women (men, 60.57±44.10 m2 vs. women, 119.45±76.01 m2, p=0.000). There were no sex differences in hemoglobin, glycated hemoglobin, renal function, total calcium, and vitamin D levels.
Conclusion: The women were older and had a lower T-score corresponding to their fracture. In the case of men, even when fractures occur, bone density is more often normal, sarcopenia is clearly confirmed, and SAT is confirmed to be lower than that of women There was no significant difference in BMI values between men and women, and there was no difference in the number of patients with a BMI of less than 18.5 kg/m2 (men, n=6, vs. women, n=3). Therefore, it can be assumed that muscle mass index and subcutaneous fat mass obtained through DEXA test results may be more appropriate predictors of fracture for men than for women.

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PO2.121

Body Appreciation, Lifestyle Habits, and Health Perceptions among First-Year Students in Lithuania

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Introduction: Body appreciation refers to valuing and accepting one's body regardless of its size or shape, supporting mental and physical well-being, and encouraging healthier lifestyle practices. This study aimed to examine the relationships between body appreciation, body weight, lifestyle factors, and perceived health among first-year university students in Lithuania.
Methods: A cross-sectional online survey was carried out among first-year students at the four largest Lithuanian Universities of Applied Sciences during the 2021–2022 academic year. A total of 709 students (216 males and 493 females) completed a self-administered questionnaire that included the Body Appreciation Scale-2 (BAS-2). This scale consists of 10 items, each rated on a five-point Likert scale ranging from 1 (never) to 5 (always). Higher scores reflect a more positive perception of body image. Participants also provided self-reported weight, height, lifestyle habits, such as nutrition, physical activity, sleep hygiene, and subjective health data. Body mass index (BMI) was calculated using the reported weight and height measurements. The associations of BAS scores with BMI and perceived weight were analyzed using Spearman correlation analysis by gender. Multivariable linear regression analysis was used to associate the BAS scores with lifestyle factors, health perception, and other variables.
Results: Over 60% of students were classified as having normal weight. The prevalence of overweight (BMI ≥25) was significantly higher among males (31.8%) compared to females (24.8%), while underweight was 2.2 times more common in females ($p<0.05$). More females (34.5%) perceived themselves as "too fat" compared to males (17.1%), whereas males were 3.1 times more likely to consider themselves "too thin" than females ($p<0.05$). The median BAS score was 34 for females and 33 for males. Spearman correlation analysis showed a significant negative association between BAS scores, BMI, and perceived weight among females. Despite having lower rates of overweight, female students reported lower levels of body appreciation. Students with higher body appreciation reported healthier eating habits, increased physical activity, better sleep quality, and a more positive perception of health. Conversely, lower body appreciation was associated with sedentary behavior and higher consumption of sweets and fast food.
Conclusion: The findings suggest that body appreciation is influenced by body weight and strongly linked to lifestyle and health perceptions. Interventions that focus on improving lifestyle behaviors, such as balanced nutrition, regular exercise, and sleep hygiene, may contribute to fostering higher levels of body appreciation among students.

PO2.122

Cancer patients applying to the diet clinic assessment of nutritional knowledge levels, nutritional habits and nutritional supplement use status

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Introduction: Cancer and the treatments applied to the disease can cause nutritional deficiencies in patients with cancer. Medical nutrition therapy for cancer aims to maintain the individual's current weight, prevent the deterioration of their general condition, and prevent life-threatening complications in patients with malnutrition. This study aimed to determine the nutritional habits of cancer patients and to evaluate the effect of nutritional education and nutritional treatment given to these patients on their general nutritional status
Method: The study was conducted at Istanbul Medicine Hospital with a total of 54 volunteer adult (18-65 age) cancer patients (55.6% female n=30; 44.4% male n=24). An information form was collected to determine the demographic information, nutritional knowledge levels and nutritional habits of the cancer patients. After the initial survey the patients were given nutritional education about, basic food groups, the effectiveness of nutrition on cancer, cooking techniques, and the use of nutritional supplements were explained. A personalized nutrition program was created so that 50% of the total energy would come from carbohydrates, 20% from protein, and 25-30% from fat, and the individuals' nutritional follow-up was carried out until the 6th week. The Mediterranean Diet Adherence Screener (MEDAS) (>7: Medium level of adherence to the Mediterranean diet (MD), >9: High level of adherence to the MD) and anthropometric measurements (height, weight, body mass index (BMI)) were taken twice at the beginning and end of the study (6th week).
Results: A significant increase was found in the MEDAS score after the nutritional education ($p\leq0.05$) (Table 1).
Weight and BMI values were measured as 80.29±15.92 - 77.22±13.85 and 29.34±5.47 - 28.24±4.78, respectively, before and after education ($p\leq0.05$). According to BMI values, in the first week, 3.7% were person with underweight, 11.1% were person with normal weight, 44.4% were person with overweight, and 40.7% were person with obesity; in the 6th week, these values were was found to be 3,7%, 22.2%, 40.7%, 33.3% respectively. When BMI values are compared between the 1st and 6th weeks; a decrease was detected at the 6th week, there is a statistically significant difference ($p\leq0.05$).
In the evaluation of eating habits before and after the education, it was determined that the patients applied the correct cooking techniques more during the treatment process than before the education and it was found to be statistically significant ($p = 0.001$).
Conclusion: As nutritional knowledge increases, patients' compliance with a healthy and balanced diet has increased. It is thought that providing nutritional education and follow-up to patients with cancer will increase the quality of life and support medical treatment in malnourished or overweight individuals.

Conflict of Interest: None disclosed

Funding: No funding to report

Tab. 1. MEDAS Score.

Mediterrenean Diet Adherence Score	Before education	After education	
< 7	34	10	Medium level of adherence to the MD
%	63%	18.5%	
≥ 7	20	44	
%	37%	81.5%	
Total	54	54	p= 0,0005
<9	48	28	High level of adherence to the MD
%	88.9%	51.9%	
≥ 9	6	26	
%	11.1%	48.10%	
Total	54	54	p= 0,0005

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PO2.123

Simulating heterogeneous weight and height trajectories for children and adult populations from the Health Survey for England

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Introduction: Obesity is a major public health challenge with significant economic and societal costs. Effective policy interventions are crucial to combat this issue, but evaluating their long-term impact requires robust and efficient methods of assessing their potential effectiveness. While individual-level simulation models are valuable tools, reliance on longitudinal data can present challenges. They can be computationally demanding and require extensive data collection. Historical trends may not accurately reflect future trajectories, especially in the context of evolving lifestyle factors and interventions. This study aims to develop and evaluate a novel, computationally efficient method for simulating heterogeneous weight and height trajectories for both adults and children using readily available cross-sectional data.
Method: The Health Survey for England (HSE) collects cross-sectional data for a representative sample of adults and children in England. Lognormal distributions were fitted to height and weight data from the HSE 2014 by age and sex groups. Lognormal distributions were selected to capture skewness in the data. Simulated individuals representative of the 2014 dataset were allocated a percentile score at baseline to describe their position on the statistical distribution for their age and sex group. Future height and weight values were simulated from the differences in weight or height across age groups by sex for individuals with a matching percentile score. Trajectory computation time to generate lifetime trajectories for 100,000 people was estimated in R 4.4.1. Simulated data were compared with individual level data from Health Survey for England 2019. Graphical visualisations and Kolmogorov-Smirnov tests were generated to compare simulated results for weight, height and body mass index (BMI) with observed individual data. Summary results for the simulated prevalence of overweight and obesity for adults were compared with 2022 national statistics.
Results: The method demonstrates a computationally efficient method, generating lifetime trajectories for 100,000 individuals in 29 seconds. Graphical visualisations demonstrated that the simulated 2019 data provided a reasonable visual fit to the mean and variation in observed height, weight and body mass index across sub-groups. The KS test indicated partial fit to the data. The 2022 simulated prevalence of overweight and obesity in adults was 64% and 26% respectively, compared with 64% and 29% from observed data.
Discussion: Simulating height and weight trajectories using cross-sectional data offers a computationally efficient and flexible method to generate height and weight trajectories. The method produces reasonable fit, with limitations. The key strengths of the approach are that it offers an efficient approach to update models with new data, preserves individual heterogeneity, and is straightforward to implement. Further research is needed to evaluate whether alternative statistical distributions improve fit and develop methods to incorporate cohort trends.

PO2.124

The influence of body mass index on attitude toward physical activity

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Introduction: Physical activity is important for maintaining physical and mental health. Inactivity increases the risk of developing obesity and obesity related diseases. Individuals' attitudes towards physical activity are one of the factors in their engagement in regular exercise. Many overweight individuals have negative attitudes towards physical activity, mostly due to low self-esteem, past negative experiences or lack of support.
Objective: The aim of the study was to assess attitudes towards physical activity among overweight and individuals with obesity and to identify potential barriers.
Methods: A cross-sectional, non-interventional, descriptive study was conducted as an online survey, using a structured qustionnaire distributed via social media. It comprised of 13 questions divided into two main categories: demographic data (age, sex, BMI) and questions on attitude toward physical activity. The questionnaire covered a multidimensional assessment - motivation, exercise frequency, prefered exercise type, impact of chronic diseases and subjective feelings towards exercise.
Results: Of the 728 answers obtained 707 were included into further analysis (subjects not revealing their BMI were excluded). Most participants were female (93%), age 30-50 years (67%).
There was a signifficant difference between participants regarding their BMI: those with lower BMI had a more positive attitude towards physical activity and exercised more frequently (p=0,00 for both)). 79% of participants with BMI 25–30 kg/m² 79% enjoyed physical activity; 58% are being active 1–3 days per week and 29% 4–5 days per week. Participants with BMI over 40kg/m² reported enjoying physical activity in 35%; 29% being active 1-3 days per week and 13% being active 4–5 days per week. Participants with lower BMI more often chose intense activities (guided exercise, hiking) in comparison to participants with higher BMI, who prefered walking (p=0,035). Those with chronic conditions reported lower levels of physical activity compared to participants without chronic conditions (p = 0.039). While the most common reason for not being active was lack of time (60%), 15% of our subjects feel judged because of their appearance.
Conclusion: There was a signifficant difference between participants regarding their BMI: those with lower BMI had a more positive attitude towards physical activity, exercised more frequently and chose more intensive exercise. Obesity stigma is an important barrier in regular physical altivity.

PO2.125

New-onset type 2 diabetes mellitus and obesity-related cancer risk after matching on body mass index and accounting for detection-time bias: a UK Biobank study

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Introduction: The literature describes associations between type 2 diabetes mellitus (T2DM) and higher risk of several obesity-related cancers (ORCs). However, it remains unclear whether these associations are causal, due to confounding (e.g. mutual risk factor of obesity); immortal time bias (many studies combine prevalent and new-onset T2DM); or time detection bias (e.g. the co-diagnosis of two relatively common conditions at the same time). In this study, we addressed these previous shortcomings.
Methods: We performed a matched cohort control study within UK Biobank of new-onset T2DM (defined by date of first reported non-insulin dependent diabetes mellitus (E11)) versus unexposed individuals matched (1 to 3) on body mass index (BMI), age, and sex without replacement using a sequential longitudinal method. Participants were matched using a calliper width of 0.2 standard deviations for BMI and an interval < 5 years for age. The primary outcome was incident ORC (13 cancer types), and the secondary outcomes were site-specific ORCs including colorectal, endometrial, post-menopausal breast, pancreatic, and hepatocellular carcinoma. We developed Cox models to estimate the hazard ratio (HR) and 95% confidence intervals (CIs) for cancer outcomes. The primary model

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was time-split at 1 year to account for detection-time bias, and adjusted for alcohol and smoking by using current, previous, and never categorisation.
Results: A total of 27,601 participants with T2DM were well matched with 82,685 controls. Over a median follow-up time of 7.66 years, there were 2439 new primary cancers among T2DM participants and 5162 new primary cancers among matched controls. There was evidence for a BMI-independent effect of new-onset T2DM on ORCs in men (HR: 1.54, 95% CI (1.35-1.77), P<0.001) and women (HR: 1.22, 95% CI (1.07-1.39), P=0.03). However, there were no associations with several site-specific ORCs – notably colorectal cancer in women, endometrial, and post-menopausal breast cancer. There were positive associations for colorectal cancer in men (HR=1.41,95% CI (1.15-1.76), P=0.001); pancreatic cancer in men (HR=1.52, 95% CI (1.01-2.29), P=0.04) and women (HR=2.90, 95% CI (1.71-4.93), P<0.001); and hepatocellular carcinoma in men (HR=3.81, 95% CI (2.37-6.13), P<0.001) and women (HR=15.74, 95% CI (2.34-105.72), P=0.005).
Conclusion: Having accounted for key biases (immortal time bias, time detection bias) and confounding (matched on BMI), our findings indicate that new-onset T2DM is associated with some but not all site-specific obesity-related cancers. In turn, the pathways through which T2DM may affect obesity-related cancer require further investigation.

Conflict of Interest: None

Funding: Cancer Research UK

PO2.126

Risk of cardio-cerebrovascular disease according to changes in obesity and abdominal obesity before and after menopause in peri-menopausal women

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Introduction: Physiological changes occur iIn menopausal women owing, physiological changes occur due to hormonal imbalances, resulting in increased obesity and abdominal obesity. This increase in abdominal fat increases the risk of metabolic syndrome and cardiovascular disease. In this study, changes in the obesity and abdominal obesity status ofin peri-menopausal women were longitudinally evaluated longitudinally, and the risk of developing cardiovascular and cerebrovascular diseases was determined studied.
Methods: Thise study included menopausal women among those who underwent cancer screening conducted by the Korean National Health Insurance Service betweenfrom January 1, 2012, andto December 31, 2017. Women in the peri-menopauseal transition period were drefinerred asto those who had not reached menopause up to within 3 years prior to the cancer the screening. Thise study analyzed the risk of cardiocerebrovascular disease according with to changes in obesity and abdominal obesity changes before and after menopause.
Results: Results indicated that women who were not obese before menopause but were obese after menopause and those who were obese before and after menopause had a high risk of cardio-cerebrovascular diseases (HR], 95% CI: 1·141, 1·054–1·236 vs. HR, 95% CI: 1·167, 1·113–1·225). In the case of women who were not obese after menopause, there was no significant difference was found in the risk of cardio-cerebrovascular disease between obese and non-obese women before menopause. The group with pre-menopausal abdominal obesity, but not post-menopausal abdominal obesity, had an increased risk of cardio-cerebrovascular disease (HR, 95% CI: 1·132, 1·039–1·234).
Conclusion: Theo prevention of cardio-cerebrovascular diseases in peri-menopausal women during the menopausal transition period and, management ofmanaging post-menopausal obesity and pre- and post-menopausal abdominal obesity areis crucial.

Conflict of Interest: None Disclosed/Author has worked with...

Funding: No funding to report

Tab. 3.

Outcome	Abdominal obesity	N	Event	HR_M1	HR_M2	HR_M3	HR_M4	HR_M5
Myocardial infarction	No->No	300,446	1,431	1 (Ref.)	1 (Ref.)	1 (Ref.)	1 (Ref.)	1 (Ref.)
Myocardial infarction	No->Yes	31,059	184	1.268 (1.088–1.478)	1.227 (1.052–1.431)	1.221 (1.046–1.424)	1.142 (0.978–1.333)	1.146 (0.982–1.339)
Myocardial infarction	Yes->No	17,857	125	1.448 (1.206–1.738)	1.392 (1.159–1.672)	1.383 (1.151–1.661)	1.28 (1.065–1.539	1.287 (1.07–1.548)
Myocardial infarction	Yes->Yes	30,548	245	1.71 (1.493–1.958)	1.618 (1.411–1.854)	1.598 (1.394–1.832	1.384 (1.201–1.595)	1.398 (1.213–1.611)
Stroke	No->No	300,446	6,021	1 (Ref.)	1 (Ref.)	1 (Ref.)	1 (Ref.)	1 (Ref.)
Stroke	No->Yes	31,059	766	1.258 (1.167–1.356)	1.198 (1.111–1.292)	1.192 (1.105–1.285)	1.098 (1.017–1.184)	1.101 (1.02–1.188)
Stroke	Yes->No	17,857	457	1.26 (1.146–1.386)	1.189 (1.081–1.308)	1.184 (1.076–1.302)	1.086 (0.986–1.195)	1.09 (0.99–1.2)
Stroke	Yes->Yes	30,548	892	1.485 (1.384–1.593)	1.368 (1.274–1.468)	1.355 (1.263–1.455)	1.149 (1.068–1.236)	1.161 (1.079–1.249)
Composite outcome	No->No	300,446	7,323	1 (Ref.)	1 (Ref.)	1 (Ref.)	1 (Ref.)	1 (Ref.)
Composite outcome	No->Yes	31,059	938	1.267 (1.184–1.356)	1.211 (1.132–1.297)	1.205 (1.126–1.29)	1.113 (1.04–1.192)	1.117 (1.043–1.196)
Composite outcome	Yes->No	17,857	573	1.301 (1.195–1.416)	1.233 (1.132–1.342)	1.227 (1.127–1.336)	1.127 (1.035–1.228)	1.132 (1.039–1.234)
Composite outcome	Yes->Yes	30,548	1,113	1.526 (1.433–1.625)	1.415 (1.328–1.508)	1.402 (1.315–1.494)	1.193 (1.118–1.274)	1.206 (1.129–1.288)

Relationship between changes in abdominal obesity and cardiocerebrovascular diseases in peri-menopause

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PO2.127

Awareness of Obesity as a Disease Does Not Prevent Stigma: Education Is Not Enough

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Introduction: Obesity is a complex disease deeply rooted in negative unconscious biases within the population. The hypothesis that better knowledge of obesity can help reduce negative attitudes related to weight remains to be fully explored. This study aims to describe the extent of negative opinions associated with obesity among adult population and assess differences between those who believe obesity is a disease and those who attribute it to a lack of self-control.

Methods: A cross-sectional observational study was conducted in February 2023, comprising 1,000 personal telephone interviews representative of the Spanish population aged 18 and older. Twenty-five closed-ended questions were designed to assess perceptions, prejudice, and discrimination related to individuals with obesity. Descriptive statistics were expressed as percentages, and Pearson chi-square tests were performed to evaluate differences between groups.

Results: The sample comprised 52.1% women, with a mean age of 49.1±16.1 years and a self-reported BMI of 25.4±7.2 kg/m² (16.8% with obesity). Among the 59.2% (95% CI: 56.1%–62.2%) who perceived obesity as a disease, the majority were women (66.4%), belonged to a high or medium-high social class (64.5%), and were college graduates (63.1%). This group also showed greater awareness that weight regulation depends on biological, genetic, and environmental factors rather than solely on willpower (58.4% vs. 35.2%; p<0.001) and that treating obesity requires more than just eating less and exercising more (48.6% vs. 17.6%; p<0.001). Furthermore, they were more likely to agree that medications for obesity should be fully or significantly funded by the Public Health System (74.3% vs. 56.6%; p<0.001) and that society discriminates against individuals living with obesity or excess weight (78.7% vs. 66.4%; p<0.001). However, nearly one-third of participants who viewed obesity as a disease admitted having, at some point, experienced prejudice or rejection toward a person living with obesity—a percentage identical to those who believed obesity stems from personal responsibility (29.0% vs. 29.1%, p=0.982). Additionally, both groups shared similar views regarding individuals with obesity, showing no differences in perceptions of their aptitudes for managerial roles or public office. Both groups also expressed comparable levels of discomfort if their children's friends were very or quite overweight (44.0% vs. 38.9%, p=0.029), reticence toward romantic relationships with a partner living with obesity, and acceptance of individuals with excess weight in positions of authority, such as politicians or bosses.

Conclusions: Viewing obesity as a disease is associated with specific opinions about its causes and treatment but does not translate into less discriminatory attitudes toward individuals living with obesity. Further research is needed to investigate whether framing obesity as a medical condition reduces stigma against people with obesity.

PO2.128

Do dietary choices correlate with FAM19A5 protein concentration in people with metabolic syndrome? - The PROG-FAM observational study

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Introduction: FAM19A5 is a novel adipokine implicated in metabolic and inflammatory pathways, with emerging evidence highlighting its role in obesity and metabolic syndrome (MetS). Adipose tissue secretes adipokines that regulate glucose and lipid metabolism, inflammation, and appetite. Importantly, nutrition is central to MetS pathogenesis, as dietary habits directly influence adipokine secretion and metabolic health. While FAM19A5 expression is reduced in obesity and obesity-induced inflammation, its association with dietary choices in patients with MetS remains poorly understood, underscoring the need for further investigation into the interplay between nutrition and FAM19A5.The aim of the study was to access the correlation between the concentration of FAM19A5 in the serum of people with MetS and their dietary choices.

Materials-Methods: The study was designed as a case-control study. The procedures were conducted in the Department of Treatment of Obesity, Metabolic Disorders and Clinical Dietetics, Poznan University of Medical Sciences, Poznan, Poland. FAM19A5 serum concentration was assessed using an enzyme-linked immunosorbent assay. Participants completed questionnaires on nutrition, included Dietary Habits and Nutrition Beliefs Questionnaire and the manual for developing of nutritional data, Committee of Human Nutrition, Polish Academy of Sciences (KomPAN). The results obtained were considered significant when p<0.05.

Results: The study included 45 individuals with MetS (MetS group) and 35 without MetS (control group). The mean age was significantly higher in the MetS group (52.20±15.64 years) compared to the Control group (43.00±13.20 years, p<0.001). Mean serum FAM19A5 concentration was higher in MetS participants but did not reach statistical significance (163.16±55.11 pg/ml vs. 197.57±112.89 pg/ml, p=0.1341). Significant differences were observed in dietary habits assessed by the KomPAN questionnaire.

Across all participants, responses differed for questions: "Do you sweeten hot drinks?" (p=0.0296), and "How often do you eat fried foods?" (p=0.0196). Within the MetS group, significant differences were noted for questions: "How often do you eat fish?" (p=0.0477), and "How do you rate your physical activity in your free time?" (p=0.0400).

Serum FAM19A5 concentration was significantly associated with preferred meat preparation methods, with higher levels in those choosing BBQ (p=0.0386) or frying (p=0.0492).

Conclusion: While serum FAM19A5 levels were higher in individuals with MetS, the difference was insignificant. However, significant links between FAM19A5 levels and dietary preferences, such as BBQ or frying, suggest that diet-related behaviors may influence this adipokine. Observed differences in dietary habits, including sweetening hot drinks, consuming fried foods, and eating fish, further support this connection. These findings underscore the potential of dietary habits in influencing FAM19A5 and metabolic health, warranting further research to explore nutrition's role in managing MetS.

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PO2.129

Association between Pre-Pregnancy BMI and Anthropometry at Birth

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Introduction: The main objective of the study was to evaluate the association between pre-pregnancy body mass index (BMI) and anthropometry at birth.

Materials and Methods: The study population consisted of 786 mother-child pairs participating in the GENEIDA (Genetics, Environmental Exposures, and Infant Development in Andalusia) birth cohort, which is conducted at Hospital de Poniente, El Ejido, Almeria. In the first trimester of pregnancy, a structured questionnaire was used to collect information on the mother's pre-pregnancy weight and height, as well as socio-demographic characteristics and lifestyle factors (age, ethnicity, marital status, family income, educational level, parity, alcohol and tobacco consumption, exercise during pregnancy). A food consumption frequency questionnaire was also used to gather information on the mother's diet. Data on weight gain during pregnancy and anthropometric measurements (weight, height, and head circumference) of the newborns, gestational age, and sex were obtained from hospital records. Specific z-scores for birth weight, length, and head circumference were calculated using the newborn growth charts adjusted for gestational age and sex for the Spanish population (Carrascosa et al., 2004)

To assess the association between maternal pre-pregnancy BMI and newborn anthropometry, multiple regression models adjusted for maternal education level, maternal age, parity, weight gain during pregnancy, alcohol and tobacco consumption during pregnancy, average intake of vegetables, fruits, fish, meat, etc., were performed.

Results: The descriptive analysis of the mothers and newborns can be seen in Table 1. Multiple regression analysis showed that pre-pregnancy BMI was positively and significantly associated with infant birth weight, length, and head circumference. (Table 2) Logistic regression analysis showed a positive and significant association of pre-pregnancy BMI with the classification of large for gestational age at birth, defined by weight or height above the 90th percentile according to the spanish growth charts by Carrascosa (Adjusted OR: 1.072, p<0.000). (Table 3)

Conclusion: The results of this study indicate that pre-pregnancy BMI is positively and significantly associated with birth weight, length, and head circumference. It also shows a significant association with being classified as large for gestational age at birth, which has implication as a subsequent determinant of child obesity.

Tab. 1.

	Total (n=786)	No (%) or Mean ± SD
Maternal Age		30.93 ± 5.05
Married or stable partner	738	93.9%
Family´s monthly income		
<1000	152	19.3%
1000-2000	345	43.9%
2001-3000	219	27.9%
>3000	70	8.9%
Primary Education	403.21	51.3%
Secondary Education	182	23.3%
Higher Education	201	25.6%
Primiparous	302	38.4%
Multiparous	484	61.6%
Maternal Alcohol Consumption		
Never	165	21.0%
Only 1st Trimester	344	43.8%
During all pregnancy	277	35.2%
Non-smoker	651	82.8%
Smoker (Only 1st Trimester)	109	13.9%
Only 2nd and 3rd Trimester	91	11.6%
Pregnancy Weight Gain (kg)		11.27 ± 5.39
Male	396	50.4%
Female	390	49.6%
Gestational Age (weeks)		39.72 ± 1.50
Birth Weight (g)		3295.19 ± 457.84
Birth Length (cm)		50.55 ± 2.29
Head Circumference (cm)		33.69 ± 1.58
Small for Gestational Age (SGA)	67	8.5%
Adecuate for Gestational Age (AEG)	466	59.3%
Large for Gestational Age (LGA)	253	32.2%

Descriptive analysis of mothers and newborns

Tab. 2.

Dependent Variable	Independent Variable	Adjusted Beta	Lower CI	Upper CI	p-value
Newborn Weight Z-Score	Pre-pregnancy BMI	0.0376	0.0242	0.0510	0.0000
Height Z-Score	Pre-pregnancy BMI	0.0211	0.0041	0.0380	0.0149
Newborn Head Circumference Z-Score	Pre-pregnancy BMI	0.0276	0.0086	0.0465	0.0045
Ponderal Index	Pre-pregnancy BMI	0.0065	0.0027	0.0104	0.0009
Carrascosa Newborn Weight Z-Score	Pre-pregnancy BMI	0.0369	0.0221	0.0518	0.0000
Carrascosa Height Z-Score	Pre-pregnancy BMI	0.0180	-0.0003	0.0363	0.0538
Carrascosa Head Circumference Z-Score	Pre-pregnancy BMI	0.0295	0.0072	0.0518	0.0097

Multiple regression adjusted for ethnicity, education, previous pregnancies, income, alcohol, tobacco, stable partner, food frequency, maternal weight gain

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Tab. 3.

Dependent Variable	Independent Variable	F Dep	Adjusted OR	Lower CI	Upper CI	p-value
Weight or Height Percentile Category 10-90	Pre-pregnancy BMI	SGA	0.971	0.917	1.029	0.318
Weight or Height Percentile Category 10-90	Pre-pregnancy BMI	LGA	1.072	1.033	1.112	0.000

Association between Pre-Pregnancy BMI and categories SGA, AEG and LGA).

PO2.130

Interdisciplinary activities in the area of health promotion and prevention of childhood obesity - 30 years of experience

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Introduction: The Gdańsk Centre for Health Promotion and Addiction Prevention is a city institution that has been running interdisciplinary programmes promoting a healthy lifestyle, including obesity prevention for the residents of the city of Gdańsk, since 1992. Approximately 7,000 children aged 6-14 and their parents or guardians participate in the programmes each year.
According to WHO guidelines, health promotion and prevention activities should be interdisciplinary, combiningnumerous research areas and various forms of impact. Increasing health potential and protecting health are the basic conditions for shapinghigh quality of life and forming the main capital of human activity, therefore they were recognized as one of the top priorities of Gdańsk Development Strategies. The city tries to actively promote healthy behaviour patterns and supportpreventive actions. It is particularly important to undertake such activities for children and young people. At the executive level, anexample of population-based and effective city action is prevention and treatment of childhood obesity programme '6, 10, 14 for Health'carried out in cooperation with the University Clinical Center
Methods: Gdańsk Healthy Lifestyle Promotion Model covers population 6-14 years old. Children aged 6 are covered by "Destination: Health" programme. Interventions undertaken include: detection of disorders in posturogenesis, hearing disorders and abnormalities of visual acuity, nutritional analysis and nutrition counselling, determination of fitness level and cardiopulmonary efficiency, child development psycho-prevention guidance. Children aged 9 are covered by "Healthy Student" programme. Interventions undertaken include: body weight assessment along with body composition measurement and determination of body fat content in child's body, measurement and assessment of growth, body posture examination and evaluation, blood pressure measurement and assessment and child's physical fitness test - unique in Poland.
In case of identifying a threat of civilisation disease participants are directed to the "6-10-14" program implemented by the University Clinical Centre, where in-depth diagnostics and education ofchildren and families are carried out for the period of one year.
Results: In "Destination: Health" program annually which targets 2300 aged 6 children, during 2017-2024 period improvement in the area of overweight and obesity was observed. In 2017 11,4 % were overweight and obicity, in 2024 9,6 %, an improvement of 1,8 %. In 2017, 11,3% of children had poor and very poor cardiorespiratory fitness, in 2024 9,9%, an improvement of 1,4%. Eating behaviors requiring significant changes was in 2017 7,8 %, in 2024 4,6% an improvement of 3,2 %.
Conclusion: In the "6-10-14" program, 75% of patients included in the program reported improvement in their health results: reduction of body mass percentile (on average by 6 BMI percentiles), reduction of body fat percentage, improving circulatory and respiratory fitness and eating habits.

PO2.131

Impact of Glomerular Hyperfiltration on Progression of Chronic Kidney Disease and Hepatic Fibrosis in a Healthy Population with MASLD or MAFLD: A Long-term Cohort Study

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Objectives: This study aimed to elucidate the association between the presence of glomerular hyperfiltration (GHF) and the risk of progression of chronic kidney disease (CKD) and hepatic fibrosis in subjects with metabolic dysfunction-associated steatotic liver disease (MASLD) or metabolic dysfunction-associated fatty liver disease (MAFLD).
Methods: This study included 47,741 healthy adults who underwent health screening program at least twice at Kangbuk Samsung Hospital in Korea from January 30, 2002 to December 31, 2019. The presence of hepatic steatosis was verified by ultrasound, and NAFLD fibrosis score and FIB-4 were used to define hepatic fibrosis. the definition of CKD progression was based on the KDIGO guidelines and GHF was defined as age- and sex-specific estimated glomerular filtration rate ≥95%. Progression of hepatic fibrosis was defined as absolute increment in the fibrosis scores from the baseline.
Results: The median follow-up period was 4,893 days (3,372–5,655 days) for CKD progression and 767 days (637–1,477 days) for hepatic fibrosis progression. After adjusting for confounding factors, the presence of MASLD/MAFLD did not increase the risk of CKD progression. However, the presence of GHF increased risk for CKD progression regardless of presence of MASLD/MAFLD. For liver fibrosis progression, presence of MASLD/MAFLD significantly increased the risk of hepatic fibrosis progression. In addition, among those MASLD/MAFLD, the presence of GHF significantly increased the risk of progression of hepatic fibrosis compared to those with no GHF (HR 1.36 (95% CI 1.24–1.48) vs. 1.20 (95% CI 1.17–1.23) for MASLD and 1.37 (95% CI 1.25–1.15) vs. 1.20 (95% CI 1.17–1.23) for MAFLD, respectively.
Conclusions: In conclusion, the presence of GHF increased the risk of progression of CKD and hepatic fibrosis in healthy Korean population with MASLD/MAFLD.

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Tab. 1. Risk of hepatic fibrosis progression in patients with MASLD or MAFLD according to the presence of baseline glomerular hyperfiltration.

hyperfiltration.

Subject groups		PY	Number	Events	IR per 10000 PY	HR (95% CI)		
						Model 1	Model 2	Model 3
No hyperfitration	No MASLD	118084.48	34189	33576	2843.39	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)
	MASLD	30980.77	11152	11112	3586.74	1.05 (1.00-1.10)	1.07 (1.02-1.12)	1.08 (1.03-1.13)
Hyperfitration	No MASLD	6207.03	1886	1829	2946.66	1.30 (1.27-1.33)	1.26 (1.23-1.29)	1.20 (1.17-1.23)
	MASLD	1299.16	514	510	3925.62	1.45 (1.33-1.58)	1.42 (1.30-1.55)	1.36 (1.24-1.48)
Akaike Information Criterion						924208.42	922796.69	902578.24
Bayesian Information Criterion						924234.69	922840.48	902656.88
No hyperfitration	No MAFLD	119479.10	34664	34049	2849.79	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)
	MAFLD	29586.15	10677	10639	3595.94	1.04 (0.99-1.09)	1.07 (1.02-1.12)	1.08 (1.03-1.13)
Hyperfitration	No MAFLD	6271.58	1907	1849	2948.22	1.30 (1.27-1.33)	1.26 (1.23-1.29)	1.20 (1.17-1.23)
	MAFLD	1234.61	493	490	3968.86	1.47 (1.35-1.61)	1.44 (1.31-1.57)	1.37 (1.25-1.50)
Akaike Information Criterion						924221.65	922804.07	902590.78
Bayesian Information Criterion						924247.92	922847.86	902669.42

Model 1: no adjustment. Model 2: adjusted for age and sex. Model 3: additionally adjusted for baseline eGFR, BMI, SBP, regular exercise, and current smoking status. BMI: body mass index, CI: confidence interval, CKD: chronic kidney disease, eGFR: estimated glomerular filtration rate, HR: hazard ratio, IR: incidence rate, MAFLD: metabolic dysfunction–associated fatty liver disease, MASLD: metabolic dysfunction-associated steatotic liver disease, PY: person years, SBP: systolic blood pressure.

This is the main table

PO2.132

Maternal pre-pregnancy body mass index and biomarkers of inflammation at birth

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Introduction: Chronic low-grade inflammation induced by a high pre-pregnancy body mass index (BMI) may predispose offspring to adverse outcomes by inducing changes in fetal development. However, the association between maternal pre-pregnancy obesity and inflammatory mediators is still highly debated. Few studies have estimated fetal exposures to inflammation; the findings are not clear and often measured in very small samples of specific subgroups of women. In this study we analyzed the association between maternal pre-pregnancy BMI and biomarkers of inflammation in cord blood and maternal serum at birth in two large birth cohorts.
Methods: Maternal pre-pregnancy weight and height were used to calculate pre-pregnancy BMI (underweight [<18.5 kg/m²]; normal [18.5-24.9 kg/m²]; overweight [25.0-29.9 kg/m²]; obese [≥30 kg/m²]). Biomarkers of inflammation (interleukin [IL]-1β, IL-6, IL-10, and tumor necrosis factor α [TNF-α]) were measured from cord blood collected in both cohorts (EDEN [n=856]; ELFE [n=1016]) and maternal serum (n=1046) collected in ELFE at birth. C-reactive protein [CRP] was additionally measured in cord blood in ELFE. Linear regression models were used to determine the association between BMI categories with log-transformed biomarkers and adjusted for confounders.
Results: Pre-pregnancy obesity was strongly positively associated levels of cord blood CRP (adjusted β 0.51 [95% CI 0.31, 0.71]), while maternal underweight was associated with higher levels of cord blood IL-10 (0.20 [0.04, 0.35]) in the ELFE cohort. Pre-pregnancy BMI was not associated with any of the cord blood biomarkers in EDEN, nor was it associated with any of the maternal serum biomarkers in ELFE.
Conclusion: Pre-pregnancy obesity was strongly associated with higher levels of CRP in cord blood, suggesting that the fetus may be exposed to inflammation induced by high pre-pregnancy adiposity. These findings must be replicated in other large cohort studies. The potential impact of this inflammation should be evaluated with regards to offspring outcomes.

PO2.133

Association of bedtime regularity with incident major adverse cardiac events and all-cause mortality

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Introduction: Inconsistent sleep timing has been shown to be associated with accumulation of cardiometabolic risks and all-cause mortality (Windred et al., 2023). This study investigated whether irregular bedtime measured at midlife is associated with incident major adverse cardiac events and all-cause mortality over a 7-year follow-up period.

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Methods: In Northern Finland Birth Cohort 1966 study total physical activity and time in bed were measured by accelerometer-based activity monitor for seven consecutive days among 3694 46-year-old participants (Nordström et al., 2021). Seven-day standard deviation was used to reflect bedtime regularity (Nauha et al., 2024). Participants were followed after their activity recording until their date of hospital admittance due to major adverse cardiac events, date of death, or censoring. Gender, BMI (m^2/kg), glycated hemoglobin (mmol/mol), smoking status (current or former smoker /no smoker), and total physical activity were used as covariates in cox proportional hazards models (Hazard ratio (HR) with 95% confidence intervals (CI)). The results were calculated separately for participants whose time in bed was equal to or less than the average (≤7 hours 35 minutes) and for those whose time in bed was above the average (Krittanawong et al., 2017).
Results: Participants who spent less than the average time in bed had a higher risk of cardiac events and all-cause mortality if they were current or former smokers, compared to non-smokers (HR 3.03 95% CI 1.45–6.34, p = 0.003). Furthermore, gender differences were observed, with female gender serving as a protective factor in participants who spent less than the average time in bed (HR 0.43 (95% CI 0.20–0.95)), p = 0.036).
Conclusion: The results do not suggest that participants with more irregular bedtimes have a higher risk of incident major adverse cardiac events and all-cause mortality, whether their time in bed was below or above average. These findings underscore the importance of smoking cessation, as a potential means to mitigate health risks. Further research is needed to determine if gender differences, other aspects of sleep regularity or longer follow-up periods are significant.

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PO2.134

Hidden Obesity in Cardiac Rehabilitation Programs: Assessment Through Bioelectrical Impedance Vector Analysis

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Introduction: Hidden obesity poses a challenge to conventional body composition assessment, particularly in patients evaluated solely by Body Mass Index (BMI). This issue is especially relevant in cardiac rehabilitation patients, where precise body composition evaluation can significantly influence clinical intervention strategies.
Objective: To identify obesity phenotypes undetected by BMI but revealed through Bioelectrical Impedance Vector Analysis (BIVA) and analyze their implications in cardiac rehabilitation.
Methods: A total of 165 patients enrolled in a cardiac rehabilitation program were included in the study. Body composition was assessed using BIVA, classifying participants into four phenotypes: normal weight, false obesity (normal BMI but high fat mass), confirmed obesity (high BMI and fat mass), and hidden obesity (low BMI but high fat mass). Statistical analyses (Student's t-test, ANOVA) were performed to compare differences in metrics such as resistance (Rz), reactance (Xc), phase angle (PhA), and anthropometric measures.
Results: Participants were categorized as normal weight (28.5%), overweight (35.2%), and obese (36.4%) based on BMI. However, BIVA revealed that 12.2% exhibited hidden obesity, while 25% were classified as confirmed obesity. Hidden obesity was significantly associated with functional performance parameters ($p<0.05$), including aerobic capacity and cardiovascular metrics during ergometry. The phase angle was particularly low in the hidden obesity group, indicating compromised cellular quality and nutritional status.
Conclusion: Body composition assessment using BIVA highlights critical limitations of BMI, revealing the prevalence of hidden obesity in cardiac rehabilitation patients. These findings emphasize the need for diagnostic approaches integrating morphofunctional parameters to tailor therapeutic strategies effectively.

PO2.135

Metabolic signature of insulin resistance and risk of Alzheimer's disease

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Introduction: Substantial evidence supports the relationship between peripheral insulin resistance (IR) and the development of Alzheimer's disease (AD)-dementia. However, the mechanisms explaining these associations are only partly understood. We aimed to identify a metabolic signature of IR associated with the progression from mild cognitive impairment (MCI) to AD-dementia.
Methods: We designed a case-control study on 400 subjects living with MCI, free of type 2 diabetes, within the ACE cohort. After a median of 2.1 years follow-up, 142 subjects converted to AD-dementia. IR was assessed using the HOMA-IR. A targeted multi-platform approach profiled over 600 plasma metabolites. Elastic net penalized linear regression with 10-fold cross-validation was employed to select those metabolites associated with HOMA-IR. The prediction ability of the signature was assessed using support vector machine and performance metrics. The metabolic signature was associated with AD-dementia risk using a multivariable Cox regression model. Using counterfactual-based mediation analysis we investigated the mediation role of the metabolic signature between HOMA-IR and AD-dementia. The metabolic pathways in which the metabolites were involved were identified using MetaboAnalyst.
Results: The metabolic signature comprised 18 metabolites correlated with HOMA-IR. After adjustments by confounders, the signature was associated with increased AD-dementia risk (HR 1.234; 95%CI 1.019-1.494; $p<0.05$). The metabolic signature mediated 35% of the total effect of HOMA-IR on AD-dementia risk. Significant metabolic pathways were related to glycerophospholipid and tyrosine metabolism.
Conclusion: We have identified a blood-based metabolic signature that reflects IR and may enhance our understanding of the biological mechanisms through which IR affects AD-dementia.

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PO2.137

Social Appearance Anxiety, Orthorexia, and Body Mass Index: A Study on Health Sciences Students

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Introduction: Social appearance anxiety (SAA) refers to concerns about one's appearance [1]. Orthorexia refers to a broader concept than mere healthy eating obsession, incorporating the positive dimension of a keen interest in healthy nutrition [2]. Considering that groups working or studying in the field of health sciences may tend to orthorexia [3,4], this study aimed to evaluate orthorexia, body mass index (BMI), and SAA of university students studying in the field of health sciences.
Methods: This cross-sectional study was conducted with 370 students (116 male, 254 female), with an average age of 21.4±1.91 years studying in health sciences. Data were collected using a face-to-face questionnaire, which included general information, body weight and height, the Teruel Orthorexia Scale (TOS), and the Social Appearance Anxiety Scale (SAAS). People with a BMI less than 18.5 kg/m² or those taking psychiatric medication were excluded from the study. The TOS assesses both problematic and non-problematic beliefs and behaviors regarding healthy eating [5]. High scores on the healthy orthorexia (HO) factor indicate that the interest in healthy eating is non-pathological, while high scores on the orthorexia nervosa (ON) factor suggest a pathological interest in healthy eating [2]. The SAAS aims to assess the SAA levels of individuals [6]. Higher scores on the scale indicate greater levels of SAA [1]. The Turkish validity-reliability of the scales were confirmed [1,2]. SPSS was used for the statistical analysis, and a p-value of <0.05 was considered statistically significant.
Results: According to the World Health Organization BMI classification [7], 4.9% (n:18) of the participants were people with obesity, 19.4% (n:72) were people with overweight, and 75.7% (n:280) were people with normal body weight. SAAS scores were higher in the group with overweight and obesity (37.2±16.56) compared to the group with normal weight (31.3±13.23) (t=-3.066, p=0.003). There was no statistically significant difference between the two groups regarding the factors of the TOS. However, the HO score was higher in the group with normal body weight (11.2±4.84) than in the group with overweight and obesity (10.1±4.56). ON scores were higher in the group with overweight and obesity (5.3±4.28) compared to the group with normal body weight (4.6±3.89). A positive correlation was found between BMI and SAAS (r=0.206, p<0.001) and a negative correlation with HO (r=-0.109, p=0.036). A positive correlation was found between ON and SAAS (r=0.199, p<0.001).
Conclusion: These findings suggest that health science students' preoccupation with body image and healthy eating may contribute to increased anxiety about their appearance. Therefore, it is crucial to develop prevention and intervention strategies to address SAA and ON tendencies.

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PO2.138

The Health-of-Your-Herd: Decision Support Instruments to Monitor and Sustain an Anti-Obesogenic Childhood Environment

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Introduction: Effective and sustainable childhood obesity prevention measures require coordinated, multi-sectoral actions rather than solely increasing individual resilience to obesogenic environments. Such complex interventions are strongly dependent on stakeholder commitment, which unfortunately tends to fade over time. This project proposes data-driven solutions that integrate health data with geolocated citizen and city data, continuously updated to support inter-sectoral governance and foster sustainable, observable, and effective reshaping of childhood environments. We will explore how health economic modeling can be applied to guide the process aiming at maximum utility for all relevant stakeholders.
Methods: The research municipality (Trondheim) in this project is highly digital, owing to access to a unique national geolocated digital infrastructure and a unique Electronic Health Record (EHR). In this municipality, we will:
a) Identify relevant stakeholders by establishing local Test Beds where parents, preschool staff, and primary health care providers participate.
b) Develop composite (multi-dimensional) quality-of-life measures, consisting of personal health features including children's body mass index (BMI), group activities, social motivators, socioeconomic indicators, and indicators of the built environments including food- and physical environment. These measures will be used for clustering within geolocated groups to identify (dis)similarities, and to motivate and monitor development within and among groups.
c) Integrate a prediction model based on BMI category transition probabilities to enable health economic modeling as part of a structured early assessment of the societal value of the new technology 1). In addition, apply a qualitative methodology to explore the potential value of the solution in its intended context before final evidence on the technology's contribution is available, that is to guide project decisions towards maximum utility for stakeholders at all levels. The computational infrastructure will be piloted by the project in the initial phases, with the goal of being transferred to the municipality along with its related municipal IT services and data resources. The required machine learning can be unsupervised, incremental, and computationally inexpensive.
Results: We will present identified stakeholders and preliminary results on the capacities of the Health-of-Your-Herd instruments to monitor changes in the composite measures and next simulate long-term outcomes based on the available data sources. We will also present the process of applying health economic evaluation as part of the project, including simulation modeling capacities and considerations for upscaling to national and international levels.
Conclusion: The first preliminary evaluation of the gain and scalability capacities of the Health-of-Your-Herd instruments will be decided upon.

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PO2.139

Associations of total body fat with total and regional bone mineral density in adults: A systematic review and meta-analysis

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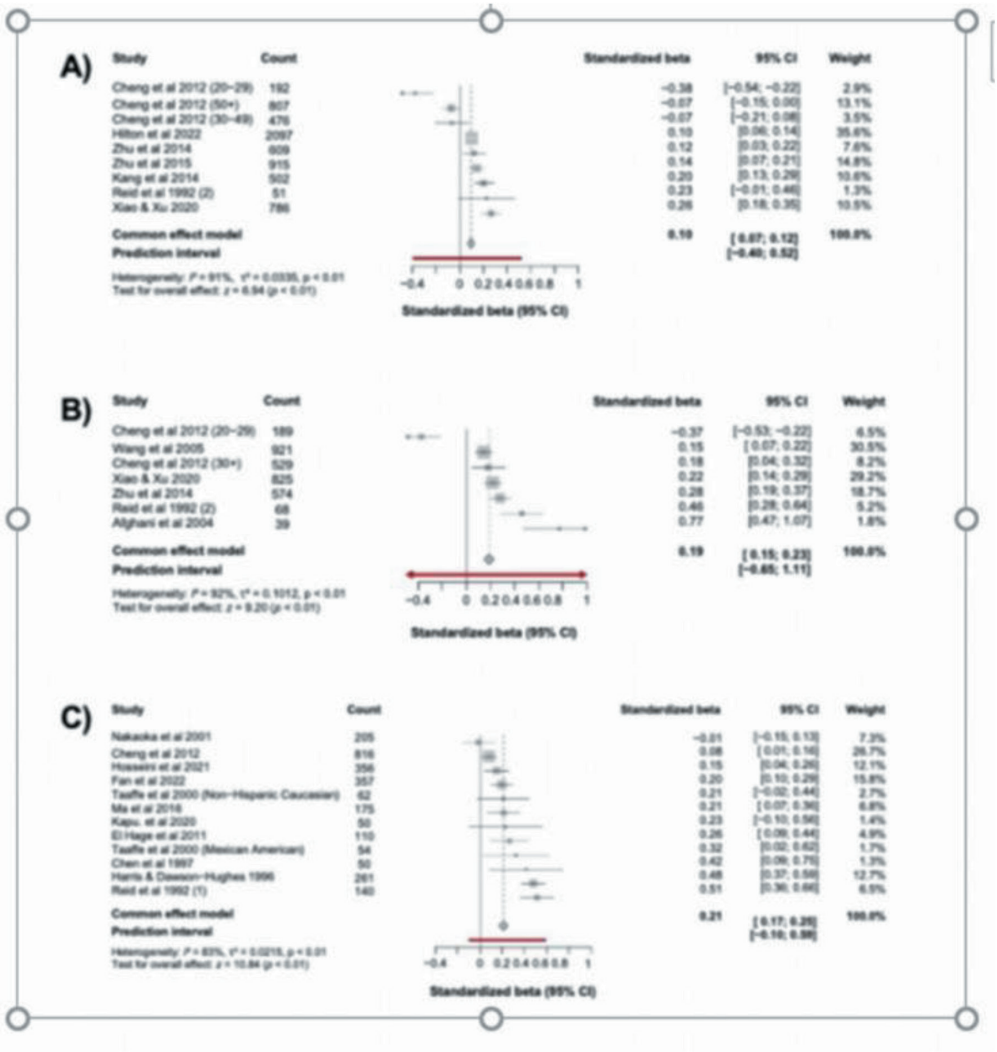
Introduction: Bone mineral density (BMD) is a critical determinant of osteoporosis risk and adiposity has been implicated as a potential modifiable factor. The aim of this systematic review and meta-analysis is to evaluate the association of total body fat with total, lumbar spine, and femoral neck BMD in studies that utilized dual-energy X-ray absorptiometry (DXA), and to examine the impacts of lean mass and ethnicity on these associations.

Methods: A systematic search of literature identified 20 cross-sectional studies assessing DXA-derived total body fat and BMD of the whole-body total, lumbar spine and/or femoral neck. Standardized pooled regression coefficients were calculated using fixed effects models to quantify associations for men, premenopausal women and postmenopausal women. Sensitivity analyses were performed to examine the effect of accounting for lean mass and subgroup analyses were stratified based on ethnicity (European descent vs. Asian populations).

Results: Total body fat was positively associated with total, lumbar spine and femoral neck BMD across men, premenopausal women, and postmenopausal women. The associations were strongest in postmenopausal women (e.g., total BMD: sβ = 0.21 [95% CI: 0.17, 0.25]) and premenopausal women (0.19 [0.15, 0.23]) compared to men (0.10 [0.07, 0.12]). The exclusion of studies that did not adjust for total lean mass did not significantly alter theses associations. Populations of European descent demonstrated stronger associations (e.g., associations of total BMD in postmenopausal women: 0.42 [0.30, 0.54]) compared to Asian populations (0.12 [0.07, 0.17]).

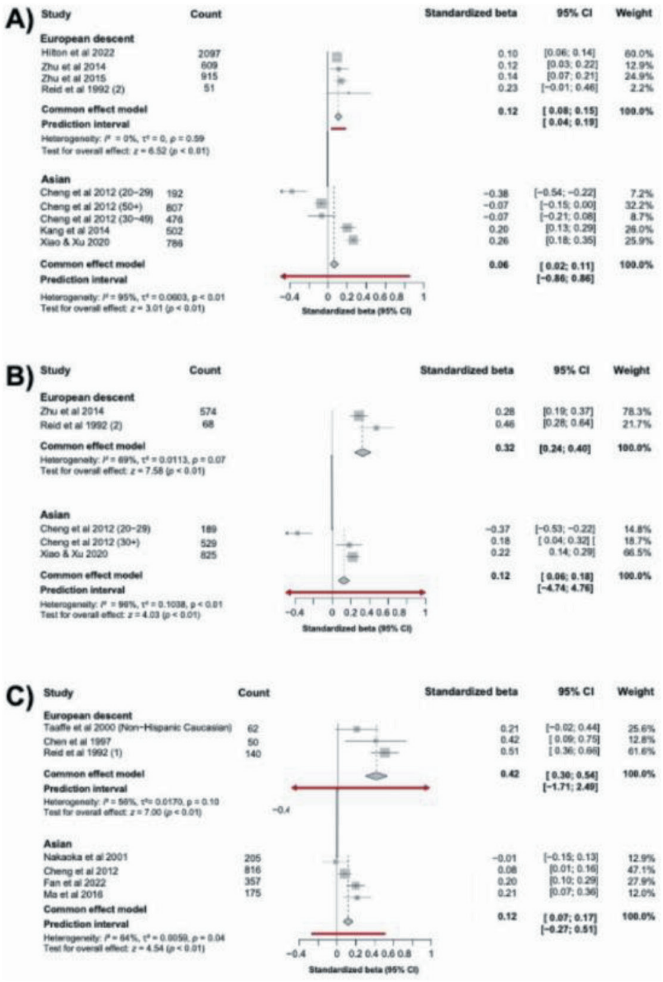
Conclusion: Total body fat is positively associated with BMD, most strongly in postmenopausal women and populations of European descent. The findings of this review highlight the need for longitudinal studies to confirm causality and preventative public health strategies that are tailored to address individual risks of osteoporosis and fractures.

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This figure shows the overall associations from the the meta-analysis of total body fat with bone mineral density across three subgroups- men, premenopausal women and postmenopausal women.

Fig. 1. Association of total body fat and total BMD in (A) men, (B) premenopausal women and (C) postmenopausal women using fixed effects model.



This figure shows the associations of total body fat with total bone mineral density across sex-specific groups, comparing associations from studies of European with Asian ancestry. Associations in studies of European ancestry demonstrated stronger associations than those from Asian populations.

Fig. 2. Association of total body fat and total BMD in (A) men, (B) premenopausal women and (C) postmenopausal women by ethnic groups (Asian, African, European-descent, Other) in studies that adjusted for lean mass.

PO2.140

The Effect of Emotional Eating and Nutritional Status on Defecation Habits in Adult Women

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Introduction: Emotional eating refers to the tendency to eat in response to certain emotional states. In studies, it has been determined that emotional eating is more common in women than in men. Moreover, studies on adult individuals have proved the important effect of psychological factors on bowel movements and defecation habits. In this study, it is aimed to examine the effect of emotional eating status and nutritional status habits on the defecation habits of adult female individuals who applied to a private clinic in Istanbul and voluntarily participated in the study.

Methods: The study was conducted between July-September 2023 with 150 women with non-pregnant and non-lactating between the ages of 18-65 who were not diagnosed with depression. In the questionnaire form, demographic characteristics, anthropometric measurements, physical activity level, nutrition and defecation habits, 3-day food consumption record were taken. The questionnaire was conducted on an online platform and 3-day food consumption records were obtained by telephone interview. The Emotional Eating Scale - Adult Form (EES) was used to examine the emotional eating status of the participants and the Bristol Stool Form Scale (BSFS) and Rome III Criteria Scale were used to examine the defecation habits.

Results: The mean age of the participants was 36 ± 11.04 years and mean BMI was 25.05 ± 4.77 kg/m² and most of the participants were classified as slightly participants with overweight (6.7% participant with underweight, 47.3% participant with normal weight, 29.3% participants with overweight, 17.7% participant with obesity). The defecation frequency of individuals with normal BMI classification was found to be higher than that of individuals in other BMI groups (p=0.018). The presence of any condition that makes defecation difficult and the intake of emollient medication to facilitate defecation were significantly higher in individuals with obesity compared to other individuals (p=0.001, p=0.019). In addition, a statistically significant relationship was found between BMI values in obese classification and emotional eating tendency (p<0.05). A significant difference was found between emotional eating and the frequency of defecation problems according to the subscale scores of the EES and Rome III Criteria (p<0.05).

Conclusion: In conclusion, it was found that high BMI value of individuals negatively affected both defecation habits and emotional eating status. In addition, significant differences were found between emotional eating scores and the frequency of defecation problems of individuals. Therefore, decreasing BMI values of individuals and decreasing emotional eating symptoms may have positive effects on defecation habits.

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Tab.1. Comparison According to Emotional Eating Scale Scores from Rome III Criteria Scale and Emotional Eating Scale Subscales.

Rome III Criteria		Emotional Eating Scale	
		Mean±SD	p
Straining	Yes	2.72 ± 0.71	0.001*
	No	2.29 ± 0.7	
Lumpy or hard stools	Yes	2.6 ± 0.73	0.178
	No	2.4 ± 0.73	
Sensation of incomplete evacuation	Yes	2.65 ± 0.72	0.008*
	No	2.32 ± 0.71	
Sensation of anorectal obstruction	Yes	2.72 ± 0.7	0.035*
	No	2.44 ± 0.74	
Manual manoeuvres to faciliate	Yes	2.89 ± 0.76	0.009*
	No	2.44 ± 0.71	
Fewer than 3 defecations per week	Yes	2.78 ± 0.8	0.047*
	No	2.45 ± 0.71	

Mann–Whitney U test

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PO2.141

Weight Stigma Across Borders: Ethnographic Evidence from Turkey and the UK

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Introduction: Overweight and obesity rates in Turkey and in the United Kingdom is high and weight bias is common. This study aims to compare the practices of weight-related stigmatization and discrimination in both countries.
Methods: This study is based on ethnographic methodology. In-depth interviews were carried out with 75 participants in total, including 42 from Turkey and 33 from the United Kingdom. Participants shared their attitudes toward obesity, as well as their experiences with weight-related prejudice and stigma, across themes such as education, work life, access to healthcare, social life, media representations, and general perceptions.
Results: Participants in Turkey face more overt stigma compared to those in the United Kingdom, encountering greater challenges in accessing healthcare services and navigating social life. In contrast, stigma related to weight in the UK is more subtle but manifests more prominently in education and professional settings, where weight bias tends to be comparatively higher.
Conclusion: This study highlights the complex and diverse nature of attitudes toward obesity across cultures. Understanding these cultural differences is crucial for developing effective, culturally sensitive strategies to address weight stigma. By shedding light on these disparities, the research paves the way for further studies and interventions tailored to specific cultural contexts.

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PO2.143

Obesity and overweight in elderly people receiving outpatient care in Northern Brazil

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Introduction: Obesity is a multifactorial condition that affects millions of people worldwide and is associated with a series of chronic diseases. These conditions, when not treated properly, can significantly compromise the quality of life of individuals, especially among the elderly population.
Objective: To characterize the age and degrees of obesity among elderly people in Northern Brazil.
Methods: This is a quantitative, descriptive, observational, and cross-sectional study using a convenience sample, with 75 elderly people of both sexes, assisted at an outpatient clinic in the city of Manaus-Amazonas, from January to September 2024. The following instruments were used: the elderly person's health booklet and clinical assessment instruments, BMI and degrees of obesity were used to classify the elderly.
Results: The average age of the individuals is 69.6 (5.3) years, with a predominance of females, representing 64.29% (54). Regarding literacy, most participants can read and write, covering 85.71% (72). The overweight category, representing 50.63% (40). Next, obesity grade I is the second most prevalent, corresponding to 35.44% (28). Cases of obesity grade II and obesity grade III had lower frequencies, with 5.06% (4) and 3.80% (3). An analysis of the associations between age in those over and under 70 years old, obesity and sex revealed that there were no statistically significant results found in any of the categories evaluated.
Final considerations: Obesity, especially overweight and obesity grade I, was highly prevalent in the elderly population, highlighting the importance of preventive interventions for this age group. No significant associations were observed between age, sex and degrees of obesity.

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PO2.144

Socioeconomic variation of body mass index among the population in Ireland

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Introduction: As the prevalence of obesity continues increasing globally, significant variation in obesity prevalence by age and socioeconomic status (SES) persists. Similar to many other countries, Ireland continues to struggle with the current obesity epidemic. Ireland's Obesity Policy and Action Plan is a key initiative to reduce obesity prevalence. This study aimed to quantify and update the prevalence of obesity by age and SES and examine the level of inequality in the prevalence of obesity in Ireland.
Methods: We used cross-sectional bi-annual data from the nationally representative population-based Healthy Ireland survey for 2015–2022 (n=23,296). Height, weight, educational attainment, age and sex were self-reported and data weighted to represent the Irish population in each year. Following the World Health Organization recommendation for population surveillance, body mass index (BMI) was categorised into: underweight [BMI <18.5 kg/m2], normal weight [BMI 18.5-24.9 kg/m2], overweight [BMI 25.0-29.9 kg/m2], and obese [BMI ≥30.0 kg/m2]. Highest educational attainment was used to define SES. Socioeconomic differences and changes in inequality over the survey period were identified using the relative index of inequality (RII). Multinomial logistic regression was used to analyse the association between SES and BMI groups with adjustment for sex, age, and survey year, combined over the survey period.
Results: Obesity prevalence ranged from 22.6% to 21.6% in 2022. The combined data estimates indicated obesity prevalence was highest among the least educated (33.5%; relative risk (RR)=2.8; 95% confidence interval (CI)=2.4, 3.4) compared to most educated (14.7%). Additionally, obesity was highest in individuals aged 60-69 years (31.3%, RR=6.5; 95% CI=5.7, 7.5), compared to those aged <30 years (10.4%). Relative inequalities among individuals classified as obese continued to increase significantly over the survey period, among the least educated population (RII=2.2; 95% CI=1.9,2.5; p<0.01).
Conclusion: This study examined SES variation in obesity prevalence in the Irish population using recent data. Obesity remains high, with more than one in five adults classified as obese throughout 2015 to 2022. Significant differences in obesity prevalence by SES and age were seen during the survey period. Additionally, the socioeconomic inequalities continued to widen among the population living with obesity in Ireland. This highlights the urgent need for resources aimed at lower SES groups in developing equity-focused obesity prevention and management programs in Ireland, highlighting the potential health system challenges and rising health costs associated with these disparities. Additionally, the results from this study could help inform future health economic evaluations of obesity interventions to consider different impacts of obesity across different population sub-groups.

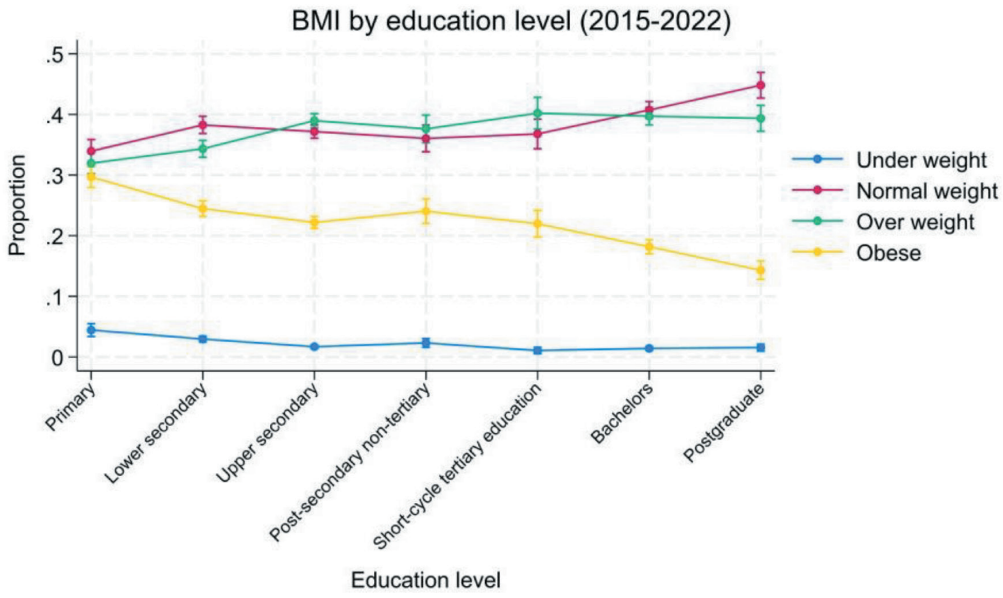


Fig. 1. Body mass index (BMI) by educational level.

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PO2.145

The complex relationship between body mass index and medication adherence in chronically ill patients

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Introduction: Non-adherence to medical recommendations is a significant issue in treating patients with chronic illnesses. It stems from various causes, including psychological factors. At the same time, individuals with excessive body weight are often attributed to certain psychological traits, such as a lack of self-discipline, which may influence non-adherence to recommendations. Therefore, this study aimed to evaluate the relationship between body mass index (BMI) and adherence to medical recommendations in a group of chronically ill individuals.
Methods: The study involved 768 adult participants (57.11 ± 15.77 years old) with medical recommendations based on chronic disease diagnoses (cardiological - 24%, oncological - 22%, metabolic - 29%, musculoskeletal - 24%, neurological - 1%). The majority were women (67.7%), urban residents (81.25%), in relationships (62.63%), and having children (80.73%). Basic or vocational education was reported by 26.56% of respondents, secondary education by 41.54%, and higher education by 31.9%. In addition to a survey on sociodemographic data, the MAQ-4 was used to assess adherence to medical recommendations.
Results: Both the contingency coefficient (C=0.12, p=0.002) and regression analysis results (R2=0.009; p=0.009) indicated a significant but weak positive correlation between BMI and MAQ. Participants were divided into two subgroups based on BMI values (A <30 BMI, 561 individuals; B >30 BMI, 207 individuals). The groups did not differ significantly in terms of age (p=0.54), relationship status (p=0.39), or occupational status (p=0.31). Most respondents from Group A (73.8%) and Group B (65.2%) did not adhere to medical recommendations. The total ranks for MAQ scores were significantly higher in group A (U=50367.0, p<0.004), but the difference in mean MAQ scores was significantly in favor of group B (chi2=5.055, p=0.025).
Conclusion: Although among chronically ill individuals with a lower BMI, there are more people with a high level of adherence to medical recommendations, in general, individuals with obesity are more adherent. These findings contradict the negative stereotype often attributed to this group of patients and may be important from the perspective of counteracting the stigmatization of individuals with obesity.

PO2.146

Association Between the Educational Environment and Eating Behaviors Among College Students From Economically Disadvantaged Regions: The 24h-MESYN Study

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Aim: To investigate the association between the educational environment and eating behaviors in economically disadvantaged regions.
Methods: We conducted this research using baseline data from the 24-hour Movement Behavior and Metabolic Syndrome (24h-MESYN) study, a multicenter cohort study. Our sample included 386 college students from two Brazilian cities (Gini indices ≤0.56), of whom 67.7% were female, 63.9% were under 20 years old, 72.5% identified as non-white, and 84.1% reported a monthly household income below USD 260.15. All data were self-reported via an online questionnaire administered in person and previously validated for this population. The educational environment, the main exposure, was assessed using an adapted 50-item Dundee Ready Education Environment Measure (DREEM) questionnaire, divided into five domains (perceptions of learning, teachers, academic self-perceptions, atmosphere, and social self-perceptions). The psychometric properties showed strong internal consistency (α > 0.90), acceptable structural coefficients (RMSEA = 0.055), and convergent validity with the Brief Symptom Inventory (BSI-18, ρ = -0.32). Eating behaviors, the outcomes, were assessed using the 33-item Dutch Eating Behavior Questionnaire (α ≥ 0.91, RMSEA = 0.076), which evaluates emotional, restrained, and external eating. Potential confounders included sex, age, race/ethnicity, city, maternal education, employment status, academic program, shift, and 24-hour movement behaviors (physical activity, sedentary behavior, and sleep). We analyzed the associations using multilevel linear regression with random effects, considering the research center as a contextual variable. To retain variables in our multivariate model, we set a significance level of p ≤ 0.20.
Results: We observed an educational environment score of 118.06 ± 14.49, and mean scores of 1.53 ± 0.91 for emotional eating, 2.03 ± 0.58 for external eating, and 1.32 ± 0.88 for restrained eating. In adjusted models, only emotional eating was significantly associated with the educational environment (β = -0.02, 95% CI: -0.02 to -0.01), indicating that a better perception of the educational environment was linked to decreased emotional eating. Neither external eating (β = -0.01, 95% CI: -0.01 to 0.01) nor restrained eating (β = -0.04, 95% CI: -0.10 to 0.02) showed significant associations.
Conclusion: Our findings highlight the role of the educational environment in shaping eating behaviors among college students from economically disadvantaged regions and underscores the need to consider college environment as a potential trigger for obesity through emotional eating.

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Dietary consumption patterns among elderly individuals according to sex and regions of Brazil

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Introduction: Dietary patterns are directly associated with the prevalence of chronic diseases, such as obesity, diabetes, and hypertension. In Brazil, regional disparities in dietary habits reflect different socioeconomic and cultural contexts, making detailed analysis of these patterns in different regions essential.
Objective:
To characterize the consumption habits of sweets, excess salt, soft drinks, vegetables, fruits, and beans in different regions of Brazil, evaluating differences by sex and considering variations in prevalence and confidence intervals (CI).
Methods: The data used came from the 2013 National Health Survey (PNS), with analyses segmented by region (North, Northeast, Southeast, South, Central-West) and by sex (male and female). Prevalence rates were accompanied by CI and coefficient of variation (CV).
Results: The results revealed significant differences in food consumption between men and women. For sweets, consumption was higher among

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men in the Midwest (26.6%) and lower among women in the North (6.4%). In salt consumption, men in the Midwest led (14.4%), while among women, the highest consumption was observed in the South (6.7%). In the case of soft drinks, men in the Midwest had the highest consumption (19%), and women in the Northeast recorded the lowest (5.6%). Regarding vegetables and fruits, women in the Midwest stood out with the highest consumption (48.7%), while men in the Northeast had the lowest (23.4%). Finally, for bean consumption, men in the Midwest led (82.8%), while the lowest consumption was recorded among women in the North (42.3%).

Final considerations: The results demonstrate significant differences in dietary patterns between the regions of Brazil and between the sexes. The consumption of sweets, salt, soft drinks, vegetables, fruits and beans varies widely, with men generally having higher prevalence, especially in the Central-West, where they led consumption in several categories. Among women, the highest consumption of healthy foods, such as vegetables and fruits, was observed in the Central-West, while the lowest consumption of healthy items, such as beans, was recorded in the North. The need for targeted public policies to promote healthy eating is highlighted.

PO2.148

Nutritional status of institutionalized elderly people: Comparison between Body Mass Index and Calf Circumference

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Introduction: Senescence is the natural process of human aging, with numerous changes occurring: morphological, physiological, and biochemical [1]. Nutritional status is essential for monitoring the individual's clinical condition, especially in elderly people, although numerous factors make nutritional assessment difficult in this life cycle [2]. This research aimed to analyze the nutritional status of institutionalized elderly people and compare methods and gender.

Methods: This is a cross-sectional, descriptive study carried out with 44 elderly people (≥ 60 years old) of both sexes, living in a long-term care institution located in the northeast region of Brazil. Data were collected in 2024 using anthropometric data from the Elderly Health Record (CSPI) that include weight, height, body mass index (BMI), and calf circumference (CC). The CSPI cutoff points for BMI and PP were used. BMI was classified as: underweight (BMI <22 kg/m2), adequate weight (BMI ≥22 and <27 kg/m2) and overweight (BMI ≥27 kg/m2); and PP was classified as ≥ 31 cm as adequate and <31 cm as indicative of reduced muscle mass.

Results: The mean age of the participants was 74.86 years (±9.84), with a predominance of females (59.1%) and people of mixed race (79.5%). Regarding BMI, most men had adequate weight (52.9%), although, according to PP, they showed signs of reduced muscle mass (82.4%). Among women, a predominance of overweight was observed (42.3%), but a predominance of signs of reduced muscle mass was also identified (92.6%). No statistical difference was identified between the sexes for BMI (p=0.221) or PP (p=0.297).

Conclusion: It was observed that, although nutritional status by BMI demonstrated the predominance of adequate weight and overweight, when PP was evaluated, institutionalized elderly people showed signs of reduced muscle mass, evidencing the fragility of the isolated use of BMI to assess the nutritional status of this population.

PO2.149

Impact of hybrid artificial pancreas and nutritional education on a patient undergoing pancreatectomy for pancreatic adenocarcinoma

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Background: The Hybrid Closed-Loop System (HCLS), leveraging real-time continuous glucose monitoring (CGM) to adjust insulin delivery, represent a breakthrough in type 1 diabetes. However, clinical guidelines still recommend nutritional and carbohydrate counting education to optimize glycemic control and insulin dosage, even though this is not yet standard practice in all diabetes clinics. When using HCLS, Nutritional Education (NE) provides essential data: by entering the precise amount of carbohydrates to be consumed, the system can calculate and deliver the most appropriate insulin dose.

The objective of this case report is to illustrate how the incorporation of HCLS and optimized NE has markedly enhanced glycemic control in an individual who underwent pancreatectomy for pancreatic adenocarcinoma with a BMI of 26. The patient showed substantial postoperative muscle mass loss which contributed to a significant decrease in insulin sensitivity, thereby exacerbating the challenge of achieving optimal glycemic compensation.

Methods: A 67-year-old female, who underwent pancreatectomy for pancreatic adenocarcinoma, presented with severe glycemic instability, including frequent severe hypoglycemia and hyperglycemic peaks that were uncontrolled with conventional insulin therapy. Six months after surgery, a HCLS was implemented. Anthropometric and biochemical parameters, including FM, FFM and SMM, HbA1c, frequency of hypoglycemia and Time In Range (TIR) were assessed before and after HCLS implantation and after the NE program.

The NE course was conducted in two meetings: in the first one, the patient learned to identify carbohydrate-containing foods and to quantify the exact amount of carbohydrates in various meals; in the subsequent meeting, the patient learned how to calculate and modify their insulin-to-carbohydrate ratio (ICR), insulin sensitivity factor (ISF), and how to better correct hypoglycemia and hyperglycemia.

Results: The NE program improved the patient's capacity to recognize and estimate macronutrients, calculate carbohydrates, optimize insulin delivery timing, and manage hypo- and hyperglycemia, including complex meals. The intervention also promoted a heightened awareness of dietary choices and physical activity, which lightly improved body composition and thus the patient's overall quality of life. The combined HCLS and NE intervention resulted in significant improvements in glycemic control, as evidenced by increased TIR, reduced HbA1c, and fewer hypo- and hyperglycemic events. In addition, the patient exhibited an improved lipid profile and body composition. (Table 1)

Conclusions: The utilization of a HCLS has been demonstrated to be an exceptionally effective instrument in enhancing glycemic control and metabolic outcomes. NE programs provide the patient with the necessary skills to further improve glycemic and metabolic control as well as the quality of life. This case-report highlights the importance of combining advanced diabetes technologies with personalized education in complex clinical scenarios, underscoring the necessity for multidisciplinary and individualized approaches in patients with complex conditions.

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Tab. 1. Patient reference parameters.

Parameters	Before HCLS	After HCLS	After NE program
Age	60	60	60
Renal failure	Yes	Yes	Yes
Origin	European	European	European
HbA1c (%)	7.2	6.8	6.4
BMI	26.2	26.5	25.8
FFM (%)	55.7	56.2	59.8
FM (%)	44.3	43.8	40.2
SMM (%)	22.8	22.9	23.7
Total Cholesterol (mg/dL)	220	200	190
HDL (mg/dL)	45	50	55
Tryglycerides (mg/dL)	180	133	110
TSH (mIU/L)	2.5	1.7	2.9
FT3 (pg/mL)	3.1	3.7	3.4
FT4 (ng/dL)	1.2	1.5	1.8
AST (U/L)	25	27	23
ALT (U/L)	30	17	34
GGT (U/L)	35	25	31
Microalbuminuria (mg/dL)	25	21	23
Coefficient of variation (%)	38.3	33.1	32.4
Frequency of hypoglycemia (episodes per month)	10	2	1
Time In Range (70-180 mg/dL) (%)	50	70	80
Time of Blood Glucose < 70 mg/dL (%)	15	5	2
Time of Blood Glucose < 54 mg/dL (%)	5	1	0.5
Time of Blood Glucose > 180 mg/dL (%)	30	24	17

The following table presents the values of various anthropometric (BMI, FFM, FM, SMM), biochemical, and glycemic control parameters in a 60-year-old female patient with type 1 diabetes following a pancreatectomy. The values are reported at three distinct time points: before HCLS implantation, after HCLS implantation, and after completion of a nutritional education (NE) program. This table facilitates the evaluation of the impact of both HCLS and the NE program on the various parameters analyzed.

PO2.150

Calf Circumference Adjusted by BMI as an Indicator of Muscle Mass Loss in Overweight Older Adults

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Introduction: Aging leads to changes in body composition, particularly in fat and muscle mass, making older adults more susceptible to adverse health outcomes, which may be exacerbated by vulnerability. Calf circumference (CC) is a reliable indicator for assessing muscle mass (MM) loss. Adjusting CC by body mass index (BMI) reduces the influence of body composition on CC evaluation. Thus, this study aimed to assess the association between vulnerability and BMI-adjusted calf circumference in overweight older adults.

Methods: This was a cross-sectional study conducted in long-term care facilities for older adults in the Northeast region of Brazil. Data were collected on sociodemographic profiles, nutritional status (weight, height, and CC), and the Vulnerable Elders Survey-13 (VES-13) from the Brazilian Older Adults' Health Handbook (Caderneta de Saúde da Pessoa Idosa). Older adults aged ≥ 60 years with a BMI ≥ 27 kg/m² were included in the study. For CC adjustment by BMI, the following values were considered: for BMI 30–39.9 kg/m², 7 cm was subtracted for both men and women; for BMI ≥ 40 kg/m², 12 cm and 11 cm were subtracted for men and women, respectively (1). CC values < 34 cm for men and < 33 cm for women were classified as indicative of reduced MM, based on Brazilian cut-off points (2). A bivariate analysis was performed to assess the association between independent variables and CC, using Pearson's chi-square test.

Results: Among the 67 older adults evaluated, most were female (73.1%) and aged between 75 and 84 years (40.3%). The mean BMI was 31.3 ± 4.1 kg/m², and the mean BMI-adjusted CC was 29.1 ± 3.8 cm. A high prevalence of individuals with indicative MM loss (88.1%) was observed, particularly among women (65.7%) and vulnerable older adults (88.1%). Vulnerability (77.6%), disability (76.1%), and physical limitation (65.7%) were more frequent in individuals with indicative MM loss. However, no significant associations were found between BMI-adjusted CC and the domains of the VES-13.

Conclusion: This study observed that, despite being overweight or obese, older adults can also present with MM loss. Although no significant association was found with vulnerability, MM loss was more common among individuals with functional decline. These findings highlight the need for healthcare services to focus on preventing MM loss and maintaining functionality in older adults.

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PO2.151

Sugar and sweetener consumption among adults and 11-18 year old youngs in Hungary

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Introduction: 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.
Material-Method: 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%).
Conclusion: Family doctors and health professionals have a major role to play in education, including the reduction of anomalies in sugar and sweetener consumption habits, which are associated with obesity.

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PO2.152

Patterns of weight loss injection use and barriers to access in Australia

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Introduction: Obesity affects over one-third of Australians and is the primary contributor to disease burden. GLP-1 medications like semaglutide and dulaglutide have proven highly effective for weight loss and cardiovascular risk reduction, especially when combined with lifestyle changes. However, global supply shortages have limited their availability in Australia, creating access barriers for those with obesity. The medications are expensive with limited government subsidisation for individuals who do not have diabetes, with access generally restricted to costly private prescriptions. This has raised concerns about equity, and most importantly, provision of lifestyle and psychological support while taking the medications which can lead to sustained benefits once the drug has been ceased. This research explores GLP-1 medication use in Australia, focusing on usage barriers, and support systems to develop strategies for safe, appropriate usage and improved access for individuals with obesity who do not have diabetes.
Methods: An online survey was developed using published research and the expertise of the research team which included an endocrinologist, dietician, and an epidemiologist with expertise in obesity. The survey investigated patterns of GLP-1 usage in Australia, barriers people might experience trying to access these medications, and the support provided to those using GLP-1 medications in Australia. The survey was used to collect a convenience sample of participants via social media advertising using Facebook. Eligibility included living in Australia and aged over 18 years old.
Results: N = 422 individuals took part in the survey, of whom 88.2% were female with only 43.8% reporting they considered themselves to be very overweight. 84.3% said they had not been diagnosed with diabetes though only 14.0% said they had difficulty in accessing the medications with 78.7% reporting they accessed the medications via their GP or a medical specialist. Of those reporting taking a GLP-1 medication (n = 306), 56.1% said they were not affordable. 33.6% did not feel supported enough in general with 60.8% not given any dietary support, 67.69% not given any physical activity support and 73.6% receiving no psychological support.
Conclusion: While individuals taking part in this survey reported being able to access GLP-1 medications via their GP or medical specialists, affordability was an issue as these medications were not subsidised by the Australian government at the time of the research. Significantly, only a small proportion of individuals reported receiving lifestyle or psychological support while taking these medications indicating that there is unlikely to be sustained benefits once the drug has been ceased. There needs to be greater provision of support to ensure the significant expense of taking these drugs is justified long term.

PO2.153

"Quality of life and body composition as a function of physical activity and adherence to the Mediterranean diet"

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Introduction: Obesity is associated with a significant decline in quality of life, affecting physical and mental health. Factors such as physical activity and healthy eating can make a significant difference both in health and in improving body composition. Regular physical activity is associated with reduced body fat, increased muscle mass, improved mobility and psychological well-being. In turn, adherence to the Mediterranean Diet demonstrates benefits in the prevention of various diseases, as well as in the improvement of general health and quality of life, thanks to the composition of the foods that comprise it. This study aims to explore the relationships between health-related quality of life, body composition, physical activity and adherence to the Mediterranean diet in a sample of adults.
Methods: This is a correlational, cross-sectional and descriptive desing carried out with 58 adults (67.2% women) seen in a nutrition clinic. The mean age of the participants was 47.3 years (±9.8). The tools used were the IPAQ questionnaire to measure physical activity (in METs), the SF-36 to assess health-related quality of life, and the MEDAS questionnaire for adherence to the Mediterranean diet. Body composition was assessed by ISAK anthropometry and electrical bioimpedance (Tanita® BC-418MA). Statistical analysis was performed using SPSS software.

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Results: Descriptive analysis showed a mean percentage of fat mass of 28.9% (±10.5), while the mean waist-to-height ratio (WtHR) was 0.58 (±0.10). Mean physical quality of life was 55.9 (±18.7), and mean mental quality of life was 51.7 (±17.6). Mean physical activity level was 3,087 METs (±3,605), and mean adherence to the Mediterranean diet was 6 points (±3). A significant correlation was found between increased physical activity and physical quality of life ($r = 0.42$, $p < 0.01$). In addition, greater adherence to the Mediterranean diet was significantly associated with lower WtHR values ($r = -0.35$, $p < 0.05$).

Conclusions: Regular physical activity and adherence to the Mediterranean diet are related to better quality of life and healthier body composition. These findings highlight the importance of promoting active lifestyles and increased adherence to the Mediterranean diet to improve quality of life, general health and perceived well-being.

PO2.154

Understanding Overweight and Obesity in Adolescents and Young Adults: From Health Challenges to Social Media Influence

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Introduction: The prevalence of overweight and obesity continues to rise, despite ongoing efforts by health professionals to promote healthy habits. Late adolescence and early adulthood are critical periods for weight accumulation, making it essential to encourage self-care from an early age to prevent obesity and its associated complications. However, physical stereotypes among young people are becoming increasingly unrealistic, and excessive concern about physical appearance can have harmful consequences. Given these dynamics, this study aimed to investigate body weight management, perceptions of physique, and healthy habits in a representative sample of emerging adults in Spain.

Methods: A total of 1,000 young individuals aged 16 to 30 years, representative of the Spanish population, participated in a telephone survey conducted in 2020. The survey collected information on body perception, healthy habits, and self-reported anthropometric data.

Results: Among the participants, 24.6% self-reported living with overweight or obesity, and one-third had at least one parent with excess weight. Two-thirds of participants reported having received nutrition education at school. However, 55.2% of the total population expressed a desire to be thinner, including 13.9% of individuals with an insufficient BMI who still wanted to lose weight. Notably, 88% of young people with excess weight reported experiencing self-consciousness or rejection due to their weight. The main causes attributed to excess weight were lack of exercise (33.8%), anxiety (29.6%), and poor diet (20.7%). Weight loss attempts were common, with 70.6% of the total population having tried to lose weight, rising to 90.3% among those living with overweight or obesity. Weight management strategies among participants with excess adiposity included diets (50.1%) and the use of non-pharmacological weight loss products (63.9%). Social networks were widely used for nutrition-related topics, with Instagram (44.4%) and YouTube (41.1%) being the most frequently consulted platforms. Interestingly, individuals with a higher-than-normal BMI were less likely to use social networks compared to the general population.

Conclusions: Not all young individuals aged 16 to 30 reported having received formal nutrition education, which may contribute to ineffective weight management practices. The widespread desire to lose weight highlight societal pressures on body image, with anxiety emerging as a notable factor associated with excess weight. The reliance on non-pharmacological weight loss products and social media platforms as key influences on weight management strategies is concerning, underscoring the need for improved education and evidence-based interventions that address both physical and mental health in this population.

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PO2.155

Weight stigma and beliefs about the causes of obesity in Brazilian Healthcare Professionals

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Introduction: People living with obesity (PLWO) experience weight stigma in healthcare, leading to inequitable care. Research highlights that healthcare professionals (HCP) hold stigmatizing attitudes and beliefs; however, there is a lack of research examining weight stigma in Brazilian HCP. This study aimed to explore weight stigma and obesity-related beliefs among Brazilian HCP.

Methods: A total of 507 HCP (394 women, 78.5%; mean age = 37.6 years, SD = 12.3 years; mean BMI = 27.7 kg/m², SD = 6.5 kg/m²) participated in the study. The sample comprised dietitians (131, 26.1%), physicians (84, 16.8%), psychologists (61, 12.2%), nursing professionals (61, 12.2%), complementary HCP (68, 13.6%), and others (96, 19.1%), with 298 (59.6%) reporting that they provide care for PLWO. Participants were recruited online and answered questions assessing attitudes, beliefs, and knowledge about obesity, adapted from a previous study[1]. Weight stigma was assessed using the Brazilian version of the Fat Phobia Scale (FPS)[2]. Linear regression models were used to evaluate the association of participants background characteristics on weight stigma. Regression coefficients and 95% confidence intervals were calculated, with statistical significance set at $p < .05$.

Results: Female HCP ($B = -0.22$, $p = .007$) and HCPs who care for PLWO ($B = -0.16$, $p = .009$) reported significantly lower FPS scores. Dietitians, psychologists, and HCPs in the "other" category showed significantly lower FPS scores compared to physicians (dietitians: $B = -0.49$, $p < .001$; psychologists: $B = -0.30$, $p = .011$; others: $B = -0.33$, $p = .002$). Beliefs about overeating, such as "malfunctioning physiological mechanisms" and "food environment," were associated with lower FPS scores compared to "emotional/comfort eating" (overeating due to malfunction: $B = -0.22$, $p = .004$; food environment: $B = -0.21$, $p = .020$). Attributing weight loss difficulty to "genetic/metabolic factors" was also linked to lower FPS scores ($B = -0.34$, $p < .001$) compared to "individual lack of motivation/self-discipline". Beliefs about "factors beyond patient control" in weight loss interventions, including "inadequate care by HCP" and "biological mechanisms" were significantly associated with lower FPS scores compared to "lack of motivation/self-discipline" (external factors: $B = -0.34$, $p = .001$; inadequate care by HCP: $B = -0.28$, $p = .018$; biological mechanisms: $B = -0.32$, $p = .007$).

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Conclusion: Higher weight stigma is observed among males, physicians, HCP who do not care for PLWO and HCP attributing obesity to individual factors like lack of motivation or self-discipline. Findings highlight the importance of addressing weight stigma in Brazilian HCP to improve care for PLWO.

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2. de Souza, G. C. A., et al. Fat phobia scale-short form and beliefs about obese persons scale: cross-cultural adaptation to Brazilian Portuguese. Discov. Psychol. 4, 8 (2024).

Conflict of Interest: Nothing to declare.

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PO2.156

Association between nutritional status and weight gain with timing of eating during pregnancy in the Federal District, Brazil

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Introduction: The relationship between morningness/eveningness chronotypes on maternal outcomes is still controversy. The variables related to the timing of eating and weight gain in pregnancy women, which is considered as a period of nutritional vulnerability, is still poorly described in the literature.
Objective: This study aimed to investigate the association between nutritional status and the adequacy of weight gain during pregnancy with timing of eating in women monitored by Federal Distric Primary Care in the Federal District.
Methodology: The cross-sectional study carried out with adult pregnant women, participants in the Multicenter Study of Iodine Deficiency in Brazil (EMDI-Brazil). Anthropometric measurements were collected from the pregnant woman's card. The nutritional status was classified according to the pre-gestational body mass index and the gestational weight gain was evaluated according to Kac (2019), as recommended by the Ministry of Health of Brazil. The information regarding timing of eating was obtained by two 24-Hour Dietary Recall (24HR). The median of the first and last meal times was considered to classify the groups: early/early (G1), early/late (G2), late/early (G3) and late/late (G4). Poisson regression with robust variance adjusted for confounders was used to investigate associations of interest in Stata 14.2 software.
Results: 223 pregnant women were evaluated, with a mean age of 27.3 years (SD=5.9), of which 11.4% (95%CI 6.5-19.0) were classified as underweight and 21.7% (95%CI 14.8-30.7) with obesity. The median time for the first meal was 9:00AM and the last time was 8:40PM. The nutritional status classified as obesity was 8% (95%CI 4.8-30.7) in the G1 and 26.5% (95%CI 14.1-44.1) in the G4. Regarding the nutritional status and weight gain during pregnancy, no association with timing of eating was observed. However, a tendency for association between G4 with obesity and inadequate gestational weight gain was noted, suggesting that pregnant women with obesity more frequently consumed the first meal later than those with low weight and those with adequated weigh gain. The prevalence ratios between nutritional status and obesity were G1 0.33 IC95% 0,08-1,32; G2 0.74 IC95% 0,23-2,33; G3 1.48 IC95% 0,72-3,04; G4 1.41 IC95% 0,78-2,54, and the prevalence ratios between weight gain and inadequacy (above the recommendation) were G1 0.86 IC95% 0,46-1,60; G2 0.89 IC95% 0,40-1,94; G3 0.98 IC95% 0,51-1,88; G4 1.21 IC95% 0,71-2,06).
Conclusion: We suggest that time-related eating patterns should be considered in nutritional guidelines to ensure good diet quality of pregnant women since the beginning of gestation, contributing to avoiding excess weight gain during pregnancy and the prevention of metabolic-nutritional complications.

PO2.157

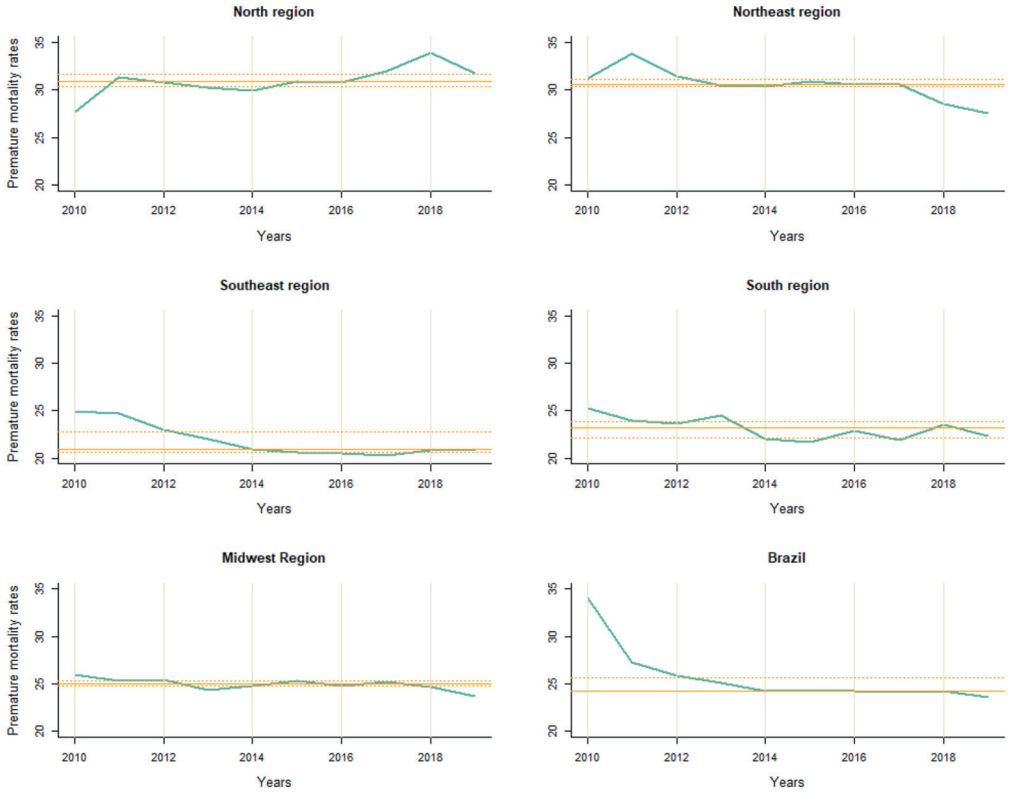
Diabetes premature mortality trend in Brazil before the covid-19 pandemic

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Introduction: Diabetes is an important chronic disease that causes significant mortality in Brazil every year. The aim of this study is to analyze the trend of premature mortality from diabetes in Brazil from 2010 to 2019.
Methods: Ecological time series study. The primary outcome is the premature mortality rates from diabetes, calculated from the ratio of the number of deaths caused by diabetes in people aged 30 to 69 to the Brazilian total resident population, multiplied by 100,000. The information was obtained from the Mortality Information System (SIM), using codes E10 to E14 of ICD10. Mortality rates were standardized by age using the direct method. Prais-Winsten regression analysis was applied on a logarithmic scale to estimate the annual trend of premature mortality from diabetes in Brazil and by its macroregions (North, Northeast, Southeast, South, and Midwest). Additionally, the annual percentage change (APC) was calculated.
Results: Between 2010 and 2019, premature mortality from diabetes averaged 25 deaths per 100,000 inhabitants. There were regional variations over time, with the North and Northeast regions presenting the highest average values: 31.0 deaths per 100,000 inhabitants and 30.6 deaths per 100,000 inhabitants, respectively, compared to the other regions. The trend in premature mortality from diabetes in Brazil was a 3% (CI: -5.30;-0.79) decrease yearly from 2010 to 2019. Except for the North region, the trend was similar to the national one, but on a smaller scale: Northeast, a reduction of 1.5% per year (CI: -2.65;-0.69), Southeast a decrease of 2.1% per year (CI: -3.60;-0.47), South a reduction of 1.1% per year (-2.10;-0.10) and Midwest, a decline of 0.6% per year (CI: -1.09;-0.07). For the northern region, the period showed an increase of 1.2% per year (CI: 0.43;2.03).
Conclusion: Premature mortality from diabetes decreased from 2010 to 2019 in Brazilian regions, except the North region, which showed an increasing trend. The results allow for monitoring and analyzing the dynamics of premature mortality from diabetes in the country. This information can potentially improve the understanding of its epidemiological profile, considering it is preventable through lifestyle changes sensitive to basic health care.

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Graph showing the time series of diabetes premature mortality rates in Brazil and its regions, between 2010 and 2019. The values correspond to number of death per 100.000 inhabitants.

Fig. 1. Diabetes premature mortality rates median value and interquartile range per region and Brazil's, 2010 to 2019.

PO2.158

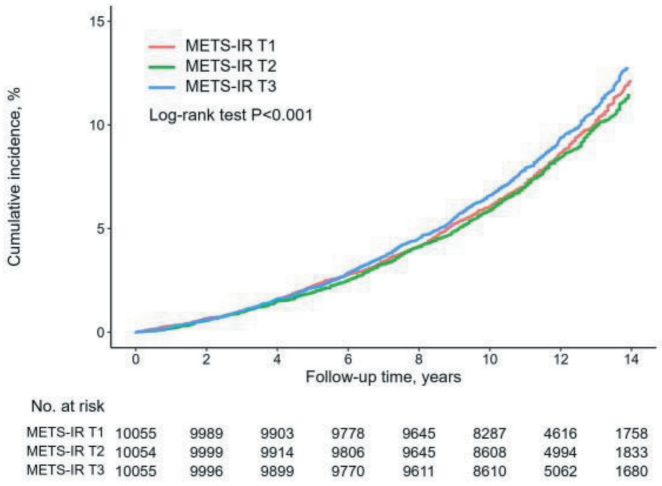
METS-IR and Mortality Risk in Older Korean Populations: A Study Based on Korean Genome and Epidemiology study-health Examinees Eata

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Background: The metabolic score for insulin resistance index (METS-IR) is a novel non insulin-based marker that indicates the risk for metabolic syndrome and type 2 diabetes mellitus (T2DM). However, METS-IR has not been investigated in relation to all–cause mortality. We investigated the longitudinal effect of METS-IR on all–cause mortality in a significantly large cohort of Korean adults over 60 years old.
Methods: Data were assessed from 30,164 Korean participants over 60 years of age from the Korean Genome and Epidemiology Study-Health Examinees (KoGES-HEXA) cohort data, linked with the death certificate database of the National Statistical Office. The participants were grouped into three according to METS-IR tertiles. We used multivariate Cox proportional-hazard regression models to prospectively assess hazard ratios (HRs) for all-cause mortality with 95% confidence intervals (CIs) over an 11-year postbaseline period.
Results: During the mean 11.7 years of follow-up, 2,821 individuals expired. The HRs of mortality for METS-IR tertiles were 1.16 (95% CI, 1.01–1.34) in T3 after adjustment for metabolic parameters, but the T2 did not show statistical significance towards increases for incident mortality respectively. In subgroup analysis depending on the cause of mortality, higher METS-IR was associated with cancer mortality (HR, 1.23, 95% CI, 1.01–1.51) but not with cardiovascular mortality (HR, 1.14, 95% CI, 0.83–1.57) after adjustment for the same confounding variables.
Conclusion: The METS-IR may be a useful predictive marker for all-cause mortality and cancer mortality, but not for cardiovascular mortality in subjects over 60 years of age. This implies that early detection and intervention strategies for metabolic syndrome could potentially benefit this identified group.

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The Kaplan-Meier survival curve, when stratified by METS-IR tertiles, illustrated an elevation in the cumulative incidence of all-cause mortality corresponding to an increase in METS-IR (log-rank test, P < 0.001).

Fig. 1. Kaplan-Meier curve for all-cause mortality.

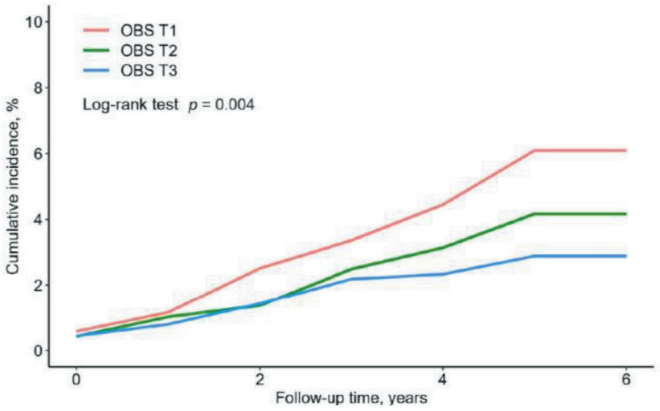
PO2.159

Assessing Diabetes Risk in Korean Seniors Through Oxidative Balance Score

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Background: The oxidative balance score (OBS) serves as an integrated marker of pro- and anti-oxidative status, commonly used to evaluate the risk of metabolic disorders and cancers. However, its association with type 2 diabetes mellitus (T2DM), especially in older adults, remains unclear. This study aimed to examine the long-term impact of OBS on the development of T2DM in a substantial cohort of Koreans aged 60 and above.
Methods: We assessed the data for 3516 participants aged 60 years and older without diabetes mellitus from the Health Examinees cohort of the Korean Genome and Epidemiology Study. We classified the participants into three groups according to OBS tertiles. We prospectively assessed hazard ratios (HRs) with 95 % confidence intervals (CIs) for new-onset T2DM using multivariable Cox proportional-hazard regression models during the mean 3.5 years following the baseline survey.
Results: A total of 109 participants (3.1 %) developed T2DM during a mean follow-up of 3.5 years. The incidence rates per 1000 person-years were 11.73 for the lowest OBS tertile (T1), 8.19 for the second tertile (T2), and 6.23 for the highest tertile (T3). Adjusting for all confounding factors, compared with the referent T1, the HR (95 % CI) of new-onset T2DM was not significant in T2 (0.71 [0.47–1.07]) but was significant in T3 at (0.47 [0.30–0.75]) (p for trend = 0.002).
Conclusions: The findings indicate that OBS may be an effective predictive marker for new-onset T2DM in older adults. Our research highlights the importance of healthy lifestyle changes, including maintaining a proper body weight, in reducing the risk of T2DM among the elderly. This suggests that OBS could serve as a practical tool for evaluating T2DM risk, even in older populations.



This figure presents the cumulative new-onset T2DM according to the OBS tertiles as Kaplan–Meier curves. The group T3 exhibited the lowest cumulative incidence of T2DM, which was statistically significant (logrank test, p = 0.004). The T2 and T1 groups followed in that order.

Fig. 1. Kaplan–Meier curves of the cumulative new-onset T2DM ac cording to the OBS tertiles.

PO2.160

Impact of a Cardiac Rehabilitation Program on Morphofunctional and Lifestyle Parameters in Post-Ischemic Cardiovascular Patients

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HUVV Unidad de Endocrinología y Nutrición

Introduction: Cardiovascular diseases (CVD) are the leading cause of mortality worldwide, significantly impacting public health and underscoring the importance of intervention programs. This study focuses on the inclusion of patients with ischemic cardiovascular events in a comprehensive Cardiac Rehabilitation Program (CRP) led by a multidisciplinary team.
Objectives: To describe the study cohort and evaluate analytical, clinical, morphofunctional, and lifestyle changes following a 12-week CRP.
Methods: A retrospective descriptive observational study was conducted on a cohort of 165 patients who completed a 12-week CRP. The program aimed to promote adherence to the Mediterranean diet and regular physical exercise, focusing on individualized patient-centered care.
Results: The cohort comprised 165 patients (75.2% men, 24.8% women) with a mean age of 58.1 years and a mean BMI of 28.99 kg/m². After completing the program, significant improvements were observed:

- Anthropometric and morphofunctional changes: Waist circumference decreased (-3.75 ± 0.66 cm), quadriceps contractile capacity (+0.21 ± 0.05 cm), area (+0.55 ± 0.17 cm²), and Y-axis length (+0.11 ± 0.04 cm) improved, while preperitoneal fat decreased (-0.12 ± 0.04 cm).
- Muscle strength and physical performance: Biceps dynamometry increased (+8.19 ± 1.43 kg), 6MWT distance (+70.80 ± 15.19 m) and speed (+0.59 ± 0.21 km/h) improved, as did ergometry performance (initial TAD -6.00 ± 1.42 mmHg and effort time +0.82 ± 0.20 min).
- Lifestyle and psychological well-being: Mediterranean diet adherence (+1.41 ± 0.28 points), physical activity (IPAQ: +408.50 ± 46.87 MET/week), and quality of life improved, with reduced anxiety and depression scores (HAD: -1.00 ± 0.32 points).

Conclusion: The CRP effectively improved morphofunctional parameters, muscle strength, exercise capacity, quality of life, and adherence to the Mediterranean diet, while reducing anxiety and depression. However, it did not significantly impact weight or BMI.

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PO2.161

Precision Medicine: The Role of Genetic Testing in the Treatment of Obesity

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Obesity-related genetic disorders are characterized by severe, early-onset obesity due to mutations affecting central pathways, particularly the hypothalamic leptin-melanocortin pathway. These disorders, including monogenic and syndromic obesities, are often underdiagnosed, with an estimated prevalence of 5-10% in children with severe obesity. Due to underdiagnosis in the pediatric population, many adults presenting for clinical care may also display these characteristics: a history of childhood obesity, hyperphagia, and severe obesity that have gone undiagnosed. In addition, limited awareness of genetic conditions, variability in symptom presentation, and the lack of access to genetic testing further complicate accurate diagnosis. Stigma surrounding severe obesity and hyperphagia continues to also hinder access to care and proper diagnosis for those with genetic forms of obesity.

Genetic testing plays a critical role in diagnosing and managing obesity-related genetic disorders, enabling early interventions and treatment decisions. While monogenic gene variants causing obesity are rare, identifying these mutations is increasingly justified due to the development of mutation-specific therapies, such as setmelanotide, a melanocortin-4 receptor (MC4R) agonist. Setmelanotide has shown success in reducing hyperphagia and promoting weight loss in patients with POMC, PCSK1, and LEPR deficiencies and for the treatment of obesity associated with BBS (Bardet-Biedl Syndrome).

Despite recent advancements in both surgical and medical treatments for obesity, clinical practice continues to reveal significant variations in treatment responses, which remain poorly understood. Could genetics be the missing link to these differences? Can genetic testing help reduce the stigma associated with obesity?

These are some of the critical questions the clinical and research team at the University of Utah are working to address. We conducted a five-year retrospective study of 307 patients who underwent genetic. Analysis revealed that 71.7% had positive test results, including known pathogenic variants and variants of unknown significance. Among those who underwent bariatric surgery, individuals with positive genetic variants associated with obesity had between 1 to 4 variants per person. The lowest EBWL (<25%) was observed in non-responders with known pathogenic mutations, PCSK1 and LEPR, as well as in those with KSR2, BBS1, BBS10, and PLXNA3 mutations. We collaborated with psychologist colleagues to examine whether genetic testing for obesity can reduce self-blame and stigma, and how the results may impact treatment outcomes. Findings from a pilot study revealed a "double-edged sword" effect of genetic obesity test Results: those with positive results felt emotional relief (e.g., less self-blame) but also diminished perceived personal control over their health, while those with negative results experienced frustration and self-blame but stronger motivation to improve diet and exercise behaviors. Based on this study findings, we have developed standardized clinical workflows and communication strategies for discussing obesity genetic testing and results for patients.

Monday, 12 May 2025

PO3 - CHILDHOOD and ADOLESCENT OBESITY

PO3.001

Establishing Normative Reference Values for Handgrip Strength in Children and Its Relationship With Nutritional Status

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Introduction: This study aimed to establish normative reference data for hand grip strength (HGS) in children aged 6-10 and to explore its association with nutritional status.

Methods: A total of 1533 children (736 boys) participated in the study. Demographic characteristics and eating habits were assessed through questionnaires. The body weight, height, and HGS measurements of the children were taken by the researcher. JAMAR hand dynamometer was used for HGS measurements and Southampton Protocol was followed. The Lambda-Mü-Sigma (LMS) method was employed to construct the HGS curves.

Results: The mean age of the children is 8.2±1.32 years. The 50th percentile values for dominant handgrip strength (HGS) in boys were found to be 6,745, 8,103, 9,878, 11,495, and 12,166 kg at ages 6, 7, 8, 9, and 10, respectively. For girls, the corresponding values were 5,447, 6,811, 8,713, 10,670, and 10,949 kg. While a statistically significant relationship was found between dominant HGS and BMI for age, weight for age, and height for age in boys, this relationship was shown only with weight for age in girls. Birth weight exhibited a positive correlation with HGS for both hands ($p<0.05$). In the regression analysis height and birth weight group have a statistically significant relationship with dominant HGS.

Conclusion: HGS is a simple and objective parameter that can be used to evaluate muscle strength. It is closely related to the variables of age, gender, body weight, height, and BMI, and its use can be practical in determining nutritional status. To the best of our knowledge this study

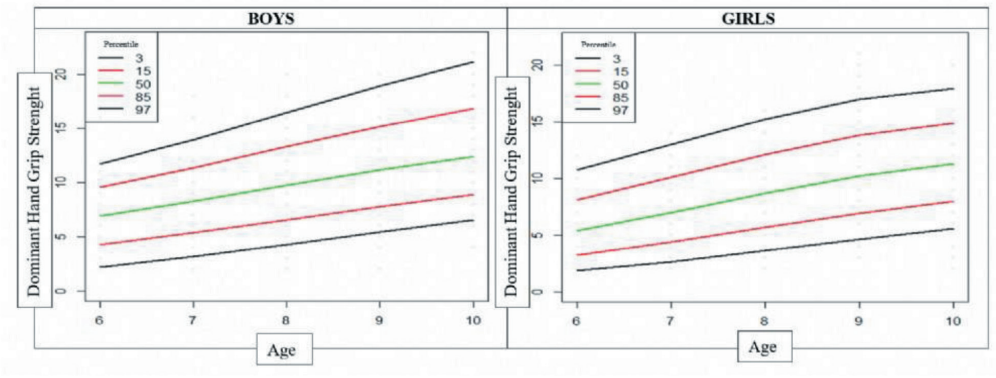


Fig. 1. Normative Reference Values for Handgrip Strength.

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is the ninth study in the literature for HGS normative reference values in children. The use of muscle strength measurements in the evaluation of nutritional status in children should be expanded.

Conflict of Interest: None Disclosed.

Funding: No funding to report

PO3.002

Changes in Body Mass Index in children before, during, and after COVID-19

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Introduction: Significant changes in Body Mass Index (BMI) have been observed in children and adolescents during the COVID-19 pandemic; however, changes in BMI after COVID-19 remain largely unknown. The aim of the present study was therefore to examine changes in BMI in Danish children during and after COVID-19 as compared to before COVID-19.
Methods: A nationwide, population-based retrospective prevalence register study using data from Danish healthcare registries. The study was conducted from March 11th, 2019 to January 31st, 2024 (i.e. one year before to two years after the pandemic). All Danish children aged 7 or 13 years during the COVID-19 time periods (before, during, and after) were eligible for inclusion and outcome data on iso-BMI was obtained from The Children's Database and children with outcome data (i.e. anthropometric assessments) available in The Children's Database were included in the analysis. Exposure was Danish national COVID-19 lockdowns and main outcome was changes in iso-BMI. Using log-binomial regression, crude and adjusted prevalence ratios (aPRs) of age- and sex-adjusted BMI (iso-BMI) categories were calculated using pre-COVID-19 levels as reference, adjusting for sex, household income, and parental education.
Results: In 7-year-olds (n=268,761), a decrease in underweight was observed during COVID-19 only; in contrast, an increased prevalence of underweight was found in 13-year-olds (n=158,174) after COVID-19 (aPR = 1.15 [95% CI: 1.06-1.24]). The prevalence of overweight increased in 7- and 13-year-olds during COVID-19, both returned to pre-COVID-19 levels afterwards; aPRs = 0.97 [95% CI: 0.94-0.99] and 0.95 [95% CI: 0.93-0.98], respectively. Likewise, the prevalence of obesity increased in 7- and 13-year-olds during COVID-19, and post-COVID-19 levels of obesity remained elevated in 7-year-olds (aPR = 1.12 [95% CI: 1.07-1.18]).
Conclusion: Prevalence of overweight and obesity increased during COVID-19, with overweight declining post-COVID-19. The prevalence of obesity; however, remained increased among 7-year-old children. Additionally, an increased prevalence of underweight was found in 13-year-olds after COVID-19, highlighting differing trends in children of varying ages and stressing the need for a differentiated approach.

PO3.003

Parenting in Sync: Coparenting Dynamics and Obesity-Related Lifestyle Behaviors in Early Childhood

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Introduction: Parenting practices are critical determinants of children's eating and physical activity behaviors. Structured and autonomy-promoting practices are generally beneficial, while controlling practices can have negative effects. However, the influence of coparenting dynamics (whether parents align or diverge in their practices) remains understudied. This study aimed to investigate differences in children's eating and active play behaviors across six predefined coparenting dynamics among 113 mother-father dyads of children aged 2–5 years.
Methods: Parents self-reported their food and physical activity parenting practices using validated items, which informed six a-priori coparenting dynamics: Disengaged (neither parent engaged in any practice), Overengaged (both parents engaged in all practices), Solo (one parent engaged, the other disengaged), Cooperative (both parents used structure/autonomy without control), Controlling (both parents used control), and Conflicting (one parent used control, the other used structure/autonomy). Parents also reported on child eating behaviors (emotional overeating, food responsiveness, food fussiness, satiety responsiveness), food intake (fruits/vegetables, sugary beverages, sweet/salty treats), and activity levels (active and outdoor play). Group differences were analyzed using Kruskal-Wallis tests with post hoc Holm's adjustment.
Results: Children with Cooperative coparents consumed fewer sugary beverages ($\bar{x}$=.6) than their peers with Disengaged ($\bar{x}$=2.5 p=.010) and Controlling ($\bar{x}$=2.4 p=.023) coparents, ate fewer sweet/salty treats ($\bar{x}$=2.8) than those with Controlling coparents ($\bar{x}$=4.7 p=.049) and had lower emotional overeating ($\bar{x}$=1.1) than those with Solo ($\bar{x}$=1.6 p=.012) and Controlling ($\bar{x}$=1.8 p=.003) coparents. Daily active play was higher on weekdays among children with Cooperative coparents ($\bar{x}$=87 min) compared to those with Disengaged ($\bar{x}$=30 p=.029) and Controlling ($\bar{x}$=30 p<.001) coparents, and lower among children with Controlling coparents relative to those with Solo ($\bar{x}$=56 p=.005) and Conflicting ($\bar{x}$=64 p=.001) coparents. On weekends, daily active play was higher in children with Cooperative coparents ($\bar{x}$=107) than those with Controlling coparents ($\bar{x}$=66 p=.019), who also had less active play time than children with Conflicting coparents ($\bar{x}$=99 p=.033). Lastly, children with Cooperative coparents spent more days/week playing outdoors ($\bar{x}$=4.2 days) than their peers with Controlling coparents ($\bar{x}$=2.5 p=.012), who also had fewer outdoor play days than those with Conflicting coparents ($\bar{x}$=3.7 p=.049). Child sex, parental education and household income did not differ by coparenting groups, but coparents Overengaged in food practices had older children than Solo parents ($\bar{x}$=4.6 vs 3.9 years p=.015).
Conclusions: Child lifestyle habits varied significantly across coparenting dynamics. Positive dynamics predicted the most favorable outcomes, while negative or misaligned dynamics were associated with poorer outcomes. Our findings suggest the critical need to consider both parents in interventions targeting obesity-related lifestyle behaviors in young children.

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PO3.004

Explainable Artificial Intelligence for Identifying Childhood Obesity Biomarkers: Integrating Genomics and Managing Data Imbalance

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Introduction: Childhood and pubertal development are critical periods for metabolic health. Childhood obesity increases the risk of insulin resistance (IR), precursor to metabolic dysfunction and cardiovascular disease. This work develops predictive regression models based on Artificial Intelligence (AI) for IR and obesity, addressing data imbalance and the need for interpretability in healthcare to improve diagnosis and treatment. We propose a multi-objective evolutionary algorithm (MOEA) that generates linguistic fuzzy rule-based models, integrating multi-omics data to overcome these challenges.
Methods: We tackled imbalanced regression by predicting the Homeostatic Model Assessment of Insulin Resistance and Waist Circumference z-scores (zHOMA-IR and zWC) in Spanish children (3–18 years) with overweight/obesity. Data included genomics (PolyGenic Scores, PGSs), targeted proteomics and metabolomics, and anthropometric data. We extended a MOEA to simultaneously address data imbalance and interpretability for the first time. A 6x5-fold stratified cross-validation ensured minority subdomain representation. Comparisons to 7 approaches included Random Forest (RF) with post-hoc SHAP explanations, the original MOEA, a precision-oriented linguistic rule-based MOEA (LING), and their use with SMOGN (a preprocessing technique for imbalanced regression), as well as an imbalance-handling version of LING with limited interpretability. Predictive performance was assessed using the Mean Squared Error (MSE), minority subdomain representation, via an adapted F1-score, and fuzzy model interpretability, via the Geometric Mean of 3 complementary Metrics (GM3M) and Rule Meaning Index (RMI).
Results: Despite all children living with overweight/obesity, target variables showed imbalance (5–9%). RF achieved the best MSE but poorly represented relevant subdomains (F1), relying on post-hoc SHAP for interpretability. LING faced interpretability issues and its extension showed limited F1 improvement. SMOGN improved F1 across all methods but worsened MSE, especially for zWC. Our method achieved high F1 for zHOMA-IR and the best for zWC, maintaining competitive MSE and enhanced interpretability (models with a mean of 7 rules and 3 variables). PGSs, specially related to insulin (PGS000307, PGS000834), BMI (PGS003124) and type 2 diabetes (PGS000014), were key, as well as family history and metabolites like triglycerides. These results underscore the need to integrate genetic, familial and lifestyle factors in the study of childhood obesity.
Conclusion: Our method addressed data imbalance and interpretability in childhood obesity modeling, generating interpretable models with superior F1 and robust MSE. PGSs integration underscores the role of genetic factors in metabolic outcomes, highlighting the potential of interpretable, fair and accurate AI to improve understanding and support prevention and treatment.

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PO3.005

Cigarette smoking in youth decreased during obesity treatment

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Introduction: Having obesity at a young age is associated with increased risk of cardiovascular disease, diabetes mellitus type 2, hypertension, and shortened life expectancy. Among young adults with obesity, smoking is sometimes used as a method for weight management, but health risks are even more increased for those who smoke. Improving lifestyle habits in one area can have a positive transfer effect on other habits. This study aimed to investigate whether smoking habits in youth with obesity changed during specialist obesity treatment, even though smoking habits were not explicitly addressed.
Methods: We have followed16 to 25-year-olds with obesity within the Swedish Youth with Obesity (SYO) cohort. Participants who were admitted to obesity treatment at a Swedish specialist clinic, and who had responded to questions about smoking at both admission and after 18-months of follow-up were included in the analyses (n=166). We excluded patients scheduled for obesity surgery as pre-surgery treatment include advice about smoking cessation.
Results: At admission, 24% (n=40) were smokers. Of those, 58% (n=23) had quit smoking after 18 months of obesity treatment. Of the 18 participants who reported being daily smokers at admission, 22% (n=4) still smoked daily at 18 months. Among those that reported being non-smokers at admission, 9.5% (n=12) reported being smokers at the 18-month follow-up.
Conclusion: More participants quit or reduced than started smoking during 18 months of specialist obesity treatment. While smoking habits were not specifically addressed, the obesity treatment may have a positive impact on smoking cessation in youth with obesity. However, as some participants began smoking, we recommend that advice against tobacco use be included in obesity treatment programs.

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PO3.006

Evaluating medical students' knowledge, skills and attitudes on managing childhood obesity: a pilot study

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Background: With the increased prevalence of overweight and obesity in the last 3-4 decades, there is an urgent need for improved undergraduate health-professional education related to child and adolescent obesity (CAO). Literature suggests that medical students feel unprepared to address CAO and additional training is needed[1]. This study explored the initial impacts of a CAO educational intervention on the knowledge, skills and attitudes of medical students.

Methods: This was a pilot observational study evaluating a blended educational intervention utilising an online course, recorded lecture and case-based discussions (CBDs) on CAO for final year medical school students with ethical approval granted by University of Limerick. The online course and recorded lecture were informed by clinical guidelines, addressed key aspects of CAO management and in addition to multiple-choice questions, were completed by students prior to attending the CBDs. The CBDs facilitated history taking, physical examination and management of CAO. Students completed a readiness assurance test[2] at the start of the CBD and received emailed take-home points after the CBD. Students completed a Likert scale-based questionnaire addressing perceived knowledge, skills and attitudes on CAO before and after the intervention. Results were analysed descriptively.

Results: We present pilot results for 29 students who attended the CBD session, with pre-and post-intervention questionnaires completed by 24 (83%) and 20 (69%) consenting students, respectively (Figures 1 and 2).

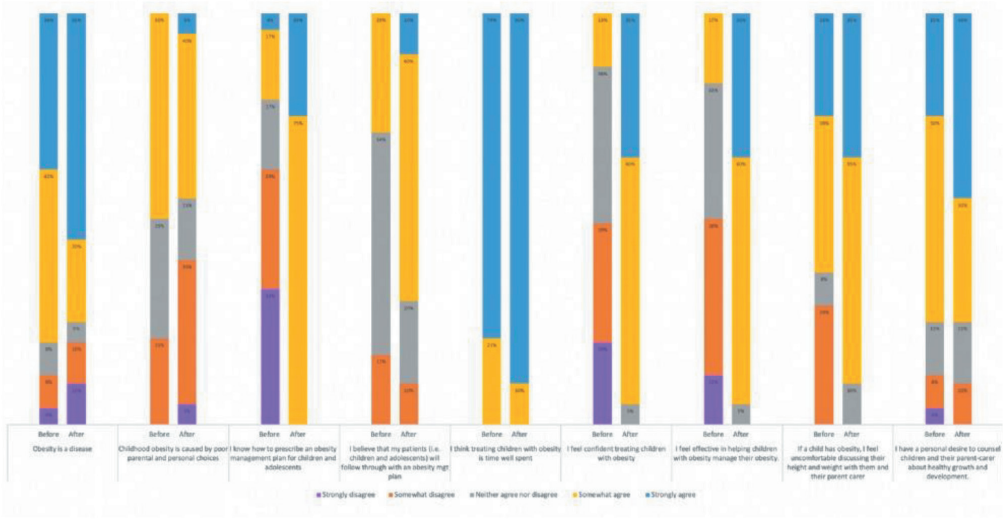


Fig. 1. Student attitudes towards childhood obesity - baseline (Before) and post-CBD (After) frequencies.

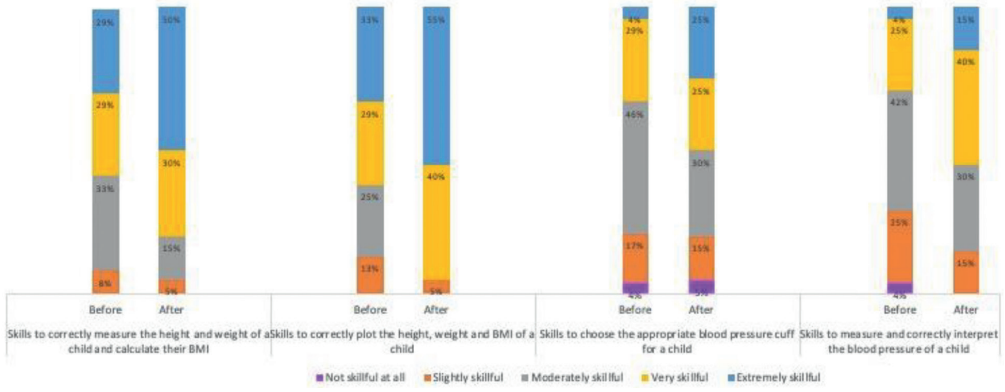


Fig. 2. Students self-reported skills- baseline (Before) and post-CBD (After) frequencies.

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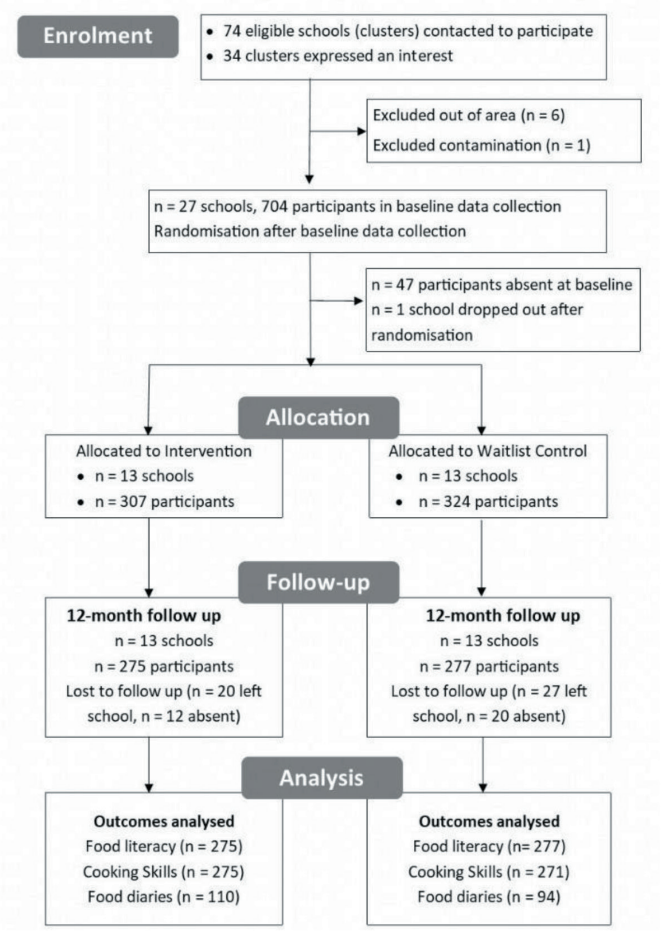
Post intervention there were increases in self-reported confidence in prescribing a CAO management plan (21% to 100%); treating CAO (13% to 95%); and in disagreeing with the statement that childhood obesity is caused solely by poor parental and personal choices (21% to 40%).
Students self-reported knowledge of the aetiology of CAO increased (62% reporting no/little knowledge vs 90% reporting moderate/extreme knowledge post-CBD). Self-reported skills on plotting growth increased (62% to 95%) as did ability to interpret blood pressure measurements in a child (29% to 55%). Knowledge of physical activity, nutrition recommendations and referral pathways increased (8% to 80%; 25% to 75% and 38% to 85%). While self-reported knowledge of appropriate language to discuss CO increased (75% to 95%), there was an increase in the percentage of students who reported feeling uncomfortable discussing CO with children and their families (63% to 90%).
Conclusions: Our preliminary results suggest that the educational intervention enhanced final year medical students' self-perceived knowledge, skills and attitudes regarding CO at the end of their Paediatric rotation. Although no statistically significant differences were observed, this remains to be proven.

PO3.007

Evaluation of the established PhunkyFoods programme in UK on food literacy and cooking skills in primary school-age children

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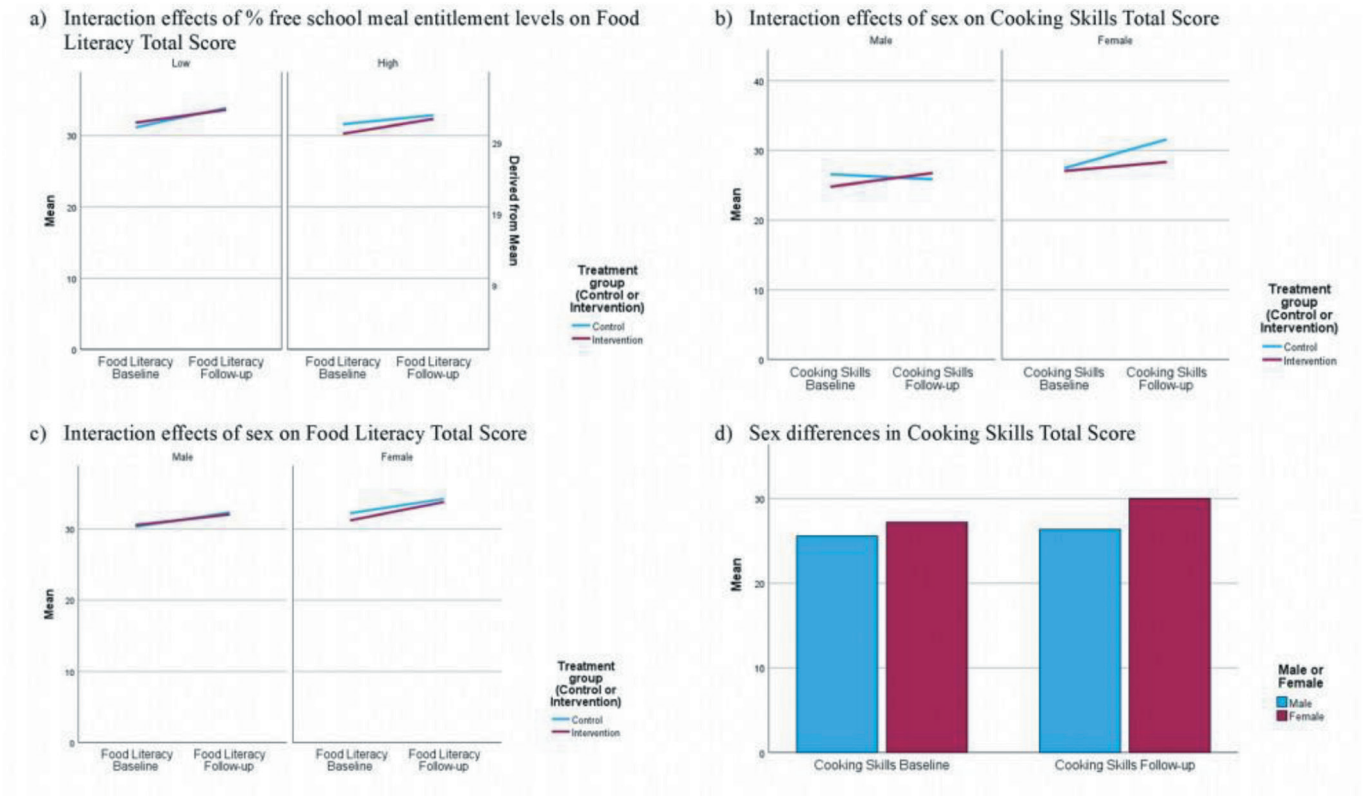
Introduction: Obesity is an important issue in primary schools in the UK, with the prevalence doubling from the start to the end of primary schools. Schools can help by teaching children about cooking and nutrition. Evaluating existing established programs is crucial for understanding their long-term effectiveness and sustainability. Unlike one-off interventions, which often aim to test specific hypotheses or theories without a plan for integration into broader curricula, established programs have already demonstrated a degree of success and acceptance. We evaluated the impact of an established nutrition education intervention, 'PhunkyFoods' on food literacy and cooking skills in primary-school aged children. Improving these skills is essential for fostering healthy eating habits and preventing obesity from an early age.
Methods: A pre-registered cluster randomised controlled trial was used; the intervention group received the 'PhunkyFoods' programme and the wait-list control group received the usual school curriculum. Primary outcomes measured were differences in food literacy and cooking skills scores between the intervention and control arms after 12 months adjusted for baseline values. The trial was undertaken in 26 primary schools in North Yorkshire, UK. Children aged 6 – 9 years participated through whole school assemblies, classroom activities and after-school clubs on food preparation, cooking nutritious meals and healthy living. Aspects of the programme delivered varied by school, reflecting the real-life aspects of established programmes. Data were analysed used mixed multilevel regression to account for the effects of clustering and included adjustments for baseline values.
Results: A total of 631 participants completed the study and data were analysed using mixed multilevel regression to account for the effect of clustering. The between treatment group differences for Food Literacy Total Score was -1.13 (95% CI -2.87 to 0.62, p = 0.2) at follow up, adjusting for baseline. The between treatment group difference for Cooking Skills Total Score was -0.86 (95% CI = -5.17 to 3.45, p = 0.69). Girls scored significantly 1 point higher than boys in food literacy (95% CI = 0.4 to 1.63, p = 0.001). Girls scored significantly 2.8 points higher than boys in cooking skills (95% CI = 0.88 to 4.82, p = 0.005). There were no significant effects of the intervention compared to control on food literacy, cooking skills, vegetable intake or fruit intake.
Conclusion: The intervention did not lead to improved food literacy or cooking skills, although there were observed sex differences in these outcomes. This evaluation has generated recommendations for refining and enhancing the existing PhunkyFoods intervention. By building on its strengths and incorporating more practical food preparation hours for a larger number of children, the likelihood of achieving positive outcomes can be increased.



Consort Flow Diagram of recruitment and trial allocation for children aged 6 - 9 years

Fig. 1. Consort Flow Diagram.

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Secondary analysis: a) interaction effects of % free school meal entitlement levels on Food Literacy, b) interaction effects of sex on Food Literacy c) interaction effects of sex on Cooking Skills d) sex differences in Cooking Skills.

Fig. 2. Secondary analysis of interaction effects on Food Literacy and Cooking Skills.

PO3.008

Rapid infant weight gain and childhood obesity risk: investigating the role of linear growth

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Introduction: Rapid infant weight gain, commonly defined as upward crossing through one UK centile band, has consistently been found to be associated with increased risk of overweight/obesity in childhood. This association is, however, self-fulfilling in the sense that it partly reflects tracking of weight (from the end of the infancy exposure period to childhood) and is likely to depend on the pattern of linear growth an infant demonstrates. The aim of this study was to examine how the association of rapid infant weight gain with childhood BMI and overweight/obesity is moderated by linear growth.

Method: The sample comprised 3,576 participants in the the Avon Longitudinal Study of Parents and Children with weight and length/height data at birth, age nine months, and age nine years. A categorical exposure was computed to identify infants with slow (<−0.67 Z-scores), average (−0.67 to +0.67; referent), or rapid (> +0.67) weight gain between birth and nine months. Another categorical exposure was computed to identify infants with slow, average, or rapid linear growth, using the same Z-score thresholds. The outcomes were BMI Z-scores and weight status (overweight/obese vs normal weight) at nine years. Regression models were used to examine how the associations of the infant weight gain exposure with the outcomes were modified by the linear growth exposure.

Results: Overall, 40% of the sample demonstrated rapid infant weight gain and 19% were overweight/obese at nine years. Infants with rapid weight gain had 1.55 (1.19, 2.01) times higher odds of overweight/obesity at nine years than infants with normal weight gain. The comparable estimate for rapid linear growth was 1.20 (0.93, 1.55). Rapid infant weight gain was associated with 2.07 (1.42, 3.01) times higher odds of overweight/obesity if linear growth was normal, but among infants with rapid linear growth the odds were 1.36 (0.89, 2.07). The ratio of these two odds ratios was 0.66 (0.38, 1.13). Analyses with the BMI Z-score outcome provided no evidence of effect modification.

Conclusions: Rapid weight gain was not significantly associated with later overweight/obesity risk among infants with rapid linear growth. However, our sample was likely underpowered to formally demonstrate a modifying effect of linear growth on the association between rapid infant weight gain and childhood overweight/obesity risk.

Conflict of Interest: None disclosed.

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PO3.009

The Prevalence of Prediabetes is High and Has Rapidly Increased Independent of Body Weight in Finnish Children with Overweight or Obesity

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Introduction: The global increase in pediatric obesity predisposes individuals to prediabetes or type 2 diabetes, but data on their prevalence, temporal trends, and associated factors in children and adolescents remain limited. We examined these issues in well-defined patient and population cohorts.
Methods: Data were collected from 602 pediatric patients aged 6-16 years, who were examined in healthcare for overweight/obesity 2002-2020. The control group comprised 483 population-representative children aged 7-16 years, who participated in 1-3 prospective visits. Prediabetes was defined as fasting glucose 5.6–6.9 mmol/L or 2h-post-challenge glucose 7.8–11.0 mmol/L, and diabetes as values ≥7.0 mmol/L or ≥11.1 mmol/L respectively. Factors associated with prediabetes in patients were studied using logistic regression.
Results: Altogether, 89.2% of patients and 3.3-4.7% of controls had obesity. The prevalence of prediabetes was 34.2% and of type 2 diabetes 1.3% among patients, and 6.9% and 0% in controls respectively, with prediabetes increasing significantly with age and stage of puberty. Both conditions were associated with presence of MASLD (OR 1.7, 95% CI 1.0-2.8), acanthosis nigricans (1.8, 1.1-3.2), and ALT >80 U/l (2.4, 1.1-5.3) after adjusting for BMI or age. In patients, prediabetes prevalence increased from 16.0 to 50.0% over time (p<0.001) without concurrent changes in obesity prevalence, BMI, other metabolic conditions, age, sex, or gestational/neonatal factors, except for an increase in maternal prepregnancy/pregnancy overweight (35.4% to 68.8%, p=0.005).
Conclusion: Prediabetes was decidedly prevalent in pediatric patients with obesity and was associated particularly with MASLD. Its prevalence increased steeply over time, independent of obesity.

PO3.010

Moderating the Impact of Socioeconomic Inequalities on Childhood and Adolescent Obesity: The Role of Neighborhood Greenery

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Background: Addressing socioeconomic disparities in obesity among children and adolescents is critical. While greenspaces have been associated with improved health outcomes, whether they moderate obesity inequalities remains unclear. We investigated whether neighborhood greenery modifies the relationship between socioeconomic status (SES) and obesity in Spanish youth.
Methods: We analyzed data from the 2022 PASOS study, comprising 2314 participants aged 8–16 years. Obesity indicators included BMI z-scores, waist circumference, and waist to height ratio. SES was assessed using a composite index of parental education, employment, and income, and greenery was measured via the normalized difference vegetation index (NDVI) within a 1 km buffer around residences. Multilevel linear regression models examined associations between SES and obesity and evaluated their potential moderation by neighborhood greenery.
Results: Lower SES was consistently associated with higher waist-to-height ratios, highlighting pronounced socioeconomic disparities in obesity. Although the global interaction between SES and greenery did not reach statistical significance (p=0.0625), stratified analyses revealed important patterns. The greatest disparities for children from lower SES backgrounds were observed in areas with low greenery (quintiles 1 and 2), where waist-to-height ratios were significantly higher ($Q2$, p=0.772, p<0.001). Conversely, in neighborhoods with higher greenery (quintiles 4 and 5), SES-related disparities in obesity measures were weaker. Children from the most favorable SES consistently showed lower obesity levels, particularly in areas with higher greenery ($Q5$, B=−0.202, p=0.043).
Conclusion: Children from lower-SES backgrounds exhibited higher levels of obesity, with disparities most pronounced in areas with less greenery. Higher greenery appeared to attenuate these SES-related disparities, suggesting a potential role for greenspaces in mitigating health inequalities. These findings support policies promoting equitable access to greenery to help address childhood obesity disparities.

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Tab. 1. Associations of composite SES with waist-to-height ratio in children aged 8–16 years —PASOS study. Spain, 2020.

	Model 1	Model 2
	B (95% CI)	B (95% CI)
Composite SES		
Less favorable	0.156 (-0.026, 0.338) †	0.151 (-0.04, 0.342)
Intermediate	ref	ref
Most favorable	-0.227 (-0.318, -0.135) ***	-0.234 (-0.328, -0.139) ***

Performed by multilevel linear regression analysis. 2Model 1: Adjusted for gender and age. 3Model 2: Adjusted for gender, age, NDVI. † p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001, Bold figures denote significant coefficients. Composite SES = Composite SES categories were created by combining each indicator and obtaining the less favorable category (Less than University/Unemployed/annual mean income below the mean; n = 113), the most favorable one (University/Employed/annual mean income ≥ the mean; n = 567), and the intermediate ones as reference.

Tab. 2. Significance of the interaction between composite SES and greenery: results of Wald tests.

	Wald chi-square	P value
Greenness (NDVI)		
NDVI 1Km	14.832	0.0625

Multilevel linear regression models adjusted for gender, age, NDVI and composite SES. Bold figures denote significant interaction

Tab. 3. Associations of composite SES with waist-to-height ratio stratified by tertiles of the greenery measures in children aged 8–16 years —PASOS study Spain, 2020.

	B (95% CI)	B (95% CI)	B (95% CI)
	Less favorable	Intermediate	Most favorable
Greenness (NDVI)			
Low Exposure (Q1)	-0.049 (-0.402, 0.304)	ref	-0.262 (-0.47, -0.054)*
Moderate Low Exposure (Q2)	0.772 (0.331, 1.213) ***	ref	-0.238 (-0.469, -0.006) *
Moderate Exposure (Q3)	-0.285 (-0.644, 0.074)	ref	-0.265 (-0.475, -0.055) *
Moderate High Exposure (Q4)	0.263 (-0.227, 0.754)	ref	-0.242 (-0.451, -0.032) *
High Exposure (Q5)	0.391 (-0.215, 0.998)	ref	-0.202 (-0.398, -0.007) *

Performed by multilevel linear regression analysis. Adjusted for gender and age. † p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001, Bold figures denote significant coefficients.

PO3.011

Lifestyle intervention in adolescent girls with obesity

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Introduction: The very high prevalence of obesity in children and adolescents worldwide is reaching pandemic levels. Lifestyle modification is the first line therapeutic option in treatment of children with obesity. The aim of the study was to examine the effect of hypocaloric diet and high-intensity interval training (HIIT) on cardiometabolic biomarkers, hormonal parameters and cardiorespiratory fitness in adolescent girls with obesity.
Methods: Adolescent girls with obesity (n = 44, 13-19 years old) were randomized into a 12-week intervention as follows: 1) dietary advice and HIIT (n = 22), and 2) dietary advice only (n = 22). The concentration of biomarkers of inflammation, biochemical and hormonal testing, oral glucose tolerance test, cardiorespiratory fitness, physical activity levels and nutrition were assessed. Insulin resistance was determined using the homeostatic model assessment (HOMA-IR), the insulin sensitivity index (ISI) of Matsuda, AUCglucose and AUCinsulin.
Results: After 3-month intervention, Diet+AIT group significantly increased basal metabolic rate (Δ±SD; 14±46 kcal vs. 104±80 kcal; p=0.000, Diet vs. Diet+AIT, respectively), ISI (-0.34±1.52 vs. 1.05±3.21; p=0.001) and work load (0.6±11.3 watts vs. 14.6±20.2 watts; p=0.024) and decreased AUCglc (-0.29±4.69 vs. -0.98±4.06; p=0.040), AUCins (-9.65±117.9 vs. -98.7±201.8; p=0.003) and hsCRP (0.12±1.92 mg/L vs. -1.47±3.67 mg/L; p=0.039) in comparison to Diet group. Regarding within-group changes, both groups had significant reduction in body mass index (BMI), BMI-standard deviation score, body fat percentage, systolic blood pressure and free thyroxine. Positive impact on waist circumference (WC), diastolic blood pressure, hsCRP, work load, maximal and rest heart rate was observed only after Diet+AIT intervention. No significant change was noted in peak oxygen uptake, lipid profile and hormonal parameters between groups after intervention.
Conclusion: Exercise-based interventions in children and adolescents improve anthropometric (body weight, BMI, WC, fat mass) and cardiometabolic (lipid profile, insulin sensitivity, systolic and diastolic blood pressure) parameters and cardiorespiratory fitness. Combination of hypocaloric diet and HIIT, after three months, leads to a reduction in the main cardiovascular risk factors - abdominal fat, high insulin concentrations, systolic and diastolic blood pressure.

Conflict of Interest: None Disclosed

Funding: No funding to report

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PO3.012

Correlations between lifestyle and the circulating proteomic profile in children with obesity and after a behavioral intervention

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Introduction: The causes and perpetuating factors of childhood obesity go beyond an individual's biology, with elements such as family structure and socioeconomic environment playing a key role. Our aim was to analyze how external factors like the nutriome, lifestyle, and socioeconomic environment influence the proteomic profile of children with obesity compared to those with normal weight, and to assess the impact of lifestyle changes on the proteomic profile of children with obesity.
Methods: Sixty-eight pediatric patients, both with and without obesity, were prospectively recruited from a single referral center. Blood samples were collected for proteomic analysis, and participants completed questionnaires on physical activity, diet, screen time, sleep, and socioeconomic factors. Twelve patients with obesity underwent a 6-month protocolized lifestyle intervention. The circulating proteomic profile was analyzed, and lifestyle information was recorded through the same questionnaires both before and after the behavioral intervention.
Results: Children with obesity exhibited excessive screen use, particularly mobile devices, which correlated with lack of sleep and alterations in GHRL, insulin, and HOMA-IR. Physical activity was associated with improvements in GHRL, TGFβ1, insulin, and HOMA-IR. Sleep duration showed a significant positive correlation with HSD11B1. Among children who completed the behavioral intervention, physical activity was linked to improvements in TGFβ1 and OLR1. Adhering to recommendations for screen use and physical activity amplified the changes observed in LDL-c, CCL2, GDF2, and LAMP3 after the intervention. By the end of the intervention, the association between excessive screen use, insulin resistance, and cardiovascular risk persisted.
Conclusions: Children with obesity exhibited distinct lifestyle characteristics that correlated with the observed metabolic and inflammatory alterations. Lifestyle modifications were associated with improvements in altered proteins, highlighting the impact of the behavioral intervention in these patients.

PO3.013

Revealing Hidden Links: Using Correspondence Analysis to Decode Maternal Lifestyle and Gestational Weight Gain

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Introduction: Inadequate gestational weight gain (GWG) represents a critical clinical and public health concern due to its strong association with adverse maternal and neonatal outcomes, including heightened risks of preterm birth, low birth weight, and long-term health complications for both mother and child. Understanding the multifaceted determinants of GWG, such as maternal lifestyle factors (e.g. dietary patterns, physical activity levels) and pre-pregnancy Body Mass Index (BMI), is essential for developing effective preventive strategies. This study employs correspondence analysis (CA), a robust statistical method for visualizing complex relationships among categorical variables, to elucidate patterns linking maternal behaviors with deviations from recommended GWG. The findings aim to inform targeted interventions promoting optimal GWG and improving maternal-infant health outcomes.
Methods: A CA was conducted using baseline data from the ongoing LIMIT perspective cohort study. The analysis included 162 subjects with complete maternal characteristic data to explore associations between maternal features and GWG. Results were visualized through a two-dimensional graphical representation, with statistical measures, including inertia, eigenvalues, and contributions, applied to assess the strength of these associations and the variance explained by the dimensions.
Results: CA revealed that excess GWG was most strongly associated with Dimension 1, which captured 71.0% of the inertia, reflecting maternal behaviours such as pre-pregnancy overweight and poor adherence to the Mediterranean diet. Dimension 2, which explained 59.5% of the inertia, was primarily influenced by adequate GWG and highlighted healthier lifestyle behaviours, particularly vegetable consumption. Maternal profiles with lower education, smoking, high meat consumption, and pre-pregnancy overweight or obesity were positioned closer to excess GWG. In contrast, medium Mediterranean diet adherence showed a slight association with low GWG, while underweight and obese mothers were more frequently associated with adequate GWG.
Conclusions: This study highlights maternal lifestyle factors, including diet and physical activity, as pivotal determinants of GWG. Excess GWG is strongly associated with unhealthy behaviors, while adequate GWG correlates with healthier lifestyle practices. These findings emphasize the importance of translating evidence into actionable interventions through targeted health policies and clinical guidelines, including i) integrating nutritional counseling and physical activity promotion into prenatal care; ii) ensuring accessible, equitable maternal health services; iii) raising awareness and providing resources to support healthier lifestyles among women of reproductive age.

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PO3.014

Implementation of 'Grunau Moves' Best Practices in Greece: Health4EUkids Joint Action

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Introduction: Socially determined health inequalities are recognised as an obstacle in preventing childhood overweight and obesity, a growing epidemic, with Greece ranking in the top three European countries (WHO 2022). The highest prevalence of children living with obesity in ages 2 – 14 years is found in 6th Health ADM (18.8%) an area with urban-suburban and rural areas/island and social inequalities. A community-based health promotion and obesity prevention program targeting this population, known as Grunau Moves, was implemented between 2015-2019, in Leipzig, Germany, an area with particular social challenges, and has been categorized in Best Practices.

Methods: We implemented Grunau Moves between September 2023-September 2024 in two primary schools of Patras (the largest capital of 6th Health ADM) situated at the lowest socioeconomic area of the city (pupils N=209, 9-12 years). We followed a participatory development of health promotion measures and the Precede-Proceed model (Green & Kreuter 2005), to assess the predisposing, reinforcing and enabling factors that influence individual behaviours in specific environments. Interventions were designed according to the mapping protocol (Bartholomew LK et al, 2006) aiming individual and environmental changes. We used questionnaires pre- and post-intervention to assess anthropometrics and behaviours (focusing on activity) regarding healthy living in the study population. Throughout the intervention we also provided information on healthy dietary habits.

Results: At baseline, 25.7% of children in total were found living with overweight or obesity; 34.7% in school A and 21% in school B. Additionally, a total of 74.2% reached the goal of >60 min daily outdoor activity & play; 76% in school A and 72% in school B. Regular participation in sports clubs was 11.4% and 47.6% respectively in schools A and B. Interventions performed are presented in Table 1. After the implementation of the 1st year of the intervention the prevalence of children living with overweight or obesity decreased to 18.9% in school A and 20% in school B. Moreover, daily active outdoor play (>60 min) was 84.6% in school A and 87.4% in school B. Regular participation in sports clubs was 40.9% and 53% respectively in schools A and B.

Conclusion: The interim evaluation of the implementation of Grunau moves in Greek children (9-12 years old), from two primary schools in Patras, show promising results following the first year of implementation. Evidence-based behavioural intervention programs are necessary for reducing childhood obesity, especially in socially deprived areas.

Tab. 1. Interventions performed in Patras, Greece following 'Grunau Moves' Best Practices, 2023-2024.

Interventions	Target group	Methods
Movement city map	Students and families	More physical activity (options), setting goals, direct experience, discussion
Monthly poster campaign	Students	Active learning, shifting focus
Motion detector workshop	Students, teachers, school staff	Active learning, direct experience, skills training
Exhibition posters of previous year	Students	Discussion active learning
Nutrition Days	Students and families	Active learning, direct experience
Annual conference	All plus local society	Training, goal setting
Optimization of meal composition	Students, teachers, families	Active learning, skills training
Active to school and back	Students	More physical activity (options)
Soccer/Volleyball cup	Students	More physical activity (options)
Evaluation	All	Questionnaires, anthropometrics, self-reporting

PO3.015

Parents' experiences of having a child with ADHD and obesity - a qualitative study

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Introduction: The prevalence of obesity is 40% higher in children with ADHD (attention deficit hyperactivity disorder) than in those without. In children treated for obesity, 20-50% have ADHD. Symptoms of ADHD such as hyperactivity, impulsivity and inattention, are associated with a high risk of behavioural disorders related to food and eating, resulting in further challenges when managing obesity. Research on the parental perspective of having a child with both ADHD and obesity is limited. Thus, in this study we aim to explore parents' experiences and requests for support when having a child with ADHD and obesity.

Methods: Participants were recruited through an outpatient paediatric obesity clinic in Stockholm, the Swedish patient organization for obesity and through a letter to families that had previously participated in a randomized controlled childhood obesity trial. Telephone-based semi-structured interviews were conducted with eight parents (one father and seven mothers) of children (four boys and four girls) aged 10-16 with ADHD and obesity. Most of the children had been treated for obesity since before they were six years of age. Four had received their ADHD diagnosis before they were 10 and four between 10 and 12 years of age. Five children used medication for ADHD. Four children had a selective eating behaviour. The interviews were recorded, transcribed, and analysed using thematic analysis.

Results: The analysis resulted in two main themes (1) A functioning everyday life and (2) Fighting for children's rights, each with four subthemes. The first theme describes the familial everyday challenges affecting both the child's and the parent's health. The parents described how the child's eating behaviour changed as the child got older, with increased symptoms and drug treatment of ADHD but also due to mental illness. The theme

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also includes the parents' experiences of everyday conflicts and difficulties in communicating with their child as well as and not being understood by those in the child's environment. The second theme describes the parents request for support in how to talk about weight and health with their child and the importance of support taking the specific need of their child into account. Parents described how, currently, the support offered was not tailored to their child, instead the parents needed to be proactive in seeking and coordinating the child's care. The situation described by parents was a reason to why parents rated their own health lower than their child's.
Conclusion: The care for children and adolescents with both ADHD and obesity needs to be improved with increased competence and a broader understanding for both conditions and how they affect each other. Parents ask for a better support in how to handle the child's eating behaviour and how to improve their own communication skills with the child. An improved coordination of care and collaboration between different actors are also necessary to ease the burden on these struggling families.

PO3.016

Metformin intervention in children and adolescents with obesity

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Introduction: Health behavior and lifestyle treatment is the fundament of pediatric obesity therapy. However, to obtain clinical results are difficult and pharmacotherapy is often needed. Metformin is recommended as a treatment option for type 2 diabetes from the age of 10 years, but as of now metformin is not indicated for obesity. Clinical trials with metformin in children with obesity have shown mixed results, depending on dosage and age. Metformin extended release (XR) has shown promising results in adults with fewer side effects.
Methods: A parallel, three-armed (metformin XR plus lifestyle, metformin immediate release (IR) plus lifestyle or lifestyle alone) randomized, 6 months multi-center study was conducted. It included eleven study visits or telephone calls. Children and adolescents aged 6-18 years, with obesity (BMI-SDS >2.0) were included in the study. Subjects randomized to drug treatment received weight-adjusted doses of metformin. Lifestyle modification interventions were given to all participants. The primary endpoint was reduction in BMI-SDS using Metformin XR and lifestyle treatment, compared with lifestyle treatment alone. One secondary endpoint was to evaluate the effect of growth and age on BMI-SDS.
Results: There were 89 subjects randomized and 78 subjects who completed the study. Mean BMI-SDS change from baseline to the end of the study was for the Metformin XR + lifestyle -0,281 (p= 0.006), Metformin IR + lifestyle group -0,280 (p= 0,009), and for lifestyle alone -0,126 (p= 0.359). Reduction in BMI-SDS was greater in the Metformin XR + lifestyle group compared with lifestyle alone (difference between groups 0.132 SD, p=0.02). There were no significant changes in other metabolic parameters between baseline and end of study in any of the groups, besides a reduction in 2-hour insulin in the Metformin IR + lifestyle group. Prepubertal children reduced BMI-SDS more than pubertal and postpubertal children.
Conclusion: Metformin IR and Metformin XR in combination with lifestyle modification interventions lower BMI-SDS and are therefore suitable options for the treatment of pediatric obesity.

Conflict of Interest: None

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PO3.017

Association Between Preconception Paternal Body Mass Index and Offspring Weight Development from birth to five years: Data from the APPROACH Study

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Background: Parental and childhood overweight/obesity are positively associated, with maternal pre-conceptional BMI well-established as a predictor of offspring overweight/obesity. The association between paternal pre-conceptional factors and offspring weight is less known. Parental and childhood overweight/obesity are positively associated, with maternal pre-conceptional BMI well-established as a predictor of offspring overweight/obesity. The association between paternal pre-conceptional factors and offspring weight is less known. This study evaluated associations between paternal pre-conceptional BMI and offspring weight development during the first five years.
Methods: We included 163 offspring from the APPROACH (An optimized programming of healthy children) study and their biological parents. Fathers had a pre-conceptional age of 33.5±5.5 years and a BMI of 27.5±4.5 kg/m2, while mothers were 30.6±4.8 years and had a BMI of 33.9± 3.8kg/m2. Offspring were born at 40.2±1.1 weeks, with anthropometry measured at birth, 6, 18 months, and 3 and 5 years; and fat mass at age five. Linear mixed and regression models were adjusted for gestational age, offspring sex, intervention, gestational weight gain, parity, maternal pre-pregnancy BMI, parental education, and parental age.
Results: Paternal BMI was positively associated with offspring BMI- and weight z-scores (β=0.07, p=0.001; β=0.07, p<0.001), body fat percentage (β=0.30, p=0.026), and fat mass index (β=0.07, p=0.004) at age five. Paternal BMI correlated with offspring length/height z-scores from 6 months to 5 years.
Conclusions: Higher pre-conceptional paternal BMI was associated with increased offspring weight and fat mass at age five, highlighting the potential of improving paternal pre-conceptional factors to reduce the risk of childhood overweight/obesity.

PO3.018

Differences in mealtime eating habits between preschoolers, school-aged children, and adolescents with Autism Spectrum Disorders (ASD)

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Introduction: Youngs with Autism Spectrum Disorders (ASD) face difficulties in eating which seem to diminish during adulthood (Nimbley E et al. 2022).
The present analysis aimed to explore differences in mealtime eating habits between preschoolers, schoolers, and adolescents diagnosed with ASD.
Methods: Eighty-one girls and boys diagnosed with ASD, aged 3 to 18 years old were included in the present analysis. Demographic and anthropometric data of participants and those of their caregivers were collected with self-completed questionnaires administered to the last ones. To assess mealtime eating behaviors the validated Brief Autism Mealtime Behavior Inventory (BAMBI) was used (Lukens CT et al. 2007). The BAMBI consists of 18 questions assessing the mealtime eating behavior of people with ASD (score ranges from 18 to 90, with higher values indicating a more problematic mealtime behavior). For the present analysis, participants

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were grouped into preschoolers (n=32), school-aged children (n=24), and adolescents (n=25) based on their age. The normal distribution of variables was tested with Kolmogorov–Smirnov test. Kruskal-Wallis test was used to explore for between-group differences. All hypotheses were tested at a 5% significance level.

Results: The three groups did not differ in BMI (p= 0.366) or sex distribution (p=0.842). Between-group analysis showed a difference in BAMBI score between the 3 groups with preschoolers scoring higher than school-aged children and adolescents [45.0 (32.0 – 52.0) vs 41.0 (32.5 – 48.8) vs 34.0 (28.0-37.5), p=0.006, respectively]. In specific, the 3 groups differed in the following mealtime behaviors: the child turns his/her face away from food (p<0.001), the child is disruptive during mealtimes (p=0.031), the child closes his/her mouth tightly when food is presented (p=0.007), the child dislikes certain foods and don't eat them (p=0.043), the child prefers crunchy foods (p=0.024), the child accepts or prefers a variety of foods (p=0.031) and the child prefers only sweet foods (candy, sugary cereals) (p=0.024).

Conclusions: The present analysis showed that mealtime eating habits differ between children of different age groups diagnosed with ASD, as those assessed with the BAMBI tool, with preschoolers experiencing the greatest difficulties. From the 18 eating behaviors assessed, six were found to differ between preschoolers, school-aged children, and adolescents, based on caregivers' answers. More research is warranted to verify and further explore these findings.

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PO3.021

Assessing Ventricular Function in Obese Children Using Tissue Doppler Echocardiography: Case-Control study

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Introduction: Childhood obesity is an escalating public health issue linked to an increased risk of cardiovascular diseases and impaired cardiac function. This study utilizes tissue Doppler echocardiography to evaluate the effects of obesity on ventricular function, aiming to identify differences in cardiac parameters between obese children and their healthy peers.

Objective: This study aimed to evaluate the effect of childhood obesity on ventricular function using tissue Doppler echocardiography.

Methods: This case-control study was conducted in the Department of Pediatrics at AVBR Hospital, Sawangi, Wardha. A total of 25 age-matched obese and non-obese children, aged 10-17 years, were recruited. The World Health Organization (WHO) growth reference charts were employed to select cases and controls. A standardized 2D echocardiography along with tissue Doppler imaging was performed on all participants. Mitral flow was analyzed using pulse Doppler, placed parallel to the flow at the orifice of the mitral leaflets. Data analysis was carried out using STATA 12 software.

Results: In the obese group, 56% of the participants were male, while 44% were female. The body mass index (BMI) in the obese group was significantly higher, with a mean value of 29.82 ± 5.76. Obese children demonstrated structural and functional abnormalities in the left ventricle, including increased left ventricular wall thickness, mass, and altered diastolic function, as detected by tissue Doppler imaging. The isovolumic relaxation time (IVRT), a key indicator of left ventricular diastolic function, was 70.10 ± 6.30 ms in the obese group, compared to 56.60 ± 8.08 ms in the control group (p = 0.005). Additionally, the mitral annulus tissue Doppler E velocity was reduced in the obese group, while the flow velocity increased, resulting in a significant reduction in the Em/Am ratio. A significant negative correlation was found between BMI and the LV Em/Am ratio. The myocardial performance index (MPI) was 0.48 ± 0.05 in the obese group and 0.39 ± 0.03 in the control group (p < 0.001).

Conclusion: This study shows that obese children display early, significant changes in left ventricular wall dimensions and diastolic function compared to non-obese children. Tissue Doppler imaging is proven to be a valuable tool in elucidating these cardiac changes.

PO3.022

Weight self-misperception and Obesity-related Knowledge, Attitudes, Lifestyle Behaviors and Cardio-metabolic Markers among Chinese School-aged Children and Adolescents

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Objective: The relationships between childhood weight self-misperception and obesity-related factors particularly health markers have not been extensively dis cussed. This study aims to examine the associations between weight self-misper ception and obesity-related knowledge, attitudes, lifestyles and cardio-metabolic markers among Chinese paediatric population.

Design: Cross-sectional study.

Setting: Data sourced from a national survey in Chinese seven provinces in 2013.

Participants: Children and adolescents aged 5–19 years.

Results: Of the total 14 079 participants, there were 14·5 % and 2·2 % participants over-estimated and under-perceived their weight, respectively. Multi-variable logistic regression was applied to calculate OR and 95 % CI (95 % Cl) of obesity related behaviours and cardio-metabolic markers by actual and perceived weight status. Individuals who perceived themselves as overweight/obese were more likely to have prolonged screen time, insufficient dairy intake and over sugar sweetened beverages consumption (all P < 0·05), regardless of their weight. Furthermore, actual overweight/obese individuals had higher odds of abnormal cardio-metabolic markers, but a smaller magnitude of association was found among weight under-estimators. Among non-overweight/obese individuals, weight over-estimation was positively associated with abdominal obesity (OR: 10·49, 95 % CI: 7·45, 14·76), elevated blood pressure (OR: 1·30, 95 % CI: 1·12, 1·51) and dyslipidemia (OR: 1·43, 95 % CI: 1·29, 1·58).

Conclusions: Weight over-perception was more prevalent than under-estimation, particularly in girls. Weight over-estimators tended to master better knowledge but behave more unhealthily; both weight over-perception and actual overweight/obesity status were associated with poorer cardio-metabolic markers. Future obesity intervention programmes should additionally pay attention to the popula tion with inaccurate estimation of weight who were easily overlooked.

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PO3.023

Childhood body mass index trajectories above average are associated with chronic obstructive pulmonary disease

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Background-Aim: The importance of early life factors for chronic obstructive pulmonary (COPD) disease risk is increasingly being recognized. Although previous studies have suggested a link between body size in childhood and lung function and asthma, the association with COPD remains to be elucidated. Therefore, the aim was to examine if trajectories of body mass index (BMI) in childhood were associated with COPD.
Materials-Methods: We included 276,747 children (137,493 girls) born from 1930–1982, who had 2–12 weight and height measurements between ages 6–15 years from the Copenhagen School Health Records Register. Using latent class trajectory modelling, five distinct childhood BMI trajectories were identified: below-average, average, above-average, overweight and obesity. We followed the individuals from 1977 to 2022 in national health care registers and identified individuals with a diagnosis of COPD from age 40 years onwards. Hazard ratios (HR) and 95% confidence intervals (CI) for COPD were estimated separately for women and men using Cox proportional hazard regression analyses using the individual posterior probabilities of trajectory membership as exposures.
Results: During follow-up, 18,227 women and 15,789 men were diagnosed with COPD. Compared to women with an average childhood BMI trajectory, a higher hazard of chronic COPD was observed for women who had an above-average (HR=1.10; 95% CI: 1.06-1.15), overweight (HR=1.26; 95% CI: 1.20-1.33) or obesity BMI trajectory (HR=1.65; 95% CI: 1.50-1.83). Results were largely similar for men. In contrast, a lower risk was observed for women only with a below average childhood BMI trajectory (HR=0.91; 95% CI: 0.87-0.95).
Conclusion: Having a BMI trajectory above average in childhood may increase the risk of subsequent COPD. Thus, our results suggest that childhood may be a relevant period in relation to the formation of later COPD risk.

PO3.024

Genetic markers of the effectiveness of the standard lowcalorie diet in obese children

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Background: Polymorphism of genes that regulate fat metabolism in obese patients can be considered as of the predictors effectiveness of diet therapy.
Aim: The study was to investigate the genetic predictors of standard low-calorie diet at different polymorphic variations ApoE and LPL genes in obese children.
Materials-Methods: Our study involved 88 obese teenagers aged 15 to 19 years. Study of lipid metabolism includes the determination of total cholesterol, triglycerides, low-density lipoprotein, high-density lipoprotein determined by spectrophotometry and immuno turbidimetry. Analysis of polymorphisms of LPL gene Ser447Ter (c.1595C>G), Cys112Arg (c.388T>C) and Arg158Cys (c.526C>T) of ApoE gene was performed by polymerase chain reaction.
Results: The results show significant differences in the efficacy of diet, depending on the genotype. We found that obese teenagers have significantly higher carrier genotypes c.388 T/T + c.526 C/C (by 20% reduced total cholesterol, b y19% - triglycerides, by20 % - low density lipoprotein, by 16% - high density lipoprotein, and by 9% - glucose), c.388 T/T + c.526 C/T ApoE gene (by 24% reduced total cholesterol, by 20% - triglycerides, and by 2% increased level of highdensity lipoprotein) and C/C LPL gene (by 18% reduced total cholesterol concentration, by 17% - triglycerides, by 16% - high density lipoprotein, by 18% - low density lipoprotein, and by 9% - glucose).
Conclusions: Thus, ApoE and LPL genes alleles can be used as biomarkers of prognosis of efficiency of a standard low-calorie diet therapy in obese children.

PO3.025

Associations between parental procrastination and childhood obesity

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Introduction: While various personality traits have been associated with obesity, the association between parental procrastination and childhood obesity remains unclear. This study aimed to evaluate whether parental procrastination tendencies are associated with obesity in their children.
Methods: In this cross-sectional study, Israeli adults completed an online questionnaire. The analysis included participants aged 24–66 years who were parents of at least one child aged 6-18 years (n = 1,236). Parental procrastination tendencies were measured using the tool developed by McCown, Johnson, and Petzel in 1989. This tool evaluates the frequency in which individuals procrastinate completing daily tasks and consists of 15 items rated on a Likert scale, with scores ranging from 1 (low procrastination) to 5 (high procrastination). Obesity status of children was self-reported by the parents. A multivariable logistic regression model was used to examine the association between parental procrastination and childhood obesity. The model was adjusted for parental age, sex, economic status, number of children, and parental obesity.
Results: Approximately 23.5% of respondents reported having at least one child with obesity. In the adjusted logistic regression model, parental procrastination was significantly associated with childhood obesity (OR 1.80, 95% CI 1.40 - 2.28). Other factors associated with childhood obesity were parental obesity (OR 2.29, 95% CI 1.71 - 3.07) and the number of children in the family (OR 1.15, 95% CI 1.04 - 1.27). No significant interactions were found between parental procrastination and parental sex or age in relation to childhood obesity.
Conclusion: Childhood obesity is significantly associated with higher levels of parental procrastination. These findings suggest that family-based interventions should consider parental procrastination as a contributing factor to childhood obesity.

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PO3.026

Outcome measurement instruments used to measure infant diet, feeding practices and environment, and anthropometric outcomes: A scoping review

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Introduction: Heterogeneity in what and how outcomes are measured in trials of childhood obesity prevention interventions limits evidence syntheses and understanding what interventions work, or not. An infant feeding core outcome set for childhood obesity prevention was developed to address these issues by standardising what is measured in these trials. Identifying how best to measure these outcomes is now needed, the first step to do this is synthesising evidence on how outcomes are currently measured. This review aimed to identify what outcome measurement instruments are used to measure core infant diet, feeding practices and environment, and anthropometric outcomes.
Methods: MEDLINE, CINAHL, EMBASE, PsycINFO, the Cochrane Central Register were searched from inception to September 2023. Database searches were supplemented with reference list screening and crosschecking with two previous reviews of what to measure in this area, as well as the TOPCHILD Collaboration registry of early childhood prevention interventions. Studies were eligible for inclusion if they 1) were randomised controlled trials, 2) included infants ≤ 1 year old who were born > 37 weeks, and 3) measured and reported at least one of 29 outcomes from the previously developed core outcome set. Screening and data extraction were conducted independently in duplicate. Data were narratively synthesised and are presented by outcome grouping (infant diet, feeding practices and environment, and anthropometric outcomes).
Results: Overall the review of what OMIs are being used to measure the COS outcomes has identified 212 OMIs in 157 trials. For diet-related outcomes, 162 outcome measurement instruments were identified in 136 trials. The most used of these were questionnaires (n=64), individual questions (n=44), and food diaries (n=22). For feeding practices and environment outcomes, 18 outcomes were identified in 16 papers. The most used of these were questionnaires (n=10) and individual questions (n=6). Dietary, and feeding practice and environment measurement instruments were most commonly researcher-administered and completed in caregivers homes. For anthropometric outcomes 24 outcome measurement instruments were identified in 71 trials. The most used measurement instruments were weighing scales (n=3) and calipers (n=3). Anthropometric instruments were most commonly administered in person by researchers, clinicians, or healthcare professionals. There was a lack of clarity for many outcome measurement instruments used in terms of what was used, when, by whom, and how.
Conclusion: Review findings highlight the need to improve clarity and completeness of outcome reporting. The findings also provide an important first step to address heterogeneity in measurement of infant diet, feeding practices and environment, and anthropometric outcomes. Consistent measurement of these outcomes is needed to improve synthesis and evaluation of obesity prevention interventions in infancy. These findings will inform development of a core outcome measurement set, including the best quality measurement instruments, to address this issue.

PO3.027

Children and Adolescents with Obesity: A review and Critical Appraisal of Clinical Guidelines

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Introduction: The global rise in childhood obesity requires effective prevention and treatment strategies. Clinical practice guidelines (CPGs) provide guidance, but significant heterogeneity can exist in their content and recommendations. This review aimed to synthesize existing CPGs for childhood obesity prevention and treatment, identify key themes, and address gaps.
Methods: The databases PubMed, Scopus, and Google Scholar were used to identify CPGs on the prevention and/or treatment of obesity in children and adolescents aged 2 to 19 years, with the search conducted up to November 2024. Search terms included: "clinical guideline," "society," "obesity," "overweight," "children," and "adolescents", published in English and developed by a scientific/national society.The information extracted included the assessment of obesity (weight status, health status), lifestyle recommendations (diet, physical activity, sedentary behaviour, and sleep), treatment (drugs, surgery) and the role of parents/guardians in the prevention/treatment of childhood obesity.
Results: 13 CPGs on childhood obesity were analyzed, focusing on childhood obesity prevention (n=10), treatment (n=9), or both (n=6). These revealed heterogeneity in their recommendations. Most prevention CPGs recommended increased physical activity, dietary advice and reduced screen time were commonly recommended, but age-specific guidance was lacking, and recommendations on sleep and mental health counseling were absent. For treatment, BMI was universally recommended for diagnosis, but cut-off points varied. Age-specific comorbidity assessment was lacking. Most CPGs recommended 60 minutes of daily physical activity and limiting screen time to 2 hours/day, but lacked sleep recommendations. Although parental involvement was acknowledged, specific guidance was lacking. Pharmacological treatment options were outdated, and surgery was recommended only in exceptional cases.
Conclusion: Standardization of BMI cut-offs in CPGs is crucial for consistent and comparable management of childhood obesity. It is imperative to urgently expand obesity diagnostic criteria beyond BMI. Tailored age groups interventions for diet, exercise, and sleep are necessary, with a focus on early prevention. Clear guidance for parents, updated information on pharmacological and surgical treatments are essential for effectively addressing childhood obesity and improving the health of young populations.

Conflict of Interest: Authors declare no conflicts of interest.

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PO3.028

Innovation in research co-creation with young people living with obesity: learnings from the ARROWS residential weekend

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Introduction: In England, 2.9% of 4–5-year-olds and 5.8% of 10–11-year-olds are living with obesity. Complications of Excess Weight (CEW) clinics have been commissioned, aiming to deliver holistic multi-disciplinary support to children and young people (aged 2-17) living with obesity and its associated complications. As the CEW clinics are new, their impact is currently being evaluated through the ENHANCE study, which will help inform the evidence base, optimise care, and support future delivery and commissioning. The engagement and involvement of children, young people and their families in ENHANCE is critical. Therefore, this abstract describes the learnings from the innovative approach taken in ENHANCE, to ensure the voices of those with lived experience informs every step of the evaluation process.
Methods: A Patient and Public Involvement group was established as an integral part of the ENHANCE study. This group have called themselves ARROWS, consisting of 10 families who have accessed Complications of Excess Weight clinics in either Sheffield (n=4), Leeds (n=3) or Bristol (n=3). To help build trust, group cohesion and learn from the families' lived experiences and how this can inform the development of the evaluation, a residential weekend was proposed. The ARROWS were involved in planning the residential, which the research team organised. The LUNDY model was used to gage the ARROWS perceptions of their involvement in ENHANCE.
Results: The residential received positive feedback. ARROWS enjoyed the activities and learning new skills. Research-based activities were included and interspaced with team building and bonding activities. Some activities were provided by the venue, including archery, a night walk and fire building. ARROWS further reported gaining personal benefits from attending, including feeling less alone and being able to relate with each other. They also suggested how to improve future residentials e.g., by debriefing after emotional sessions, and ensuring these are run after having some time connect as a group. On average, the ARROWS ranked their satisfaction as eight-out-of-ten i.e., they were very satisfied with the weekend. In terms of their role in ENHANCE, ARROWS rated their role as a six-out-of-eight on the Roger Harts Ladder of young people's participation, meaning they feel ENHANCE is adult led, but with shared decision making with young people.
Conclusions: The residential weekend was a successful way to enable a diverse group of young people to connect, build trust and share learnings. The process enabled the incorporation of the voices of potentially vulnerable people, who may otherwise be isolated and not inform research to such a high caliber. The bonding achieved, both within the group and with the researchers that attended the weekend, may further support the ENHANCE study over its duration, especially as it allowed the researchers to gain a deeper insight into the ARROWS experiences and needs. Therefore, this study provides valuable insights and learnings to improve the meaningful integration of lived experience into future research and evaluation studies.

PO3.029

The Efficacy of a Comprehensive Weight Reduction Intervention in Male Adolescents with Different FTO Genotypes

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Background: The FTO gene polymorphisms may influence the effects of lifestyle interventions on obesity. The present study aimed to assess the influence of the rs9930506 FTO gene polymorphism on the success of a comprehensive weight loss intervention in male adolescents with overweight and obesity.
Methods: This study was carried out on 96 adolescent boys with overweight and obesity who were randomly assigned to the intervention (n = 53) and control (n = 43) groups. The blood samples of the participants were collected and the FTO gene was genotyped for the rs9930506 polymorphism. A comprehensive lifestyle intervention including changes in diet and physical activity was performed for eight weeks in the intervention group.
Results: Following the lifestyle intervention, the BMI and fat mass decreased significantly in the intervention group compared to the control group (Both $P<0.05$), while no change was found in weight, height, or body muscle percentage between the groups. The participants in the intervention group with the AA/AG genotype and not in carriers of the GG genotype had a significant higher reduction of BMI (-1.21 vs. 1.87 kg/m2, $F = 4.07$, $P<0.05$) compared to the control group.
Conclusion: The intervention in individuals with the AA/AG genotype has been significantly effective in weight loss compared to the control group. The intervention had no association effect on anthropometric indices in adolescents with the GG genotype of the FTO rs9930506 polymorphism.

PO3.030

The role of parents' emotional eating and body mass index on parents' feeding practices, happiness, and life satisfaction: analysis in a group of parents of children with mild intellectual disability

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Introduction: Albert Bandura's Social Learning Theory clearly indicates that children learn through observation and imitation of their parents. Such modeling can also be observed in relation to unhealthy eating behaviors, which may be a risk factor for the development of obesity. Moreover, studies show that parents' body mass index (BMI) is strongly associated with their child's BMI, and family-based treatment is the current "gold standard" for treating obesity among children. Importantly, however, there is a lack of analyses regarding families with children with intellectual disabilities. Therefore, the aim of this study is to analyze whether parents' emotional eating and body mass index may play a role in parents' feeding practices (restriction and pressure to eat) towards children with mild intellectual disabilities, as well as in parents' happiness and life satisfaction.

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Methods: Parents (N = 359; Mage = 38.18 ± 6.70) of children (Mage = 10.08 ± 3.83) with mild intellectual disabilities completed: (a) the Child Feeding Questionnaire, (b) the Emotional Overeating Questionnaire, (c) the Scale of Experiencing Happiness, (d) the Satisfaction with Life Scale, and (e) a sociodemographic survey. IBM SPSS Statistics version 29 was used to carry out a two-step cluster analysis (with Schwarz's Bayesian criterion) to identify clusters based on parents' emotional eating and BMI (both variables are continuous). In accordance with WHO guidelines regarding BMI, parents were divided into groups with normal body weight (NW) and groups with overweight and obesity (OO). The cluster analysis indicated four distinct clusters: (a) Cluster 1 (C1; N = 127): low emotional eating and NW; (b) Cluster 2 (C2; N = 91): high emotional eating and NW; (c) Cluster 3 (C3; N = 105): low emotional eating and OO; (d) Cluster 4 (C4; N = 36): high emotional eating and OO.
Results: Referring to the selected results (analyzed using Bonferroni post hoc ANOVA tests), our outcomes showed that C4 (vs. C1) had significantly higher levels of: (a) restriction (MC4 = 3.56 ± 0.82 vs. MC1 = 2.86 ± 1.00, $p < 0.01$), and (b) pressure to eat (MC4 = 3.20 ± 1.05 vs. MC1 = 2.36 ± 1.14, $p < 0.001$). C4 was also characterized by significantly lower levels of happiness (MC4 = 144.92 ± 38.26 vs. MC1 = 188.52 ± 30.01, $p < 0.001$) and life satisfaction (MC4 = 15.58 ± 5.27 vs. MC1 = 22.57 ± 5.02, $p < 0.001$).
Conclusion: Focusing on selected outcomes, the obtained results confirm how important parental functioning can be in shaping eating behaviors in their children with mild intellectual disabilities. Our research allows for a better understanding of the attitudes and experiences of parents of children with intellectual disabilities, which provides the possibility of better designing strategies to support pro-health behaviors in children from this group.

PO3.031

Changes in the Prevalences of Obesity, dyslipidemia and Non-Alcoholic Fatty Liver Disease among Korean Children and Adolescents during the COVID-19 pandemic: Data from the Korea National Health and Nutrition Examination Survey 2017-2021

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Background: In May 2023, the World Health Organization declared a public health emergency of international concern over the global outbreak of COVID-19. It is now important to pay attention to the long-term impact of the COVID-19 pandemic on the health of children and adolescents. AIMS: We aimed to investigate changes in the prevalences of obesity, non-alcoholic fatty liver disease (NAFLD) and dyslipidemia among Korean children and adolescents before and during and after COVID-19 outbreak.
Methods: This population-based study investigated the prevalences of obesity, NAFLD, and dyslipidemia among 3172 children and adolescents between 2017?2019 and 2020?2021. We assessed the prevalences according to body mass index (BMI), age and sex using data from the Korea National Health and Nutrition Examination Survey (KNHANES).
Results: The prevalence of obesity and severe obesity increased from 2.34% and 0.74% to 5.43% and 2.5%, respectively. In age-specific analysis, the prevalence of obesity and severe obesity increased from 1.51% to 6.23% among participants aged 10?14 years and from 5.41% to 10.7% among adolescents aged 15?18 years. Comparison of variables between the before and during COVID-19 pandemic in Korean children and adolescents revealed significant increases in variables associated with metabolism such as liver enzymes, triglycerides, and low-density lipoprotein levels, and a significant decrease in the days of physical activity of 60 minutes or more per days. When comparing patients according to BMI, the prevalence of NAFLD was significantly increased in children and adolescents with normal BMI, almost doubling from 2.35% to 4.58% (p =0.062).
Conclusion: Our results demonstrated the prevalences of obesity, NAFLD and dyslipidemia increased among Korean children and adolescents during the COVID-19 pandemic. Additionally, the prevalence of NAFLD increased among children and adolescents with normal BMI. These results demonstrate the long-term impact of COVID-19 on metabolic disease in children and adolescents and suggest that it may increase the prevalence of NAFLD not only in patients with obesity but also in children and adolescents with normal BMI.

PO3.032

Development of an Internal Clinical Guideline for Pediatric Obesity Management – A Proof of Concept

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Introduction: The objective of this initiative was to develop an internal clinical practice guideline for managing pediatric obesity. This guideline is intended for implementation at Yuno Clinic, an EASO-accredited pediatric medical practice based in Bucharest, Romania.
Methods: The workgroup comprised a multidisciplinary team of medical professionals with expertise in pediatric obesity, including a senior pediatrician specializing in pediatric endocrinology, a senior pediatric endocrinologist, a registered dietitian and nutritionist, a cardiologist, and a psychologist. The team identified key topics and formulated critical questions to guide the guideline's development. They systematically reviewed the literature and integrated their clinical expertise to draft management recommendations. Clinical evidence was derived from recent research and retrospective data collected from the clinic's patient population, focusing on patients with overweight and obesity, excluding those with known genetic conditions. To ensure a structured and transparent grading system for recommendations, the team utilized a framework based on the level of evidence.
Results: Over a 22-month period (February 2023 to December 2024), 2,316 consecutive patients were evaluated at Yuno Clinic. The prevalence of overweight and obesity among these patients was 34.28% (N=794), after excluding patients with genetic traits. Retrospective data collection from these patients revealed an almost equal gender distribution (50.8% boys). A significant proportion of patients were classified as suffering from obesity rather than being overweight (600 with obesity [25.9% prevalence] vs. 194 with overweight [8.3%]), with a median age of 10 years and a median BMI Z-score of 2.33 SD.
Conclusion: This proof-of-concept guideline integrates evidence-based practices and real-world clinical data. It provides a structured approach to diagnosing and managing pediatric obesity, emphasizing the value of multidisciplinary strategies tailored to patient needs. This initiative demonstrates the feasibility and practicality of developing and implementing an internal clinical guideline for managing pediatric patients with obesity within a specialized medical setting.

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PO3.033

Co-designing a web-based program for childhood obesity prevention with culturally and linguistically diverse families

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Introduction: Childhood obesity is a growing public health concern, with its prevention requiring early interventions that establish healthy behaviours in infancy. Culturally and linguistically diverse (CALD) communities face significant disparities in health outcomes that may increase the risk of childhood obesity due to barriers such as language and cultural incongruence. These barriers often impede their access to healthcare services and resources, compelling them to seek online information from unreliable sources. Health resources are commonly not tailored to meet the unique needs of these communities. Addressing these challenges requires innovative and inclusive approaches to developing health resources.
Objective: This study outlines the methodological framework used to co-design an interactive web-based "Healthy Beginnings" early obesity prevention program with Arabic, Mongolian, and English-speaking parents. The framework focuses on health literacy, cultural responsiveness, and user-centred co-design principles.
Methods: A comprehensive, multi-step approach was employed, combining evidence-based content development with participatory co-design processes. Co-design workshops with Arabic, Mongolian, and English-speaking parents focused on four key areas: content, branding, interactivity, and prototypes. Their insights were instrumental in refining the platform's structure, tone, and usability features. The content development process included several steps and multiple tools to ensure accessibility and reduced readability barriers. Evaluations were conducted using a health literacy online guide, Sydney Health Literacy Lab Editor tool to assess readability grade, complex language, and passive voice. Additionally, an Artificial Intelligence tool was used to provide recommendations for structuring and simplifying content. The content underwent multiple rounds of feedback from stakeholders, including parents, health professionals, and editors. Interactive features, such as navigation aids, videos, infographics, and culturally adapted resources, were incorporated into the program to address low literacy levels and enhance usability.
Conclusions: The methodological approach presented in this paper demonstrates the importance of co-design in developing inclusive and culturally responsive digital health programs to prevent childhood obesity among CALD families. It highlights the critical need to avoid assumptions about users' knowledge and to actively engage communities in the design process to create resources that are accessible, relevant, and effective in promoting healthy behaviours to tackle the complex issue of childhood obesity in diverse populations.

Ethics: This project was approved by the Ethics Review Committee (RPAH Zone) of the Sydney Local Health District (X21-0351)

Conflict of Interest: None Disclosed

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PO3.034

Responsive feeding practices in early childhood among culturally and linguistically diverse families

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Introduction: Establishing healthy feeding practices during infancy is crucial for preventing childhood obesity and promoting lifelong health. However, cultural norms and parenting practices often shape feeding behaviours, which can inadvertently contribute to adverse health outcomes. Understanding these practices within culturally and linguistically diverse (CALD) communities is essential for designing effective, culturally responsive interventions.
Objective: This study aimed to explore feeding practices among Arabic and Mongolian-speaking migrant mothers in Australia, with a focus on identifying behaviours that may influence childhood obesity risk and opportunities for developing culturally tailored prevention strategies.
Methods: Semi-structured telephone interviews were conducted in the native languages of 20 Arabic and 20 Mongolian-speaking mothers with children under 2 years old or who were currently pregnant. Thematic analysis, using the Framework Method, was applied to the data.
Results: Both Arabic and Mongolian-speaking mothers exhibited various feeding practices, including responsive feeding or structured schedules. Arabic-speaking mothers were more likely to practice responsive feeding, but formula-feeding mothers in both groups adhered to rigid feeding schedules. During the introduction of solid foods, mothers frequently reported difficulty identifying their babies' hunger and satiety cues, leading to practices that overlooked these cues and often pressured children to finish meals. Arabic-speaking mothers commonly supplemented with formula, citing concerns about breast milk sufficiency, while Mongolian mothers' preference for chubbier babies contributed to pressure-feeding. Across both groups, digital devices were widely used to distract children during meals, resulting in poorer responsiveness to child cues.
Conclusion: These findings highlight the necessity of tailoring future resources and services related to responsive feeding practices to accommodate diverse literacy levels and cultural backgrounds.

PO3.035

Parental Perspectives on a Family-Centered mHealth Intervention Targeting Healthy Habits in Young Children

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Introduction: The family shapes children's lifestyle behaviors, but daily demands can hinder parent participation in positive parenting programs. Mobile health (mHealth) apps offer an alternative to enhance accessibility and adherence to these programs. This qualitative study explored parental perceptions of an mHealth app targeting healthy feeding, physical activity, and screen time parenting practices among families with children aged 2–5 years.
Methods: The Good Start Matters Randomized Control Trial evaluates a 9-module mHealth app designed to support parents in fostering a family environment conducive to lifelong healthy habits. Of the 116 parents randomized to the intervention, 78 who finished the intervention period completed an online survey about their experience in using the app.

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A subsample of 25 parents participated in a 1-hour semi-structured interview. Data were analyzed with thematic content analysis in Nvivo.
Results: Among the 78 parents, 26% did not download the app, 19% completed 1–5 modules, and 55% completed 6–9 modules. Thematic analysis revealed four main themes: 1) Facilitators to App Use: Parents appreciated the app's tracking features, which helped maintain focus and accountability. The app was considered easy to use and appropriate in length, and the content was described as practical and relevant, providing actionable guidance on meal planning, physical activities, and screen-time management. Parents also highlighted the app's non-judgmental tone, which reinforced positive practices without inducing guilt, 2) Barriers to Engagement: Technical issues, including difficulty navigating goal-setting features, occasional glitches, lack of personalization to unique family characteristics, and time constraints were common reasons for low app use, 3) Impact on Family Lifestyles: Parents reported healthier feeding and eating habits, including serving a variety of vegetables, involving children in meal prep, better planning for snacking, and reducing junk food. Families also noted increased engagement in physical activities, including facilitated active play, outdoor time schedules, structured lessons, and family-oriented outdoor activities. Screen-time management also improved, with stricter limits and the removal of screens during meals. Additionally, the app facilitated coparenting alignment, encouraging collaboration and consistent communication about parenting goals while fostering self-reflection, awareness, and positive role modeling, 4) Suggestions for Improvement: Parents recommended increasing personalization to address diverse family needs, such as dual-working parents, single caregivers, and families with neurodivergent children. Suggested enhancements included age-specific content, culturally diverse resources, more indoor activity options, daily tips rather than weekly modules, and a simpler goal-setting interface.
Conclusions: Qualitatively, the mHealth app demonstrated potential to foster meaningful changes in family lifestyle. Future quantitative evaluations are needed to assess the extent to which these perceived effects significantly differ from participants that did not participate in the intervention.

PO3.036

Associations between trajectories of childhood body mass index and infertility in women

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Introduction: Women with overweight or obesity are at greater risk of developing infertility than women with normal weight. As excess adiposity develops over time, we investigated whether trajectories of body mass index (BMI) across childhood were associated with infertility in adult females.
Methods: Based on the Copenhagen School Health Records Register, we studied 135,554 girls born from 1940 to 1996 with information on measured heights and weights from regular health examinations at ages 6 to 15 years. Using latent class trajectory modeling, we identified five distinct classes of childhood BMI trajectories termed below-average, average, above-average, overweight, and obesity. For each girl, the posterior probabilities of belonging to each trajectory were calculated. Infertility diagnoses were identified from several Danish sources, including the Danish Infertility Cohort, the National Patient Register, and the National In Vitro Fertilization Register from 1977 to 2022. Women were followed from ages 20 to 45 years. Hazard ratios (HR) and 95% confidence intervals (CI) were estimated using Cox proportional hazards regression models. Age was used as the underlying timescale, and the analyses were adjusted for educational attainment.
Results: During follow-up, 7,999 (6%) women were identified with infertility. Women with the obesity trajectory in childhood (3%) had higher risks of infertility (HR = 1.26 [95% CI: 1.12-1.43]) than women with the average trajectory (38%), whereas women with the overweight trajectory (11%) did not have increased risks (HR = 1.07 [95% CI: 0.99-1.16]). Similarly, women with below- (22%) or above-average trajectories (26%) in childhood did not have higher risks of infertility (HR = 1.02 [95% CI: 0.95-1.09] and HR = 1.02 [95% CI: 0.95-1.08], respectively), when compared to women with an average trajectory.
Conclusion: Our results suggest that having a consistently high BMI trajectory during childhood is associated with an increased risk of female infertility in adulthood. Thus, our findings indicate that childhood may be an important period of life for the establishment of risks of infertility.

Conflict of Interest: J Baker has received consulting fees from Novo Nordisk A/S. The other authors have nothing to declare.

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PO3.037

Association between BMI and blood pressure among students in grades 3 to 12 in Beijing

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Objective: To explore the association between BMI and blood pressure status among students in grades 3 to 12 in Beijing, China.
Methods: A cross-sectional study was carried out in 5022 students from the nutritional literacy survey conducted in primary and secondary schools in 16 districts of Beijing in 2023. Blood pressure was measured with an electronic sphygmomanometer. The blood pressure status of students was determined according to the "Cut - off values for high blood pressure in children and adolescents aged 7 - 18 years". The Kruskal Wallis test and multinomial logistic regression (adjusting for grades, gender, region, and nutritional literacy level) were used to analyze the relationship between BMI and blood pressure status.
Results: The median systolic blood pressure of the respondents was 111 mmHg, and the median diastolic blood pressure was 65 mmHg. The prevalence of high normal blood pressure and high blood pressure was 19.6% and 10.5%, respectively. Univariate analysis showed that the median BMIs of the three groups with normal blood pressure, high normal blood pressure, and high blood pressure were 19.1, 22.0, and 23.3 kg/m^2 respectively, with significant differences ($H = 542.51$, $P < 0.01$). After adjusting for factors such as grades, gender, region, and nutritional literacy level, the association between BMI and blood pressure status remained significant. The odds ratios (95% confidence interval) for high normal blood pressure and high blood pressure were 1.12 (1.11, 1.14) and 1.19 (1.16, 1.21) respectively.
Conclusion: BMI is a risk factor for high normal blood pressure and high blood pressure among students in grades 3 - 12 in Beijing.

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Tab. 1. Characteristics of Students with Different Blood Pressure Status.

	Normal blood pressure	High normal blood pressure	High blood pressure	Statistical value	P value
SBp (mmHg, M(P25,P75))	107 (100, 112)	121 (120, 125)	128 (123, 135)	H=2748.86	<0.01
DBp (mmHg, M(P25,P75))	62 (60, 68)	70 (64, 75)	75 (69, 80)	H=1161.59	<0.01
BMI (Kg/m2, M(P25,P75))	19.1 (16.8, 22.1)	22.0 (19.3, 26.3)	23.3 (19.9, 27.8)	H=542.51	<0.01
School stages (n, %)				Chi-square=73.31	<0.01
Primary school	1702 (48.5)	269 (27.3)	202 (38.5)		
Midde school	998 (28.4)	333 (33.7)	182 (34.7)		
High school	810 (23.1)	385 (39.0)	141 (26.8)		
Gender(n, %)				Chi-square=72.43	<0.01
Boys	1538 (43.8)	663 (67.2)	271 (51.6)		
Girls	1972 (56.2)	324 (32.8)	254 (48.4)		
District (n, %)				Chi-square=23.97	<0.01
Urban	1822 (51.9)	510 (51.7)	213 (40.6)		
Suburban	1688 (48.1)	477 (48.3)	312 (59.4)		
Achieving nutritional literacy standard	1159 (33.0)	297 (30.1)	155 (29.5)	Chi-square=4.38	0.04

Tab. 2. Multinomial Logistic Regression of Students' Blood Pressure Status and BMI.

	OR (95%CI)	P Value
High normal blood pressure		
Primary school	0.45(0.37,0.54)	<0.01
Midde school	0.75(0.63,0.90)	<0.01
High school	1	
Boys	2.37(2.03,2.77)	<0.01
Girls	1	
Urban	1.11(0.96,1.29)	0.17
Suburban	1	
Not achieving nutritional literacy	0.99(0.84,1.17)	0.90
Achieving nutritional literacy	1	
BMI	1.12(1.11,1.14)	<0.01
High blood pressure		
Primary school	1.20(0.94,1.55)	0.15
Midde school	1.22(0.95,1.57)	0.12
High school	1	
Boys	1.09(0.90,1.32)	0.39
Girls	1	
Urban	0.77(0.63,0.93)	<0.01
Suburban	1	
Not achieving nutritional literacy	1.11(0.90,1.37)	0.33
Achieving nutritional literacy	1	
BMI	1.19(1.16,1.21)	<0.01

PO3.038

Estimating the prevalence of overweight and obesity and the incidence of comorbidities in adolescents living with overweight and obesity: a cohort study using routinely collected healthcare data in England between 2008 and 2023

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Introduction: The Health Survey for England 2022 estimated that in the prior decade 35% of children aged 11-15 years were living with overweight or obesity [1]. Overweight and obesity during adolescence are associated with increased morbidity. We aimed to estimate the prevalence of overweight and obesity among adolescents in England using large routinely collected healthcare data. We also investigated the association between adolescent body mass index (BMI) and the onset of comorbid conditions during adolescence.

Methods: Linked primary (Clinical Practice Research Datalink [CPRD]) and secondary (Hospital Episode Statistics) care data were used. Among adolescents aged 12-17 years registered at a CPRD contributing practice from 2008-2023 with BMI readings and using the UK 1990 growth reference centiles, overweight was defined as ≥91st centile and obesity as ≥98th centile [2]. Three-year rolling prevalence for overweight and obesity were calculated. Adolescents with a healthy weight BMI, ≥2nd-<91st centile, were included as a comparator. The sociodemographic and clinical characteristics for adolescents were described at first BMI recording. The incidence of new comorbidities (Figure 1) during adolescence was compared between adolescents living with overweight or obesity and those with healthy weight using Cox proportional hazards regression.

Results: The period prevalence of overweight and obesity increased from 22% in 2008-2010 to 33% in 2021-2023. Among 139,258 adolescents living with overweight, 140,990 with obesity and 560,789 with healthy

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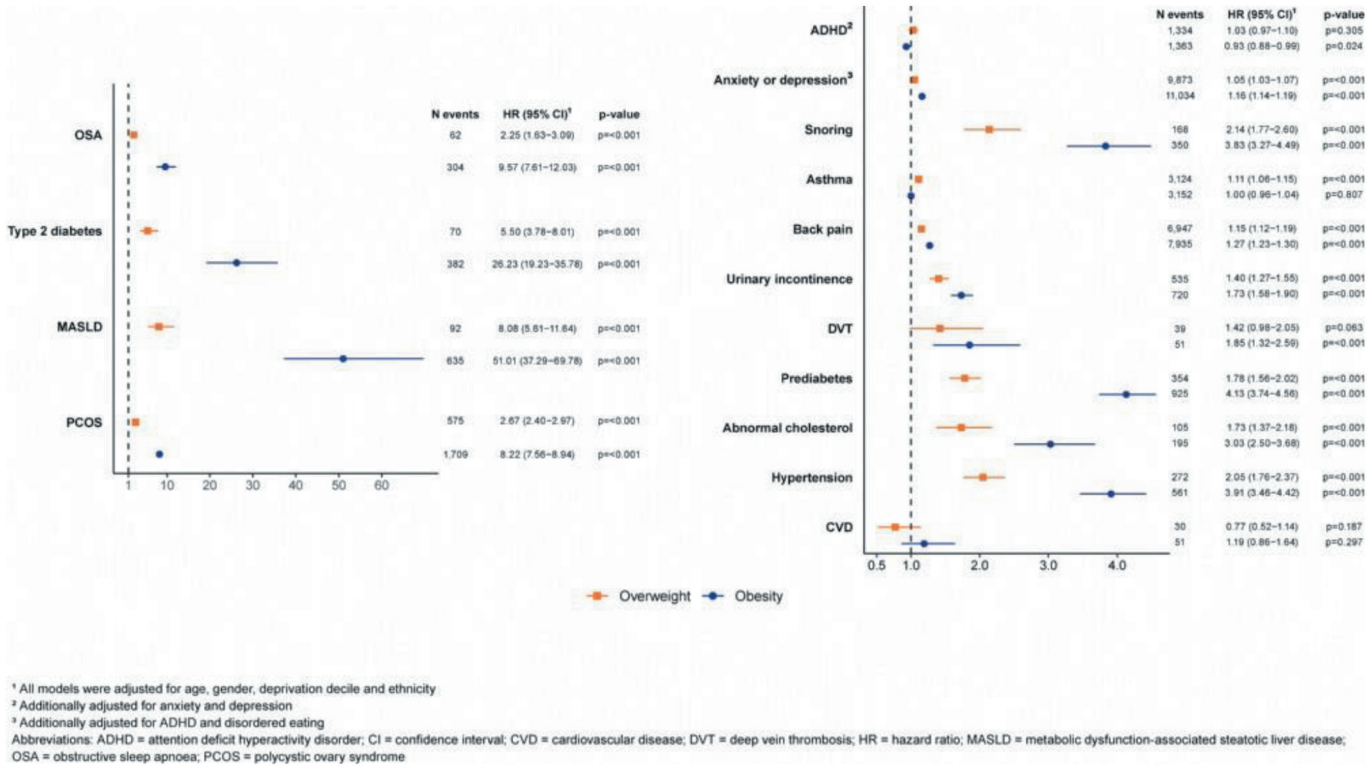


Fig. 1. Association between weight and comorbidities onsetting during adolescence among adolescents living with overweight or obesity compared to adolescents with healthy weight, adjusted Cox proportional hazards regression models.

weight, higher proportions with overweight (26%) or obesity (31%) than healthy weight (22%) resided in the most deprived geographies. Higher proportions of those living with overweight (8%) and obesity (27%) had had obesity during childhood than healthy weight (1%). New onset of mental health (obesity: 8.6% vs overweight: 7.8% vs healthy weight: 7.1%), physical (11.6% vs 10.7% vs 9.3%) and cardiometabolic (3.1% vs 1.2% vs 0.5%) comorbidities during adolescence was higher in adolescents living with obesity than overweight and lowest in those with healthy weight. Out of the 18 comorbidities investigated, the risks of 12 were significantly higher in adolescents living with overweight or obesity compared to those with healthy weight (Figure 1).

Conclusion: The burden of overweight and obesity among adolescents in England is substantial and increased between 2008-2023. In particular, it should be noted that our prevalence estimates use the clinical definition of overweight and obesity, which has higher centile cutoffs than that used for population screening. There is a significantly higher risk of early onset of many, particularly cardiometabolic, comorbidities among adolescents living with overweight or obesity, with risk increasing as BMI increases.

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PO3.039

A 12-month Randomized Controlled Trial Exploring the Effect of Low-Glycemic Index Diets on Obesity Indices and Cardiometabolic Risk Factors in Adolescents with Obesity

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Introduction: Obesity in adolescents is a growing global epidemic. The role of low glycemic index (GI) diet in weight management of adolescents with obesity remains controversial. Here, we aimed to investigate the effects of a low GI diet on changes in obesity indices and cardiometabolic risk profiles among Chinese adolescents with obesity. We hypothesized that low GI diets would result in greater reduction in obesity indices and favorable changes of cardiometabolic risk factors than conventional diets in Chinese adolescents with obesity.

Methods: This was a randomized controlled trial with intervention for 12 months, followed by 6 months of observation. Adolescents aged 15 to 18 years with Chinese ethnicity and body mass index (BMI) ≥95th percentile of Hong Kong age- and sex-specific references were randomized to receive either a conventional diet (55-60% carbohydrate, 25-30% fat and 10-15% protein) or low GI diet (45-50% carbohydrate, 30-35% fat and 15-20% protein) (ClinicalTrials.gov Ref. No: NCT01278563). Three-day diet records were collected to assess the daily nutritional intake, while dietary GI and glycemic load (GL) of participants were evaluated by food frequency questionnaires. Anthropometric measurements, physical activity assessment

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and blood tests were performed at baseline, 6 and 12 months of the study. Total body fat percentage were assessed by bioimpedance (TBF 410, Tanita Corp., Tokyo, Japan), while trunk fat percentage and visceral fat level were assessed by abdominal bioimpedance using ViScan measurement system (Tanita Corp., Tokyo, Japan). Physical activity was evaluated using a validated International Physical Activity Questionnaire (IPAQ). Blood samples were drawn after 8-10 hours of fasting to measure fasting glucose and lipid profiles. The primary endpoint was change of BMI from baseline to 12-month. The secondary endpoints were changes in waist circumference (WC) and body fat percentage from baseline to 12-month.
Results: A total of 285 adolescents were randomized to either conventional (n=142) or low GI diet (n=143) (43% male; mean age 17.2±1.3 years; mean BMI 30.8±4.3 kg/m^2) with 90 participants completed the study at 12-month [n=45 for both conventional diet and low GI diet group (attrition rate: 68.4%); 46% male; mean age 17.2±1.3 years; BMI 30.9±4.1 kg/m^2; WC 92.6±11.3 cm; trunk fat 41.5±7 %; visceral fat level 15±7.7; systolic blood pressure (SBP) 121.6±10.3 mmHg]. There was no significant difference between participants who completed and dropped out. After adjusted for age, sex and physical activity, the low GI group demonstrated significant reductions in BMI, WC, trunk fat percentage, visceral fat level and SBP when compared to the control group (all p <0.05). No significant difference in total body fat percentage, glucose tolerance or lipid profile were detected between groups.
Conclusions: Chinese adolescents with obesity had significant reductions in obesity indices and SBP after intervention with low GI diets when compared to conventional diet. Our findings support the adoption of low GI diets in the management of young individuals with obesity.

PO3.040

The family nutrition and physical activity survey; the relationship between parents and children/adolescents with autism spectrum disorder obesity status

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Introduction: Autism spectrum disorder (ASD) is a permanent neurodevelopmental condition and is regarded as a major public health concern. Children/adolescents with ASD face a greater likelihood of becoming overweight or obese compared to their typically developing peers. Various eating habits, gut mikrobiota, poor sleep quality, lifestyle factors and lack of physical activity contribute to a higher risk of obesity in children/ adolescents with ASD. The aim of this study is to evaluate the relationship between the the family nutrition and physical activity of children/adolescents with ASD, child and parents' body mass index (BMI).
Methods: This cross-sectional study involved children with ASD (3-18 years) who received education at four Special Education and Rehabilitation Centers located in Elazığ, Turkey. The parents of the children/adolescents with ASD completed the following: sociodemographic information, questions about nutrition, and the Family Nutrition and Physical Activity Scale (FNPA) for for evaluating family environment, and combining information from various behaviors associated with childhood obesity. Children/ adolescents' height and weight were used to calculate body mass index (BMI) percentiles. These percentiles for age and sex were used to define overweight and obesity (≥85th and ≥97th percentiles, respectively).
Results: The sample of the study consisted of 80 children with ASD (male: 57, female: 23), of which 31.3% were owerveight and obese. Children/adolescents' BMI percentile, parent's BMI were positively related (p<0.05). A significant negative correlation was found between FNPA score, Children/ adolescents' BMI percentile, and mothers' BMI (p<0.05). FNPA scores were lower in the owerveight/obese group but not significant.
Conclusion: In addition to the many factors that cause obesity, families play a pivotal role in shaping the eating habits and physical activity patterns of children with autism. Understanding the nutritional habits and physical activity levels within the family context is crucial in the prevention of obesity among children/adolescents with ASD.

PO3.041

Novel insights into obesity in individuals with autism spectrum disorder

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Introduction: Autism spectrum disorder (ASD) is a developmental condition that impairs social interaction and communication, typically manifesting within the first three years of a child's life. Different eating rituals, lifestyles, secondary comorbidities, medication use, and physical inactivity increase the risk of obesity in children with ASD. This study aims to investigate the mechanisms of association between obesity and autism.
Methods: The articles of the last 10 years were analyzed by using the keywords 'Obesity'; 'Autism'; 'Obesity and Autism', and 'Obesity in Autism' from PubMed, EBSCO, Scopus and Web of Science databases and the articles found appropriate because of these analyses were included in the study.
Results: In US-based studies, obesity was found to be present in 8-32% of children with ASD. Different studies have shown that children with ASD have an average 1,5-8 times higher risk of obesity compared to children in the general population. In addition, not only obesity that develops in children after birth, but also maternal obesity in the intrauterine period is a condition that affects the risk of autism in the baby. Here, chromosome mutations are thought to trigger the increase in the risk of development.
Conclusion: The prevalence of obesity in children and adolescents with ASD is higher than in the healthy control group. However, a clear study on whether obesity triggers autism or whether autism increases the risk of obesity is insufficient. More studies are needed to elucidate the mechanisms of interaction between obesity and ASD.

PO3.042

Nutritional food situation associated with risk of malnutrition in children under 5 years of age attending Public Health Centers. Rosario. Argentina

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Introduction: The first thousand days of life, from conception to two years of age, are a critical period in which nutrition can influence development and health for the rest of life. Adequate nutrition from the preconceptional stage and continued during the first thousand days of life offers better opportunities for physical and mental growth (Berman Parks et al., 2016). Experiences in the first years of life have persistent, long-lasting, and significant effects in adulthood (Santo y González, 2019).
Material-Method: In order to describe the food-nutritional situation in children under 5 years of age, an observational, descriptive and cross-sectional study was carried out. The population was children under 5 years of age attended in 50 Health Centers. The sample was selected for convenience from a population of 16,000 consultations, which represented 460 surveys. Study variables: anthropometric nutritional status, milk pattern, introduction of complementary feeding, minimum dietary diversity, minimum meal frequency, minimum acceptable diet (according to WHO Indicators, 2009). In children aged 2 to 5 years: frequency of consumption of recommended and non-recommended foods, and type of beverages consumed.
Results: 84% of infants aged 6 to 23 months had adequate weight and 29% were short in height. Of the children aged 2 to 5 years, 41% were at adequate weight, 25% at risk of overweight, and 34% at excess weight. Regarding children under 2 years of age, 38% of children under 6 months consumed exclusive breast milk, 48% partial breastfeeding and 14% only bottle-fed. Only one-third of the population aged 6 to 23 months was fed as recommended for their age. Most of the children started their complementary feeding in a timely manner. 49% of the population aged 6 to 23 months reported maintaining a minimum acceptable dietary diversity.

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58% did not achieve a minimum acceptable diet. The most consumed artificial sugary drinks were powdered juices. Regarding the frequency of consumption of recommended foods in children from 2 to 5 years old, it was observed that 70% consumed fruits at least 1 time a day, 56% consumed dairy products daily, and less than half reported a daily consumption of vegetables and 32% of meats. 25% consumed sweets at least once a day.

Conclusions: The main factors associated with the risk of malnutrition were the frequency of short stature and excess body weight present at an early age, the low rate of exclusive breastfeeding, the low dietary diversity and insufficient frequency of consumption of recommended foods.

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Conflict of Interest: No conflict of interest

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PO3.044

Establishing pathways of therapeutic support for young people with binge eating difficulties in Paediatric Weight Management

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Introduction: Binge eating is characterised by recurrent episodes of eating a large amount of food, often associated with a sense of lack of control, and often followed by feelings of shame or guilt. Binge eating is often a significant barrier to young people achieving weight loss whilst under the care of weight management services. There is currently no published literature around binge eating interventions specifically for young people. Existing screening tools were found to lack sensitivity to measuring quantitative change. An absence of services which offer support specifically for binge eating difficulties for under 18s prompted a tertiary Children and Young People (CYP) weight management service to develop new initiatives to support CYP under its care who experience binge eating. This included the development of a 1:1 therapeutic intervention for managing binge eating difficulties and establishing clear referral pathways with local eating disorder services.

Methods: Regular meetings were arranged with the local Eating Disorder Child and Adolescent Mental Health Service (ED CAMHS) to explore available services, and inform a referral pathway and referral criteria for CYP experiencing binge eating who may be eligible for support from CAMHS. CYP under the care of the Weight Management team suspected of experiencing binge eating were screened using a validated questionnaire. Those found to be struggling with binge eating were offered a 5 session 1:1 therapeutic intervention focussed on understanding and managing binge eating. Parents were offered one individual or group session to support the work with their child. A brief questionnaire has been developed to quantitatively measure the intensity and frequency of binge eating difficulties, before and after therapy.

Results: A pathway was established whereby CYP with high levels of complexity (e.g. comorbid mental health conditions, school refusal) could be referred to CAMHS to receive support. A referral to social care would be considered for CYP with difficulties in the family which could be contributing to their binge eating behaviour. CYP aged 13-17 with binge eating difficulties who didn't meet criteria for CAMHS were offered the 1:1 therapeutic intervention. Between January 2024 and January 2025, 2 young people experiencing binge eating difficulties were referred to CAMHS, 1 was referred to adult mental health services, 3 completed the 1:1 intervention, and 2 started but later opted out of the intervention.

Conclusion: Therapeutic interventions for binge eating for CYP are a necessary part of mental health care and support for CYP accessing weight management services to improve their health. Collaboration with local mental health services has helped to establish mutually beneficial relationships. Discussion focusses on how psychological interventions can be supported by colleagues from the wider Multi-Disciplinary Team (MDT). Learning from the experiences of CYP who completed the 1:1 intervention, and those who did not, will shape further iterations of the programme and contribute to the evidence base to understand the efficacy of interventions for CYP with binge eating difficulties.

PO3.045

The changing trends of hgeight, weight and obesity prevalence among students in Beijing from 2013 to 2021

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Objective: To depict the changes in height, weight, and obesity prevalence among primary and secondary schools students in Beijing from 2013 to 2021.

Methods: Data on the height and weight of male and female students aged 6 to 17 from 2013 to 2021 were obtained through student health

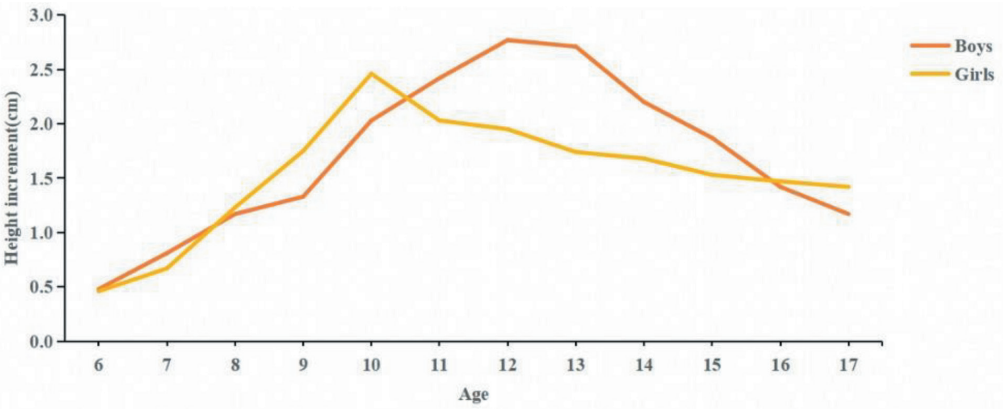


Fig. 1. Height increment of students in Beijing from 2013 to 2021.

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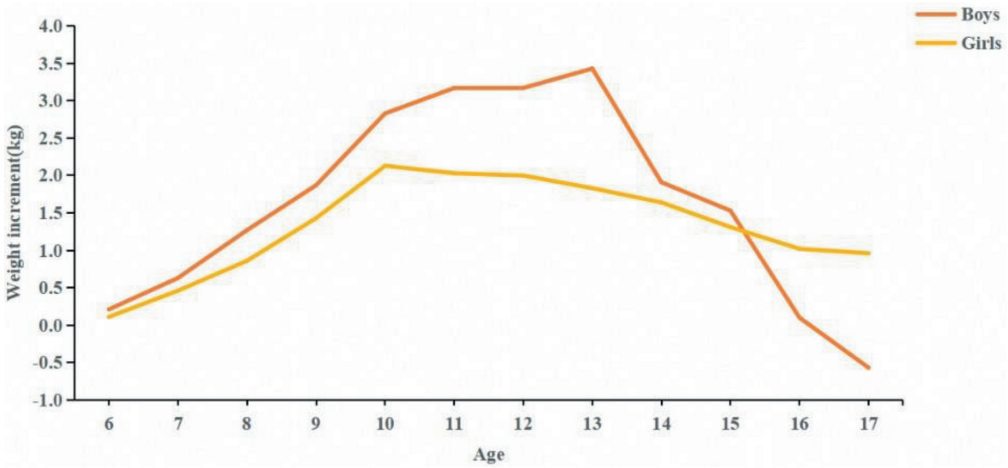


Fig. 2. Weight increment of students in Beijing from 2013 to 2021.

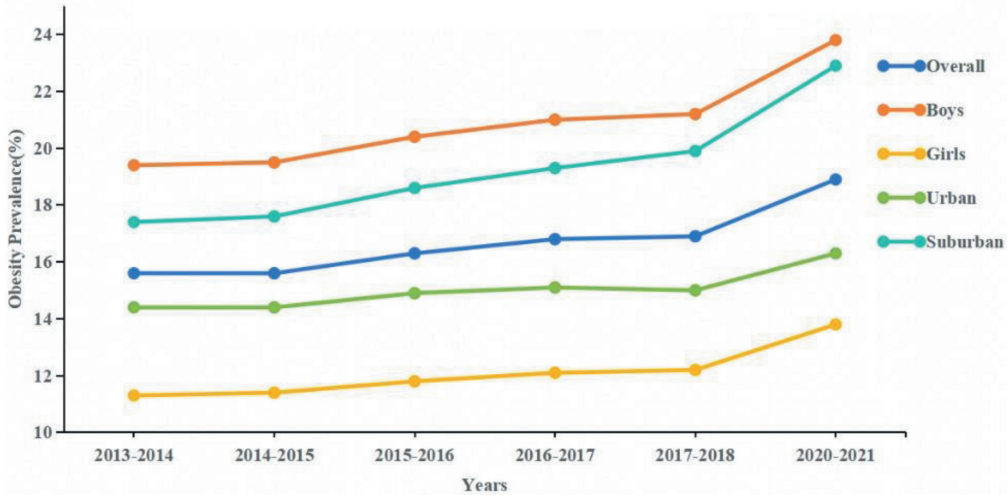


Fig. 3. The Changing Trends of Obesity Prevalence among Students in Beijing from 2013 to 2021.

examination. Obesity was determined according to the age - and gender - specific BMI cut - off values. The overall obesity prevalence of primary and secondary school students in Beijing, as well as those by gender and region, were calculated, and their trends of change were described.

Results: From 2013 to 2021, except for a decline in the weight of male students in the 17 - year - old group, the height and weight of students in other age groups increased to varying degrees. The increment trend of height and weight was that it gradually increased from the age of 6, reached its peak at 10 - 13 years old (for boys, the maximum height increase was in the 12 - year - old group, amounting to 2.8 cm, and the maximum weight increase was in the 13 - year - old group, reaching 3.4 kg; for girls, the maximum height and weight increases were both in the 10 - year - old group, 2.5 cm and 2.1 kg respectively), and then gradually decreased. By the 17 - year - old group, the height increase of male students was 1.2 cm, the weight decrease was 0.6 kg, the height increase of female students was 1.4 cm, and the weight increase was 1.0 kg. Furthermore, the overall obesity prevalence of students steadily increased from 15.6% in the 2013 - 2014 school year to 16.9% in the 2017 - 2018 school year, with an average annual growth rate of approximately 0.3%. Thereafter, the average annual growth rate was approximately 0.7%, and the obesity prevalence reached 18.9% in the 2020 - 2021 school year. Male students, female students, urban students, and suburban students all exhibited similar trends of change. Among them, the obesity prevalence of male students in the 2013 - 2014, 2017 - 2018, and 2020 - 2021 school years were 19.4%, 21.2%, and 23.8% respectively; those of female students were 11.3%, 12.2%, and 13.8% respectively; those of urban students were 14.4%, 15.0%, and 16.3% respectively; and those of suburban students were 17.4%, 19.9%, and 22.9% respectively.

Conclusion: The growth of primary and secondary school students in Beijing have improved, yet greater efforts are required to prevent and control obesity, especially for male students and those in suburban areas.

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PO3.046

Alarming Rise in the Prevalence of Abdominal Obesity among 7-year-old Schoolchildren in Bulgaria

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Introduction: There is a clear trend for aggravation of the childhood obesity epidemic in Bulgaria. Abdominal (central) obesity in children is a global health concern associated with increased risk for an early-onset of complications such as hypertension, dyslipidaemia and hyperglycaemia. The present study aims to assess the temporal trends in the prevalence of central obesity among Bulgarian 7-year-old schoolchildren.
Methods: Five rounds of cross-sectional surveys on nationally representative samples of first graders (7-year-old) in Bulgaria were conducted in 2008, 2013, 2016, 2019 and 2023. In total 15 339 children (50.01% boys) were studied. The research was carried out in strict compliance with the protocol developed by the WHO (World Health Organization) as part of the WHO European Childhood Obesity Surveillance Initiative (COSI). Waist circumference and height were measured by trained examiners with uniform equipment and accuracy to the nearest 0.1 cm. Abdominal obesity was assessed with the indicator waist-to-height ratio (WHtR) and WHtR ≥ 0.5 generally accepted as a universal cut-off for central obesity in children aged ≥6 years.
Results: Within the period 2008-2023 the prevalence of abdominal obesity among the 7-year-old first graders in Bulgaria has almost doubled from 11.9%, 95%CI:10.6-13.2 in 2008 to 20.4%, 95%CI:19.0-21.8 in 2023. At the beginning of the study period in 2008 the prevalence of central obesity among boys was 12.1% 95%CI:10.2-13.9 and reached 20.5% 95%CI:18.5-22.5 in 2023. The prevalence of abdominal obesity among girls in 2008 was 11.8% 95%CI:10.0-13.6 and increased in 2023 to 20.3% 95%CI:18.3-22.3. Although there are no statistically significant differences in the prevalence of central obesity between boys and girls, the number of affected children is alarmingly high.
Conclusion: Within the period 2008-2023 in Bulgaria the prevalence of abdominal obesity among 7-year-old schoolchildren has almost doubled. In 2023 every fifth first grader was with central obesity which further increases the risk for future cardio-metabolic diseases, cardiovascular risk factors and mental health issues. The alarming rise in the prevalence of abdominal obesity calls for the development and implementation of national strategy for combating the childhood obesity epidemic.

PO3.047

Duration of being breastfed in infancy and risks of childhood overweight

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Introduction: Breastfed infants are generally leaner by 12 months of age than those who are formula-fed, and breastfeeding is presumed to have protective effects against childhood overweight. Nonetheless, most studies are prone to bias due to limited control for confounding factors. Moreover, evidence for whether the duration of predominant breastfeeding is associated with risk of overweight in childhood is insufficient. Therefore, the aim of this study was to examine the association between the durations of predominant and any breastfeeding and risk of childhood overweight.
Methods: We included 28,578 Danish individuals (14,137 girls) from the Copenhagen Infant Health Nurse Records born between 1959-67 who underwent health examinations in schools in Copenhagen. The mother reported the duration of any breastfeeding at age 12 months and the feeding intensity (predominant, any, or no breastfeeding) at age 2 weeks and 1, 2, 3, 4, 6, 9, and 12 months. We calculated the duration of predominant breastfeeding from this information. For categorical analyses, the duration of any breastfeeding was divided into five groups (≤0.5, >0.5–1, >1–2, >2–4, >4 months). Childhood heights and weights at age 13 years were retrieved from school health records. Overweight including obesity was classified according to CDC criteria. Risk ratios (HR) and 95% confidence intervals (CI) for childhood overweight risk were estimated by log-binomial regressions with adjustment for sex (basic model) and additionally for birth year, birthweight, preterm birth, maternal education, and the absence of paternal information (adjusted model).
Results: The prevalence of overweight at 13 years was 6.8%. The duration of predominant breastfeeding was inversely associated with risks of childhood overweight in the basic model (HR=0.97 [95% CI: 0.94-1.00, p=0.08] per month) and the adjusted model (HR=0.97 [0.94-0.1.00] per month, p=0.047). The association between the duration of any breastfeeding and overweight was weaker and not statistically significant (HR=0.99 [0.97-0.1.00] per month). In the categorical analyses, compared with individuals who were breastfed for ≤0.5 months, risk of childhood overweight was lower in individuals who were breastfed for longer periods; >1-2 months (HR=0.85 [0.74-0.98]), >2-4 months (HR=0.92 [0.80-1.06]) and >4 months (HR=0.86 [0.75-0.98]). In the adjusted model, the results attenuated slightly, but the trend remained significant (P<0.04). Individuals who were breastfed for >1-2, >2-4 or >4 months had 16%, 10% and 17% reduced risks of childhood overweight (HR=0.84 [0.73-0.97], HR=0.90 [0.79-1.04], HR=0.83 [0.72-0.95]) respectively.
Conclusion: A longer duration and higher intensity of being breastfed in infancy is associated with a lower risk of childhood overweight, also after adjustment for potential confounders. Thus, our results support the evidence that being breastfed for a longer duration has a protective effect against childhood overweight.

Conflict of Interest: Unrelated to this work J Baker has received consulting fees from Novo Nordisk A/S.

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PO3.048

Does Obesity Decrease Lifespan? A Systematic Review

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Obesity has emerged as a major global health concern, with its prevalence rising steadily over the past few decades. Defined as an excess accumulation of body fat, obesity is classified using the body mass index (BMI), with values ≥30 kg/m² typically indicating obesity. It is well established that obesity is a key risk factor for a range of chronic conditions, including cardiovascular diseases, type 2 diabetes, and certain cancers (Ng et al., 2014; WHO, 2021). However, its direct impact on lifespan remains a subject of ongoing debate. While some studies suggest a significant reduction in life expectancy among individuals with obesity (Fontana and Hu, 2014), others point to the influence of confounding factors such as comorbidities, lifestyle, and socioeconomic status (Kitahara et al., 2014). This systematic review aims to synthesise current evidence to clarify whether obesity independently contributes to reduced lifespan.
Objectives: The primary objectives of this systematic review are as follows:
1. To evaluate the association between obesity and reduced lifespan across different populations and age groups.
2. To identify potential confounding factors influencing the relationship between obesity and mortality.
3. To explore the role of obesity-related comorbidities in mediating the impact on lifespan.

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Methods: 1. Search Strategy A comprehensive literature search will be conducted in electronic databases, including PubMed, Scopus, and Web of Science. Search terms will include: "obesity," "lifespan," "life expectancy," "mortality," and "longevity." Additional articles will be identified through manual searches of reference lists from selected studies.
2. Inclusion and Exclusion Criteria
- Inclusion Criteria: Peer-reviewed articles published between 2010 and 2025, studies conducted in humans, articles available in English, and studies reporting on BMI and mortality outcomes.
- Exclusion Criteria: Animal studies, studies without clear definitions of obesity, and articles with insufficient lifespan data.

3. Data Extraction Data will be extracted systematically using a standardised form. Extracted information will include study design, sample size, population demographics, BMI classifications, mortality outcomes, and confounders adjusted for in the analyses.
Population: The population of interest includes adults aged 18 years and older, from diverse ethnic and socioeconomic backgrounds, classified as obese (BMI ≥30 kg/m^2). Subgroup analyses will be conducted for different age groups (e.g., 18-40 years, 41-65 years, and >65 years) and by sex to account for potential variability in obesity's impact on lifespan.
Results: Preliminary findings from the initial screening of studies indicate a consistent association between obesity and reduced lifespan. Additionally, studies highlight the compounding effect of obesity-related comorbidities, such as hypertension and diabetes, in driving the observed reduction in life expectancy (Jia et al., 2019). These findings will be further explored and synthesised in the full review.

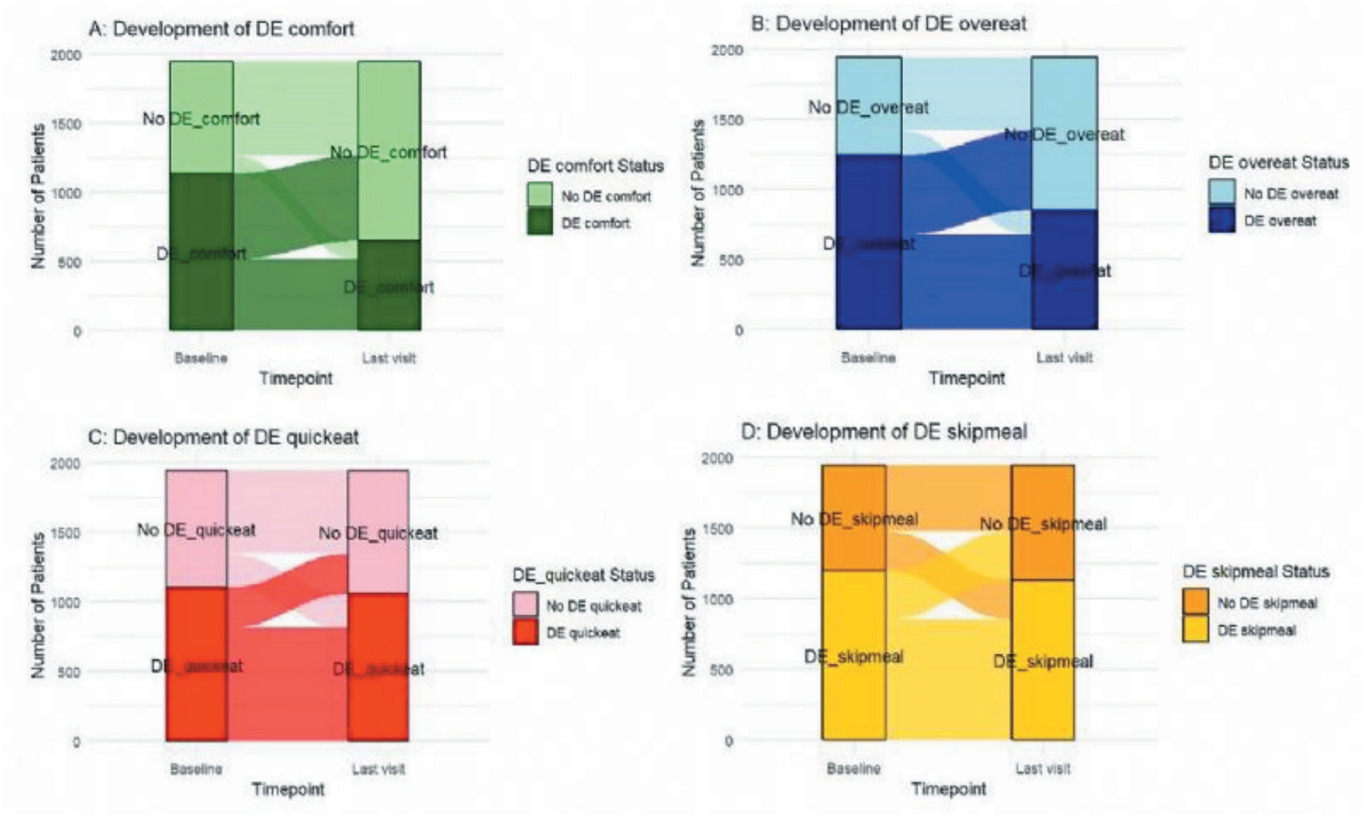
PO3.049

Impact of Non-Pharmacological Obesity Treatment on Disordered Eating in Children and Adolescents

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Introduction: Childhood obesity is associated with an increased risk of developing disordered eating (DE), which further predict weight gain in this population (1). The coexistence of obesity and DE exacerbates physical health complications and psychosocial challenges, making affected children and adolescents particularly vulnerable (2). This study aimed to evaluate whether a hospital-based multidisciplinary non-pharmacological obesity treatment program could improve DE patterns in children and adolescents with obesity.
Methods: This longitudinal observational cohort study included children and adolescents enrolled at the Children's Obesity Clinic, Holbæk



Alluvial plots illustrating changes in disordered eating during treatment

Fig. 1.

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Hospital, Denmark, between 2009 and 2024. All patients were treated using the Holbæk Model, a non-pharmacological, 360-degree, evidence-based approach tailored to each individual. Anthropometric measurements were recorded at baseline and subsequent visits, and DE patterns were assessed through four standardized yes/no questions covering skipping meals, comfort eating, overeating, and quick eating. Assessments were conducted by trained pediatricians or nurses.

Results: A total of 4,029 patients aged 3-18 years were enrolled, 1,948 of these had data from both their initial visit and at least one follow-up visit, including information on DE. At baseline, the median age was 11.5 years, the median BMI SDS was 3.30. A total of 92.9% of patients reported at least one DE trait, while 7.1% exhibited none. The median treatment duration was 2.8 years (95% CI: [2.7-2.9]). During treatment, 10.6% ($p < 0.001$) patients reduced one or more DE traits. At baseline, 58.4% reported comfort eating; of these, 54.6% no longer reported comfort eating at the last visit, while 16.2% developed comfort eating during treatment despite not having it at baseline. Similarly, 63.9% reported overeating at baseline; of these, 45.6% no longer reported overeating at the last visit, while 25.3% developed this trait during treatment. Meal skipping was reported by 61.5% at baseline; of these, 28.7% no longer reported this behavior at follow-up, while 37.3% developed meal skipping during treatment. Lastly, 56.6% reported quick eating at baseline; of these, 26.3% no longer reported this trait at follow-up, while 28.8% developed quick eating during treatment (Figure 1).

Conclusion: These findings suggest that a multidisciplinary, non-pharmacological obesity treatment program can reduce DE traits, particularly comfort eating and overeating, in children and adolescents with overweight.

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PO3.050

Screen time and the association with BMI z-score and metabolic biomarkers in children and adolescents with and without obesity

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Background: Previous studies link sedentary behaviour to body mass and overall health markers(1,2). Screen time serves as a proxy for sedentary behaviour, but most studies are population-based and lack stratification by obesity status. This study investigates associations between screen time, obesity, and metabolic markers in populations with and without obesity.

Methods: This study is based on data from The HOLBAEK Study, gathered from 2006 to 2012. The study population consists of youths (7–18 years) with obesity recruited from the Children's Obesity Clinic, Holbaek Hospital (n=1,127) and youths recruited from schools in Zealand, Denmark (n=329). Data on ST is based on questionnaires regarding hours per day spent in front of a computer, TV, and other digital screens outside school/work. To investigate combined and stratified associations, the study population was divided into a study group with obesity, with a body mass index (BMI) z-score ≥1, and a control group with normal weight (BMI z-score <1). The associations between ST and metabolic markers were analysed using linear regression analyses adjusted for BMI z-score and multiple testing. Differences between the groups were tested using Welch's unpaired t-test, adjusted for multiple testing.

Results: The overall group had a median age of 11 years [IQR 9.0, 13.0]. The study group (n=1,212) had a BMI z-score of 2.86 [IQR 2.4, 3.3], and the control group (n=244) had a BMI z-score of 0.1 [IQR -0.5, 0.5]. The study group had a higher ST (3.5 hours/day [IQR 2.0, 5.0] vs 2.5 hours/day [IQR 1.5, 3.5], $p < 0.001$) than the control group, as well as higher HDL cholesterol (1.2 [IQR 1.0, 1.4] vs 1.6 [IQR 1.4, 1.9] mmol/l, $p<0.001$), higher LDL cholesterol (2.5 [IQR 2.0, 2.9] vs 2.0 [IQR 1.8, 2.3] mmol/l, $p<0.001$), and comparable concentrations of HbA1c (34 [IQR 33.0, 37.0] vs 35.0 [34.0, 37.0] mmol/mol, $p=0.51$). In the regression analysis, there was an overall association between ST, BMI z-score, and HDL cholesterol. When stratifying for obesity, the association persisted in the study group for both BMI z-score ($R^2=0.051$, $p<0.001$) and HDL cholesterol ($R^2=0.075$, $p<0.001$), but the association was no longer evident in the control group for any of the measures.

Conclusion: ST, as a measure of sedentary behaviour, is associated with markers of obesity, including BMI z-score and HDL cholesterol, in children and adolescents with obesity. However, this association is not observed in a control group with normal weight when stratified by BMI z-score. These findings highlight the importance of stratifying groups when examining markers of childhood obesity and health. Further research is needed to explore these associations in greater detail.

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PO3.051

MONUCO: MOnitoring NUtritional COnsequences of Obesity Treatment on women's health and transgenerational effects for healthier future generations – a multi-centre prospective cohort study

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Background and Objectives: In the Netherlands, over 12.000 patients receive obesity treatment annually (e.g., metabolic bariatric surgery or pharmacological treatment), of which the majority (80%) is female. Although these obesity treatments are effective in reducing long-term bodyweight, they also negatively impact nutritional status (vitamins, minerals, but also proteins), which may result in substantial and disbalanced 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

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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 analyzed.
Results: A multi-center 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 centers. Additionally, pregnant women with a history of obesity treatment will also be recruited via obstetricians/gynecologists 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.

PO3.052

Greater adherence to EAT-Lancet Diets in a Pediatric Population with Abdominal Obesity after a lifestyle intervention

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Introduction: Pediatric obesity is a growing global health concern, necessitating effective lifestyle interventions that address both individual health and environmental sustainability. Integrating planetarian dietary practices into obesity management can simultaneously improve diet quality and reduce the environmental impact of food systems. This study evaluates the impact of a lifestyle intervention on adherence to a planetarian diet in children and adolescents with abdominal obesity.
Methods: In a randomized controlled trial, 107 pediatric participants with abdominal obesity were allocated to either a usual care group or an intensive intervention group. The intervention incorporated a moderately hypocaloric Mediterranean diet paired with nutritional education. Adherence to a planetarian diet was measured through the EAT-Lancet Diet Score and the EAT-Lancet Diet Index, alongside assessments of anthropometric and clinical outcomes.
Results: Participants in the intensive intervention group demonstrated significant improvements in adherence to the EAT-Lancet dietary guidelines. This was accompanied by substantial reductions in BMI, weight, and waist circumference, along with enhanced clinical health metrics.
Conclusions: Intensive lifestyle interventions emphasizing planetarian dietary patterns can reduce cardiovascular risk and improve diet adherence in pediatric populations with abdominal obesity. These findings support the dual benefit of such interventions for promoting human health and environmental sustainability.

PO3.054

Healthy Kids, healthy future: preliminary results from the LIVELY project

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Introduction: Obesity, a chronic multifactorial disease influenced by non-modifiable and modifiable factors (PMID: 34311854), has become a pressing public health issue worldwide. Addressing obesity requires a multifaceted approach, particularly as children often grow up in obesogenic environments that shape their behaviors and choices (PMID: 34738306). Schools and families play a pivotal role, acting as both potential barriers and opportunities for fostering healthier behaviors (PMID: 30575570). The LIVELY project aims to assess the prevalence of overweight/obesity in primary school and identify contributing factors within families. Additionally, it focuses on implementing and evaluating a multidimensional, multidisciplinary educational intervention to foster a sustainable and healthy lifestyle.
Methods: The project, led by Istituto Mario Negri and the University of Pavia, ran from October 2023 to October 2024 at the public primary school "Luigi Cadorna" in Milan. It involved class-specific educational intervention on healthy and sustainable nutrition and lifestyle (PMID: 39475855), using lectures, games, and creative activities to engage children and enhance learning and involvement. Families received summary slides after each session. Data on children's anthropometry, lifestyle, and family context were collected via structured questionnaires at baseline (T0) and reassessed at 6 (T1) and 12 months (T2) to evaluate changes linked to the intervention.
Results: The study involved 227 children from 14 classes (mean age 8.9±1.2 years, 48% male). Overweight/obesity prevalence was 24% in males and 23% in females, with central obesity affecting 35% and 36%, respectively. Differences in BMI z-scores, waist-to-height ratios, and abdominal circumference were observed across ethnicities, with higher values in Hispanic and African children. Key changes from T0 to T1 included stable adherence to the Mediterranean diet, increased water consumption, and a rise in both scheduled (66.1% to 71.4%) and unscheduled (82.1% to 85.6%) physical activity, while screen time showed no significant change. Over 55% of children enjoyed the activities, 89% wanted the project repeated, and 83.3% of parents observed a "very positive" impact on their children's health. Most teachers (93.3%) expressed strong support for repeating the project. At T2, an educational assessment questionnaire revealed that over half of the children achieved passing scores, highlighting a clear improvement in their learning outcomes thanks to the intervention.
Conclusions: The LIVELY project highlights the prevalence of childhood obesity in a multiethnic primary school in Milan, reflecting broader demographic changes. It is expected that the project will benefit the enrolled population and succeed in conveying, through a multidisciplinary, multiprofessional and reproducible approach, the basics of a healthy and sustainable diet and lifestyle with the goal of preventing and reducing the prevalence of childhood obesity.

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PO3.055

The Sino-Canadian Healthy Life Trajectories Initiative (SCHeLTI): Design, Implementation, and Compliance with a Large-Scale Obesity-Prevention Intervention Trial

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Introduction: Evidence suggests that life-course interventions starting early in life are essential to addressing the global rise in childhood obesity. However, no scalable, multifaceted obesity prevention intervention exists to support children, mothers, and families from preconception through the first five years of life. The Healthy Life Trajectories Initiative (HeLTI) was developed as an international initiative aimed at curbing childhood obesity through four harmonized randomized controlled trials delivered in healthcare settings in Canada, China, India, and South Africa.
Objective: To review the Sino-Canadian HeLTI (SCHeLTI) intervention trial conducted in China, focusing on its design, theoretical foundations, implementation science strategies, and compliance.
Methods: SCHeLTI is a multi-center, cluster-randomized, parallel-group, superiority trial evaluating the efficacy of an integrated Community-Family-Mother-Child (CFMC) intervention in five districts in Shanghai, China, from either preconception or early pregnancy to the child's fifth year. Participants include 4,405 women (mean age 30.7 ± 3.6) recruited during the preconception (33%) or pregnancy (67%) phase. Maternal and child health centers are randomized and women are assigned into a control group (n=2,422) receiving standard care, or an intervention group (n=1,983) receiving low- or high-intensity intervention based the presence of several childhood obesity risk factors.
Results: SCHeLTI combines evidence-based behavior change techniques, robust implementation science strategies, and principles of successful collective impact initiatives. Key components include: 1) Healthy Conversation Sessions with healthcare providers focused on active listening and open-discovery questions to help women set goals to support healthy family and child habits (e.g., balanced diet, physical activity, reduced screen time); 2) Life Tree Digital Health Platform – a tool for behavioral self-monitoring, growth tracking, and accessing educational resources; 3) Nutritional Counseling – individualized nutritional assessment and advice, 4) Specialized Clinics – obesity and breastfeeding clinics, along with a hotline service for breastfeeding support, and 5) Integration with Existing Health Education Courses offered at participating maternal and child health centers. To support implementation, several indicators are monitored regularly, including intervention delivery, provider-family contacts, quality standards, app usage, and ratio of delivered to planned contacts. Compliance rates ≥80% range from 84–96% in the preconception phase and 90–93% in the pregnancy phase (both completed phases). Ongoing phases report compliance rates of 67–76% (ages 0–3) and 89% (ages 3–5).
Conclusions: SCHeLTI is the first cumulative impact intervention implemented at this scale and for this duration in multi-center healthcare settings. The solid design and high compliance rates so far hold promise in successfully being able to tackle childhood obesity, with intervention efficacy to be determined upon trial completion.

PO3.056

National Czech child obesity Prevention Program BE FIT 24

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Introduction: One of the main causes of obesity, not just for Czech children, is an excess intake of energy combined with low physical activity. In addition to these causes, a lack of awareness and motivation for a healthy lifestyle among both children and parents also plays a negative role. One of the ways to achieve change is a game mechanism based on the principle of positive motivation making use of smart bracelets. This strategy has not yet been utilized in the Czech Republic, but studies confirm that positive motivation leads to better outcomes of preventive measures compared to unmotivated individuals.
Methods: As part of preventive check-ups with a paediatrician, children (n = 1000, age 6 to 11) will be offered participation in a year-long pilot program if the inclusion criteria are met (BMI: 90th–97th percentile). If the parent agrees with their child's participation, the physician will register the child in the BF24 project, give the parent a fitness bracelet, login data for a mobile app and information material on the project.
As part of the year-long game, the child will record their energy intake during the game week (once a month), confirming it in the mobile app with the parent. By connecting with the fitness bracelet, the app will automatically collect data on movement activity and energy expenditure. The child's daily and weekly caloric balance is then assessed on the basis of the values tracked during the game week. If the optimum weekly energy balance is achieved, the child receives one game character. The goal of the game is to reduce one's BMI by 5% and obtain the full number of characters. The app also offers the child nutritional and movement rules through pop-ups. Detailed information is available on the BF24 web portal.
Children included in the program will visit their paediatrician five times to record: weight, height and blood pressure. After one year, the project will be ended and evaluated; the child keeps the fitness bracelet.
Results: The primary measurable clinical objective is reducing the BMI by 5% after a year of participation. In order to check the power of the BMI reduction test, a power analysis and sample size estimation were performed. The premise was reducing BMI by 5%: from an average of 20 kg/m2 (90th–97th percentile) to 19 kg/m2. Hypothetical scenarios of the standard deviation of BMI difference (0.5–3.5 kg/m2) were considered for the planned 1000 children participating. Power of the test (parametric paired t-test at 5% level of significance) including a potential significant expected loss in the individual physician check-ups (expected completion of all check-ups: approx. 450 children): 90%.
Conclusion: Practically verifying the applicability of a mobile application with gamification elements, a fitness bracelet and educational web portal in reducing BMI in a target group of 1000 children. Evaluating the effectiveness of the tested instruments and preventive measures and producing detailed recommendations for implementing a national program for the monitoring and prevention of childhood obesity.

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PO3.057

Weight development in children with obesity without treatment: A Danish cohort study with long-term follow-up

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Introduction: Limited insight exists into the weight development in children with obesity not receiving obesity treatment.
Methods: This cohort study included 467 Danish children aged 5-10 years with obesity (iso-BMI >30 kg/m2) not receiving treatment. Data from mandatory health check-ups on school-children's height and weight (converted to BMI z-scores) were merged with the Danish National Registries. A multivariable logistic regression weighted for the duration of follow-up was used to estimate odds ratios (OR) for normalization of BMI (iso-BMI 18.5-25 kg/m2) and obesity remission (iso-BMI 18.5-30 kg/m2).
Results: During a median follow-up of more than 6 years, 7.9% of the children normalized their BMI, while 45.4% obtained obesity remission. BMI z-score at inclusion acted as a strong inverse predictor for normalizing BMI (OR 0.14 per one-unit SD, CI: 0.03-0.53) and for obesity remission (OR 0.17 per one-unit SD, CI: 0.08-0.37). No other significant predictors were observed in the weighted multivariable models.
Conclusion: Higher BMI z-scores inversely predict normalizing BMI and achieving obesity remission in untreated children. Given that many children naturally achieve obesity remission or weight normalization, resources should focus on understanding barriers of obesity maintenance and to develop effective strategies for those who do not experience improvement.

PO3.058

Prevalence of anorexia nervosa and bulimia nervosa in non-pharmacological childhood obesity management

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Introduction: The association between childhood obesity treatment and the development of anorexia nervosa (AN) and bulimia nervosa (BN) is difficult to determine due to a relative lack of data, pointing to the need of further investigation. Therefore, this study aimed to assess the prevalence of AN and BN in non-pharmacological childhood obesity treatment and compare with a population-based control group, to increase the understanding of the association between obesity treatment and the development of eating disorders.
Methods: This retrospective cohort study included 3,917 participants aged 1-26 years from Children's Obesity Clinic Treatment Clinic at Holbaek Hospital enrolled between 2007 and 2024. The sole exclusion criterion was a registered AN or BN diagnosis prior to enrollment in obesity treatment. A non-selected population-based control group of 3,466 participants aged 2-23 years was included between 2010 and 2022, with no exclusion criteria. Diagnoses were extracted from electronic health records ultimo 2024 and reviewed for the diagnoses of AN (F.50.0, F50.1) and BN (F.50.2, F50.3) classified in the International Classification of Diseases 10th Revision.
Results: In the treatment group one subject was excluded, resulting in 3,916 participants, while all 3,466 subjects were included in the control group. The median age at the time of diagnosis extraction was 20 years for both groups. The prevalence of AN was 0.3% in the treatment group and 0.5% in the control group (P = 0.12), while BN was observed in 0.4% and 0.2% respectively (P = 0.14). The combined prevalence of AN and/or BN was 0.6% in the treatment group and 0.7% in the control group (P = 0.77).
Conclusion: This study found no association between non-pharmacological obesity treatment and the development of AN or BN, in children, adolescents or young adults, when compared with a population-based control group.

PO3.059

Autism in children with obesity: prevalence and associated factors

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Introduction: Childhood obesity is a complex and chronic disease that requires tailored, multidisciplinary treatment. The presence of neurodivergence, such as autism, can create additional barriers and challenges to effective treatment and needs to be taken into consideration when designing interventions for individuals. Rates of obesity are reportedly higher among autistic children compared to neurotypical children (Sammels, Karjalainen, Dahlgren and Wentz, 2022). Studies reporting rates of autism in children living with obesity are rare.
Aims: The current study aims to explore rates of autism in the National Tier 3 multi-disciplinary child and adolescent obesity service in Ireland, to compare these to rates of autism in children in the general population and to explore links between autism and other factors within the sample.
Method: A chart review will be conducted for those who have entered the service over a 1 year period. Presence or absence of an autism diagnosis along with other demographic, treatment and health-related factors will be recorded. Descriptive statistics will be conducted and, where possible, parametric statistics will be conducted for comparison purposes.
Results: The study intends to report the following. Firstly, we will determine the numbers of autistic children presenting to the service over a one-year period. This will be compared to national data to see if rates of autism are higher among those living with obesity. We also aim to explore whether autistic children and adolescents have higher rates of physical comorbidities than those without and to explore any differences in treatment plans between these two groups. If possible, rates of autism will also be compared to data collected from the same service from 2008-2019 (Wyse et al., 2022) to determine whether rates of autism have remained stable within the service over time.
Discussion: The results of this study will be discussed in relation to existing literature about autism and obesity and to aid service planning within the team for these children and their families.

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PO3.060

Association of Fibroblast Growth Factor-21 and Leptin to Adiponectin Ratio with Hepatic Steatosis in Pediatric Obesity

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Introduction: Adipokines secreted by adipocytes and hepatocytes are also associated with fatty liver disease, and the serum fibroblast growth factor 21 (FGF-21) – adiponectin axis has been demonstrated to be related to insulin resistance, metabolic regulation, and obesity. We investigated the association of FGF-21/adiponectin ratio (FAR) and leptin/adiponectin ratio (LAR) with hepatic steatosis in children and adolescents with obesity.
Methods: In this cross-sectional study, a total of 429 children and adolescents with a body mass index (BMI) above the 85th percentile (median age: 11.06 years) were participated. We performed participants' anthropometric measurements, laboratory tests including adipokines, and measured their body composition via whole-body dual-energy X-ray absorptiometry (DXA). Additionally, hepatic fat, visceral adipose tissue area (VAT), and abdominal subcutaneous adipose tissue area were quantified using magnetic resonance imaging (MRI).
Results: Participants with a hepatic fat fraction exceeding 5% exhibited higher BMI z-scores, liver enzyme levels, homeostasis model assessment of insulin resistance (HOMA-IR), lepin and adiponectin levels, FA ratio, and LA ratio compared to the group without. FAR and LAR was significantly correlated with hepatic fat fraction, VAT, fat-free mass index, triglyceride, aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transferase (γ-GT) ($p < 0.05$ respectively). Even after adjustment for BMI z-score and insulin resistance, FAR and LAR showed a significant and independent association with hepatic fat ($\beta = 0.26$ for FAR, $\beta = 0.42$ for LAR, $p < 0.001$ respectively), VAT ($\beta = 0.10$, $p = 0.001$ for FAR, $\beta = 0.14$, $p < 0.001$ for LAR). ASAT was only associated with LAR.
Conclusion: The results of this study suggest that FAR and LAR are significantly associated with hepatic steatosis in children and adolescents with obesity, independent of insulin resistance and obesity status. Therefore, FAR and LAR may be potential biomarkers in pediatric fatty liver disease.

Tab. 1. Association of FAR and LAR with hepatic fat.

	Hepatic fat		
	β	SE	P
Log FAR			
Model 1	0.37	0.076	<.001
Model 2	0.35	0.076	<.001
Model 3	0.27	0.072	<.001
Model 4	0.26	0.071	<.001
Log LAR			
Model 1	0.55	0.063	<.001
Model 2	0.61	0.064	<.001
Model 3	0.46	0.076	<.001
Model 4	0.42	0.076	<.001

PO3.061

Factors influencing use and choice of Core Outcome Sets and Outcome Measurement Instruments in trials of interventions to prevent childhood obesity

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Introduction: Heterogeneity in what and how outcomes are measured in trials of interventions to prevent childhood obesity limits evidence synthesis and understanding of what interventions work, or not. Standardised outcome measurement and reporting across trials, using Core Outcome Sets (COS) and standardised Outcome Measurement Instruments (OMIs), improves examination of intervention effects. Two COS have been developed for childhood obesity prevention and standardised OMI sets for these COS are being developed. For the benefits of COS and OMIs to be realised, they must be acceptable to trialists and used in trials. This study aimed to examine 1)trialists' awareness and attitudes towards existing childhood obesity prevention COS and factors influencing their use, 2)characteristics of OMIs that trialists currently use in childhood obesity prevention trials, and 3)how trialists choose OMIs in trials of childhood obesity prevention interventions and factors influencing those choices.
Methods: An international, online, cross-sectional survey was conducted of trialists (n=46) involved in the design and/or conduct of trials of interventions to prevent childhood obesity and/or enhance health behaviours related to childhood obesity in children 0-5 years. Participants answered closed-ended questions on trialist characteristics, awareness of existing COS and factors influencing their use, OMI characteristics, and factors influencing trialists choice of OMIs. Quantitative data was analysed descriptively.
Results: Eighty-four percent of trialists were familiar with one or both childhood obesity prevention COS. Barriers to using these COS included perceived participant burden, cost, and a lack of knowledge about how best to measure COS outcomes, while guidelines and resources were facilitators of COS use. Trialists most frequently measured outcomes using existing (83%) or adapted questionnaires (80%), and anthropometric measures (80%). OMI type influenced how trialists preferred administering these OMIs. Trialists primarily selected OMIs for use in childhood obesity prevention trials based on OMIs used in other trials (89%), feasibility/pilot studies (83%), and systematic reviews (72%). The most important factors for trialists when choosing OMIs for childhood obesity prevention trials were 1)length of time to complete, 2)content validity, 3) responsiveness, 4)relevance for population, 5)ease of administration, 6) reliability, 7)acceptability to participants, 8)number of items, 9)participant comprehensibility, and 10)criterion validity.

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Conclusions: Trialist-reported factors related to perceived burden, ease and feasibility of OMI use, and key measurement properties such as validity and reliability are important considerations for trials of childhood obesity interventions. Enhancing trialists knowledge through guidelines and resources is key to maximising COS and OMI use in future trials, enhancing evidence synthesis and evaluation of effective of childhood obesity prevention intervention trials.

PO3.062

Families Experiences of mHealth Care in the Treatment of Childhood Obesity – a qualitative study

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Introduction: It is well established that childhood obesity is a common disease, with a world prevalence around 7 % for girls and 9 % for boys. Obesity can lead to serious co-morbidities for the children and adolescents affected. Patients have requested that the care should be digitalized to make it more accessible. Digital obesity care to children and adolescents provides an opportunity for a more equal care, as it is not affected by the family's possibility to travel to their caregiver. The aim was to explore adolescents' experiences of semi-digital care, and what the adolescents value in a digital support tool.
Methods: Semi-structed interviews were conducted with adolescents who participated in a randomized controlled trial, inclusion criteria were obesity according to BMI, age 10-16 and be able to read and speak in Swedish. The intervention group had received an app to support their obesity lifestyle treatment and who had half of their visits digitally. The app included a diary where the participants followed their own personalised behavioural goals regarding diet, physical activity and sleep. The app also included information, a chat and made possible sharing data regarding steps and weight. The data was analysed by thematic analysis with an inductive approach.
Results: 13 adolescents choose to participate in interviews. Three major themes were identified 1) The perceived effect of digital care on combined lifestyle treatment, 2) self-monitoring contributes to an increased awareness regarding one's care, 3) the possibility and challenges with digital care. These themes included thought from the adolescents about the importance of the flexibility and possibility to do individualized adjustments to be helpful but not a burden. The adolescents thought that the self-monitoring using the dairy was a good way to become more self-aware about their lifestyle and that it helped to reach behavioural lifestyle changes.
Conclusion: According to our findings an app and digital care in combination with lifestyle treatment is appreciated by the patients. The adolescent's experience was that the app helped with lifestyle changes and increased self-awareness, however the importance of high level of individualisation was highlighted to reduce the risk of the app to become a negative burden.

PO3.063

Emotional and behavioral risk factors of overweight and binge-eating in Danish (pre-)adolescents

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Introduction: Emotional and behavioral risk factors, such as hyperactivity or emotional dysregulation, have been associated with overweight in children. Overweight is also known to co-occur with binge-eating, even as early as childhood/adolescence. Our aim was to simultaneously and longitudinally examine these relationships between emotional and behavioral risk factors and overweight as well as binge-eating behavior in a community cohort of Danish adolescents.
Methods: Data from the Copenhagen Child Cohort (N=6090, 48.6% female) were used with risk factor assessment taking place at ages 5-7, 11-12 and 16-17 years, weight/height assessment (converted to BMI) at 11-12 and 16-17 years, and binge-eating with experience of loss of control (BE, ever vs. not) assessment at 16-17 years. Emotional and behavioral risk factors were measured with the Strength and Difficulty Questionnaire (SDQ) and completed by parents, teachers, and adolescents. All SDQ subscales were included here comprising prosocial behavior (higher score = positive/less problems), peer relationship problems, hyperactivity/inattention, conduct problems, emotional symptoms (higher score for latter 4 = negative/more problems). Structural Equation Modelling (lavaan package in R) was used to simultaneously test cross-sectional and prospective relationships between the five SDQ subscales, BMI, and BE.
Results: At the age of 16-17 years, almost 1 in 5 adolescents reported having previously engaged in binge-eating behavior. BMI at both timepoints was positively associated with BE. Prosocial behavior at 5-7 years was positively associated with BMI at both later timepoints (11-12 and 16-17 years). Peer relationship problems at 5-7 years were also positively associated with BMI at 11-12 years. While not significant at $p<0.005$, there were trends for hyperactivity/inattention (positive), conduct problems (positive), and peer relationship problems (negative) at 11-12 years to be associated with BMI at 16-17 years; and prosocial behavior at 11-12 years to be negatively associated with BE at 16-17 years. No prospective relationships with emotional symptoms as risk factor were found.
Conclusion: While BMI and BE were positively associated, the emotional and behavioral risk factors observed here were mainly prospectively associated with BMI rather than BE directly. It appears that when all relationships are considered simultaneously, those risk factors reflecting interactions with others (problems with peers such as being bullied, not having a good friend, or prosocial behavior such as sharing, helping, being considerate of other's feelings) play a more prominent role than those often reported in the literature (i.e., behavioral and emotional dysregulation). While we did not examine bidirectional relationships or risk factors and weight development in early life, it might be indicated to strengthen children's interrelationships when considering overweight and disordered eating prevention and do so latest at school-age.

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PO3.064

Increased levels of Syndecan-3 are associated with childhood obesity

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Introduction: Childhood obesity is a significant risk factor for developing obesity in adulthood. Therefore, identifying new biomarkers during this period of life could be essential for enhancing diagnosis and preventing this complex condition. On the other hand, Syndecan-3 (SDC3) has recently emerged as a possible molecular target involved in alterations of energy homeostasis, however its role in childhood obesity remains undefined. We study the metabolic role of the gene SDC3 in children and adolescents with obesity by measuring its mRNA expression levels from peripheral blood mononuclear cells and correlating them with anthropometric and biochemical parameters.
Methods: We performed a cross-sectional study involving 143 Caucasian children and adolescents. The minimum-maximum age range of the participants was 3 to 15 years. They were divided into two groups according to body mass index (BMI). Differences between groups were assessed using mainly the Student's T test and the Wilcoxon test. Correlations between SDC3 mRNA levels and the other variables were analysed by Spearman correlation analysis. The magnitude of these correlations was quantified by multiple linear regression analysis.
Results: The data show increased SDC3 mRNA expression in children and adolescents with obesity, suggesting that SDC3 is implicated in the regulation of obesity. In addition, a positive correlation has been found between the levels of SDC3 with body weight, BMI, BMI Z-score, fat mass, waist circumference, insulin levels, HOMA-IR index and maximum blood pressure. Finally, a multiple linear regression analysis was performed in which the BMI Z-score variable was the most significant.
Conclusion: This study sheds light on the involvement of SDC3 in childhood obesity and proposes an association of this new target with obesity at this stage of life.
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PO3.065

Association between components of metabolic syndrome and diabetic neuropathy in peoples with type 2 diabetes: Results from a National Health Insurance Service–National Sample Cohort, 2015

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Introduction: Metabolic syndrome(MetS) components are are highly prevalent in individuals with type 2 diabetes(T2D). However, the specific relationship between the components of MetS and diabetic neuropathy (DN) remains unclear. This study aimed to investigate the association between the components of MetS and DN in individuals with T2D
Methods: This analysis utilized data from the National Health Insurance Service–National Sample Cohort (NHIS-NSC), focusing on 47,451 patients diagnosed with T2D in 2015. Clinical and demographic factors, including the presence of DN and MetS components, were analyzed.
Results: According to the analysis, 21.6% were diagnosed with DN. Peoples with DN had a higher prevalence of hypertension (84.3% vs. 71.0%), dyslipidemia (86.5% vs. 83.0%), and elevated waist circumference (93.6 cm vs. 80.0 cm) compared to those without DN. Peoples with abdominal obesity in DN showed significantly higher systolic and diastolic blood pressure, fasting glucose and triglyceride and low HDL cholesterol than those without abdominal obesity in DN. These findings highlight the pivotal role of abdominal obesity and dyslipidemia, independent of hyperglycemia, in both the development and progression of neuropathy in individuals with type 2 diabetes.
Conclusions: Peoples with DN had more components of MetS compared with peoples without DN. We suggested a strong association between the components of MetS—particularly abdominal obesity and dyslipidemia—and DN in individuals with T2D.

PO3.066

Effect of the SARS-CoV-2 pandemic on screen time and mobile phone use in children and adolescents in Spain. PASOS Study 2019-2023

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Introduction: Our previous research shows that a prolonged exposure to screen devices is associated with unhealthy dietary patterns, sedentary behavior, and an increased risk of childhood obesity in children and

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adolescents (1,2). The SARS-CoV-2 pandemic, which began in early 2020, disrupted daily routines, including leisure, work, and educational habits. Screen devices, particularly mobile phones, have become more present in the leisure activities of children and adolescents during this period. This study hypothesizes that the pandemic led to increased screen time, especially mobile phone use, among children and adolescents. The objective of this study was to evaluate screen time exposure, with an emphasis on mobile phone use, among children and adolescents in Spain before and after the SARS-CoV-2 pandemic, and to assess whether significant differences in screen time and mobile phone use exist between these two periods.

Methods: A cross-sectional study was conducted at two time points (2019 and 2022-2023) involving 6,158 children and adolescents aged 8 to 16 years, as part of the PASOS Study (Physical Activity, Sedentarism, Lifestyles, and Obesity in Spanish Youth).

Participants were recruited from schools in Spain using a sample design representative of the population. Screen time data (television, computer, video games, and mobile phone) were collected via questionnaires, alongside parental educational level, weight status, and time spent in moderate-to-vigorous physical activity (MVPA). Mean of daily screen time and daily mobile phone use were calculated.

Linear regression models (adjusted for weight status, parental education, and MVPA time) were fitted to evaluate the independent association between the time points (before or after the pandemic) and screen time and mobile phone exposure. The analyses were conducted separately for boys and girls, and for children (8-11 years) and adolescents (12-16 years).

Results: Means of daily screen time and daily mobile phone use before and after pandemic are presented in Table 1.

Screen time and mobile phone use significantly increased after the pandemic among adolescent boys, adolescent girls, and female children. No significant change was observed in boys aged 8 to 11 years. (Table 2).

Conclusions: The behavioural changes following the SARS-CoV-2 pandemic seem to have increased screen time and mobile phone use in female children and in the adolescent population overall. It is necessary to try to limit this exposure to avoid its negative effects on the determinants of childhood obesity.

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Tab. 1. Mean of daily screen time and daily mobile phone use in 2019 and 2022/2023, according to sex and age.

	Total		8 - 11 years				12 - 16 years			
			Boys		Girls		Boys		Girls	
2019	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Daily screen time (minutes)	207.9	143.2	184.1	144.9	124.5	108.6	271.6	144.7	235.0	128.3
Daily mobile phone use (minutes)	72.0	64.2	35.9	48.1	31.0	43.5	94.1	59.8	112.0	58.3
2022/2023	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Daily screen time (minutes)	220.9	146.8	177.5	140.0	147.3	132.1	296.3	142.7	246.2	126.8
Daily mobile phone use (minutes)	81.0	67.6	36.6	49.2	39.0	50.4	110.7	59.4	123.3	57.4

SD, standard deviation

Tab. 2. Effect of the SARS-CoV2 on screen time and mobile phone use in children (8-11 years) and adolescents (12-16 years).

	8 - 11 years			12 - 16 years		
Variables	b	95%CI	p	b	95%CI	p
2022/2023 - 2019. Boys						
Daily screen time (minutes)	-3.24	(-17.89; 12.41)	0.664	22.73	(8.57; 36.88)	0.002
Daily mobile phone use (minutes)	2.12	(-2.88; 7.13)	0.406	16.20	(10.37; 22.05)	<0.001
2022/2023 - 2019. Girls						
Daily screen time (minutes)	24.66	12.11	<0.001	12.78	24.75	0.033
Daily mobile phone use (minutes)	8.79	3.93	<0.001	11.37	16.64	<0.001

Adjusted by parental education level, BMI and Daily MVPA time. b, coefficient of linear regression; p, CI, confidence interval; p value; BMI, body mass index; MVPA, moderate- vigorous physical activity.

PO3.067

Effect of High-Intensity Interval Training on Mental Health in Children and Adolescents undergoing Multidisciplinary Lifestyle Intervention: A Randomized Controlled Trial

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Introduction: Childhood obesity is a major challenge for public health with a wide range of consequences for physical and mental health. Mental health consequences range from psychological distress, and impaired self-concept to mental health disorders, including anxiety and depression. High-intensity interval training (HIIT) has shown positive effects on mental health, but studies investigating children and adolescents undergoing multidisciplinary lifestyle intervention for overweight and obesity are lacking. This randomized controlled trial examined the effect of adding 3 months of HIIT to a 12-months multidisciplinary lifestyle intervention on psychological symptoms in children and adolescents with overweight and obesity.
Methods: The trial included 173 children and adolescents (mean age 12.3±1.7 years, 58 % boys) with overweight or obesity (BMI z-score 2.5±0.6). Participants were randomized to a 12-month lifestyle intervention (N=83, control) or 12-month lifestyle intervention with an additional 12-week HIIT program (N=90, HIIT). The HIIT program included three weekly sessions, targeting intensities above 85% of maximal heart rate. Psychological symptoms were assessed using the Beck Youth Inventories II (BYI-2).
Results: There were no differences in psychological symptoms at 3 or 12 months between the two intervention groups. However, with the groups combined, self-concept increased by 4.4 points (CI: 2.6; 6.2, p≤0.001) at 3 months. Symptoms of anxiety (T-score: -3.7 points (CI: -5.2; -2.3, p≤0.001), depression (-3.6 points (CI: -5.0; -2.2, p≤0.001)) and anger (-2.6 point (CI: -3.9; -1.3, p≤0.001)) were all reduced from baseline to 3 month in the pooled analyses. The changes for self-concept, anxiety and depression were sustained after 12 months. Attendance ≥70% of the HIIT sessions reduced symptoms of anger (p=0.02) at 3 months. Significant correlations between changes in scores of BYI-2 (from baseline to 12 month) and changes in BMI z-score were found for self-concept (r=-0.21; p=0.03), anxiety (r= 0.20; p≤0.05), depression (r=0.22; p=0.03) and anger (r=0.24; p=0.02).
Conclusion: Addition of a 3-month HIIT program to a 12-month multidisciplinary lifestyle intervention, did not further augment improvements in psychological symptoms in children and adolescents with overweight and obesity. However, when the groups were combined, there were significant improvements in mental health after the intervention, and these improvements were maintained after 12 months. Furthermore, improvements in mental health symptoms were correlated with reduction in BMI z-score, highlighting the strong interplay between childhood obesity and mental health. Altogether these results support the positive effect of multidisciplinary lifestyle interventions on mental health among children and adolescents with overweight or obesity.

PO3.068

Vitamin D deficiency in children with obesity: a systematic review of literature

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Background: Vitamin D deficiency is prevalent among children with obesity and may contribute to various metabolic complications. This systematic review evaluates the relationship between vitamin D levels and obesity in children aged 2–12 years, comparing them with healthy peers, and explores the potential role of vitamin D prophylaxis.
Methods: A systematic search was conducted in PubMed for articles published between 2019 and 2024. Inclusion criteria encompassed studies assessing vitamin D levels in children with obesity aged 2–12 years, excluding cases of obesity caused by underlying diseases. Studies focusing on infants and adolescents were excluded. Quality assessment followed PRISMA guidelines.
Results: Fifteen studies were included, with a total sample size exceeding two hundred and twenty four articles. Vitamin D deficiency was significantly more prevalent in children living with obesity compared to healthy controls. The association between lower vitamin D levels and adverse metabolic outcomes, such as insulin resistance and inflammation, was consistent across studies. Prophylactic supplementation of vitamin D showed limited evidence of reducing obesity-related complications.
Conclusion: Children with obesity are at a higher risk of vitamin D deficiency, which may exacerbate metabolic disturbances. Public health measures targeting vitamin D prophylaxis could mitigate these risks. Further research is warranted to establish effective prevention strategies.

PO3.069

Educational Needs for Pediatric Obesity Care Coordinator: Developing Effective Community Based Personalized Obesity Management Program in Children and Adolescents

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Introduction: Childhood and adolescent obesity is an emerging public health problem worldwide, requiring a preventive approach that integrates health systems across the societal levels surrounding each community. In Korea, health care coordinators have been introduced to manage chronic noncommunicable disease such as diabetes. However, field-adaptable educational support for children and adolescents at the national level has been limited and insufficient in addressing pediatric obesity. To enhance the care coordinators' professionalism for children and to improve the effectiveness of obesity management, the development of comprehensive personalized educational and management programs that include nutrition, physical activity, and psychological support is essential.
Methods: A survey on care coordinators to assess the status and educational needs regarding the training for childhood obesity management was conducted to developing an educational program. The survey was distributed to relevant government departments and institutions and conducted online over two weeks. 411 valid responses were selected, from 645 responses total collected, to be analyzed using descriptive statistical methods.
Results: The most of the respondents recognized the necessity of childhood and adolescent obesity management training programs. However, only 14.1% reported having participated in such programs, citing

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challenges; rigid schedules (43.1%), low motivation (25.9%), and insufficient institutional support (24.1%). Respondents emphasized the need to enhance training on lifestyle modification and motivational strategies and preferred more frequent training sessions (3.4 sessions), offline methods facilitated by external institutions (45.7%). Moreover, prior to developing new educational programs, it was emphasized to clearly define the role of care coordinators and increase social awareness of childhood obesity to expand institutional support.
Conclusion: This study confirmed the needs for a comprehensive training program for care coordinators involved in community based personalized pediatric obesity management. It should be specialized with pediatric growth stages and tailored to the professional role.

PO3.070

Is dietary lipid profile affected by sedentary habits and children's eating behavior in young children with overweight/obesity?

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Background: Dietary lipids, sedentary habits, and eating behaviors influence childhood obesity, but their interrelation remains unclear yet.
Aim: To assess the interrelations between dietary lipid profile, eating behavior, and sedentary habits in young children with overweight/obesity. Design: A longitudinal randomized controlled trial on 2-6-year-old children (n=90) with overweight/obesity.
Methods: Dietary lipid profile, eating behavior, and sedentary habits were assessed at baseline and after 9 months using validated tools, including 24-hour recalls, the CEBQ, and screen time questionnaires.
Results: Reductions in weekly screen hours were significantly associated with decreased total fat (-11.1 g/day) and SFA (-4.3 g/day) intake, compared to smaller reductions in unchanged screen hours and increases in prolonged screen use. A positive correlation was observed between changes in dietary fat and the CEBQ domain "Desire to drink" (r=0.528, p<0.001), with regression analysis confirming a direct relationship.
Conclusions: Managing screen time and eating behavior is crucial for improving dietary lipid profile and reducing childhood obesity risk. Strategies should include reducing sedentary behaviors, limiting sugary drinks, and promoting water as the main beverage, alongside effective nutrition education for families.

Funding: This study was funded by EU Horizon 2020 program (grant number: 774548 – STOP - H2020-SFS-2016-2017/H2020-SFS-2017-2). Instituto de Salud Carlos III (CIBEROBN CB12/03/30038), cofunded by the European Regional Development Fund. IDISBA Grants (FOLIUM, PRIMUS, SYNERGIA, and LIBERI).

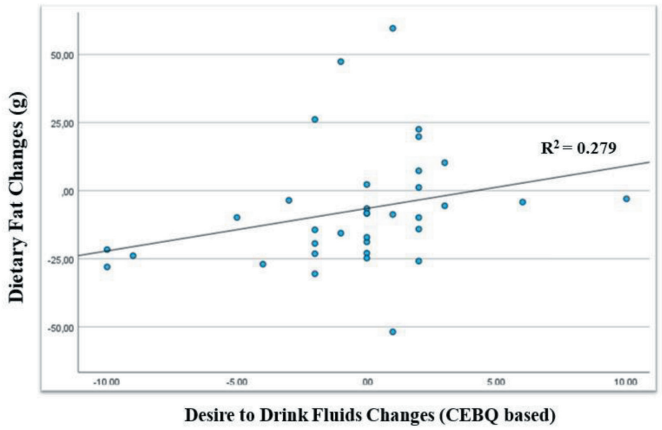


Fig. 1. Scatter plot graphic and regression line between changes in the desire to drink fluids and changes in dietary fat within a 9-month period.

PO3.071

Impact of COVID-19 lockdown on body weight in children: a 4-year follow-up of children during and after COVID-19 lockdown

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Introduction: Obesity and overweight in children were health problems before the COVID-19 pandemic. However, the restrictions introduced during the pandemic exacerbated obesogenic factors, leading to an increase in the prevalence of overweight, obesity and severe obesity in children.
Our study focused on examination of a 4-year follow-up of children within the Childhood Obesity Surveillance Initiative (COSI) project. We compared the prevalence results of excess weight detected in 2022-2024, approximately two years after the lockdown due to COVID-19, with the results from 2018-2019, which preceded the lockdown.
Methods: Between 2019 and 2024, 487 children (244 girls, 243 boys) were examined. They were 7 years old before the COVID-19 lockdown and 11 years old after the COVID-19 lockdown. The data obtained were compared with those of 1321 children (683 girls, 638 boys) examined between 1998 and 2010 at age 7 and then 11 years.
The prevalence of underweight, normal weight, overweight and obesity was assessed according to the WHO methodology. The data were analysed using Statgraphics Centurion, version-XV (p<0.05).
Results: Anthropometric data of children were monitored at 7 years of age and then at 11 years of age. Compared to the period 1998-2008, there were significant shifts in children during the COVID-19 lockdown, mainly from overweight to obese (girls during the COVID-19 lockdown 23.5% vs. 13.4% in 1998-2008; boys during the COVID-19 lockdown 47.8% vs. 15.4% in 1998-2008). Boys also experienced a significant shift to underweight during the COVID-19 lockdown (21.6% during the COVID-19 lockdown vs. 4.5% in 1998-2008).
Conclusions: In the Czech Republic, the first cases of COVID-19 were reported in early 2020, prompting the authorities to impose a lockdown, including travel restrictions and the closures of schools, sports and leisure facilities. The Czech Republic has kept schools closed for the longest of all EU member states. From March 2020 to May 2021, schools were closed for a total of 38 weeks, 18 weeks completely and 20 weeks partially, when only kindergarten and lower school pupils could attend classes.
The effects of the COVID-19 lockdown on school children's weight were both an increase in obesity and an increase in the prevalence of underweight. Boys were the main primary group at risk.
Excess fat mass in children with overweight and obesity can lead to serious health problems in the future, such as accelerated puberty or the development of hypogonadism in boys. Children with underweight may also have health problems such as vitamin deficiencies, anaemia, reduced immune function or growth and development problems.
Supported by AZV NU23-09-00252 and MH-CZ-DRO (EU00023761).

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PO3.072

Prevalence of overweight and obesity among Ukrainian children aged 6-8 years in the context of martial law emergency

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[5]GFA Consulting Group GmbH

Introduction: Overweight and obesity among children remain significant public health challenges, especially during crises when health and education systems are disrupted. In Ukraine, since Russia's full-scale military invasion in 2022, the complex emergency situation created unprecedented conditions, affecting children's physical and mental health. War-related factors hinder effective prevention and management of overweight and obesity, such as logistical disruptions, economic instability, and limited access to balanced diet. This study aimed to assess the prevalence of overweight and obesity among Ukrainian children aged 6–8 years and factors potentially influencing these rates.
Methods: The WHO European Childhood Obesity Survey Initiative (COSI) collects nationally representative data on children aged 6.0–9.9 years. In Ukraine, the COSI study was conducted for the first time and it involved children in grades 1–2, using standardized measurements of height and body weight, and surveys of parents and educational institutions.
Results: The study confirms that overweight and obesity among children aged 6–8 years (n=3557) are prevalent and require systematic investigation and interventions. In this group, 22.96% are overweight (95% CI: 20.55–25.56%; p<0.05), and 8% are obese (95% CI: 7.55–11.00%; p<0.05). Gender differences are significant, with boys showing higher rates: 25.24% overweight and 11.35% obese, compared to 20.72% and 6.95% in girls. Severe obesity was observed in 3.71% of boys and 1.58% of girls. Comparison with average European data reveals similar results.
Geographical differences were found: among urban children, 23.9% are overweight and 9.6% are obese, while in rural areas, these figures are 20.9% and 8.2%. These differences highlight the impact of urbanization and reduced physical activity on health.
Dietary behavior analysis revealed gaps in fruit and vegetable consumption. Only 55.3% of children eat fruits daily, and 41.4% consume vegetables (excluding potatoes). Two-thirds of children consume 1–2 servings daily, with one in five eating fewer than 1 serving. During military aggression, fruit and vegetable intake dropped by 11% and 6.5%, respectively, potentially leading to nutrient deficiencies and harming children's health.
Conclusion: Thus, the combination of socio-economic factors exacerbated during crises may contribute to the increased prevalence of overweight and obesity among children. While the overall rates are relatively low, there is concerning data on low daily consumption fruit and vegetable, which poses a potential health risk. This highlights the need for further implementation of school nutrition programs to mitigate this risk It is also crucial to emphasize the ongoing need for educational activities for parents and children on healthy eating habits, as well as national motivational programs promoting healthy lifestyles.

Conflict of Interest: None Disclosed.

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PO3.073

Prevalence of overweight and obesity in 7-year-old Czech children between 2019-2023

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Introduction: The European Childhood Obesity Surveillance Initiative (COSI) of the World Health Organization (WHO) has been monitoring trends in overweight and obesity since 2007. The COVID-19 pandemic affected people's health around the world between 2019 and 2021. The subsequent lockdown has had an impact on the daily lives of everyone, including children. The aim of the study was to compare the prevalence of overweight in 7-year-old children from 2018- 2020 (5th COSI) and 2022-2024 (6th COSI) and to assess the impact of the COVID-19 lockdown on their development.
Methods: The fifth and sixth monitoring of overweight and obesity in 7-year-old children (6.5-7.99 years) took place in 2019 and 2023, respectively. A total of 2246 children (1105 girls and 1141 boys) were examined in the 5th round and 1122 children (549 girls and 573 boys) were examined in the 6th round of the COSI. Anthropometric data were assessed according to WHO methodology. Analyses were performed using Statgraphics Centurion, version-XV.
Results: 5th COSI round (2019) before COVID-19:

- prevalence of overweight in girls 12.67% (10.76%-14.78%) and boys 12.88% (10.99%-14.97%)
- prevalence of obesity in girls 7.87% (6.35%-9.62%) and boys 10.52% (8.8%-12.44%).
- prevalence of severe obesity in girls 1.81% (1.11%-2.78%) and boys 3.86% (2.82%-5.14%)

6th COSI round (2023) after the COVID-19:

- prevalence of overweight in girls 12.2% (9.58%-15.24%) and boys 9.77% (7.47%-12.5%).
- prevalence of obesity in girls 7.65% (5.57%-10.2%) and boys 9.6% (7.31%-12.31%).
- prevalence of severe obesity in girls 2.73% (1.54%-4.47%) and boys 4.01% (2.56%-5.96%)

The data show that the prevalence of overweight and obesity did not differ significantly between boys and girls during the study periods. The prevalence of severe obesity (SDS BMI ≥3) was assessed separately and showed a slight but statistically insignificant increase during the study period.
Conclusions: In the period between 2020-2021, which included the COVID-19 lockdown, there was a huge increase in the prevalence of overweight and obesity in Czech children, as described by Vážná et al. (doi:10.3390/ijerph191911902). Our results in 2022-2024 suggest that the prevalence of overweight in 7-year-old children is already returning to pre-pandemic levels. Our findings highlight the importance of returning to a healthy lifestyle and incorporating adequate physical activity into a child's daily routine. Supported by AZV NU23-09-00252 and MH-CZ-DRO (EU00023761).

PO3.074

UK Tier 3 Childrens obesity service: Experience of inpatient stay as part of holistic weight management strategy

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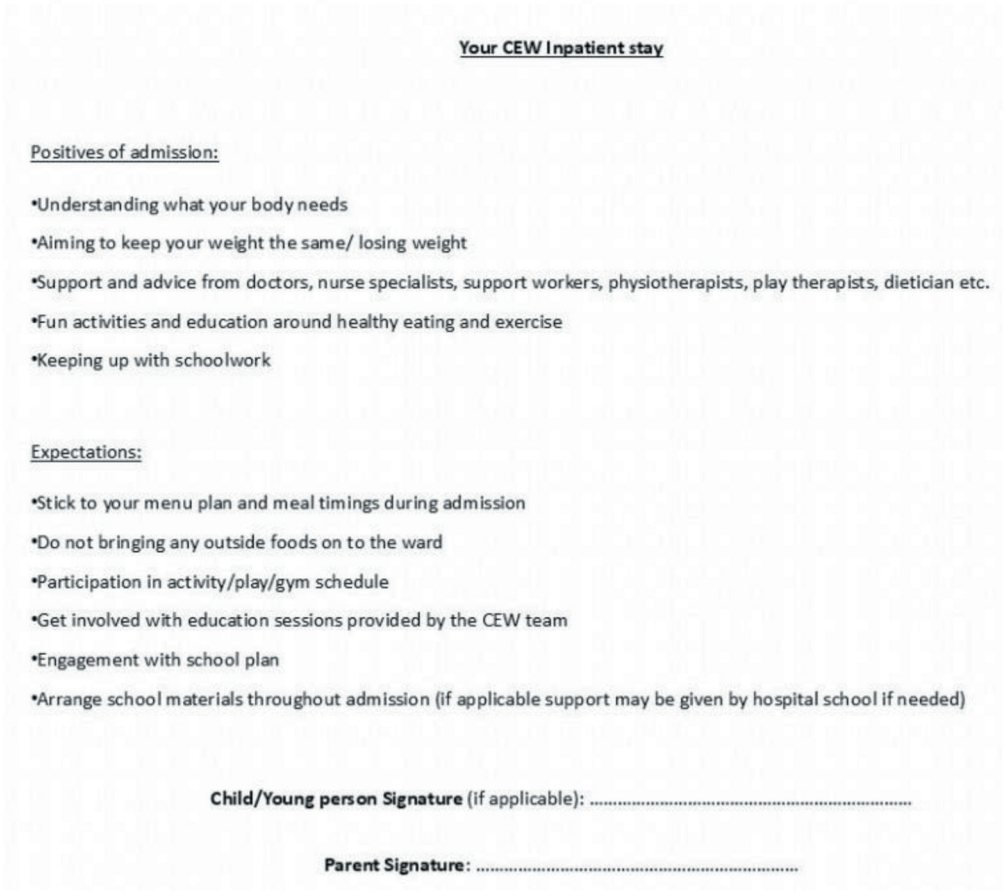
Introduction: Complications of Excessive Weight (CEW) service is a 3-year pilot, funded by NHS England for children and young persons (CYP) aged 1-18 years, living with severe childhood obesity, aiming to reduce associated health complications. Thirty CEW centres in England deliver care using a multidisciplinary team (MDT) approach. Nottingham University Hospitals (NUH) NHS trust began seeing patients in autumn 2021. The CYP are referred from their existing healthcare provider.

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	Plan	Intervention
Pre-Admission	Family to contact ward on evening before admission to confirm bed availability CEW Team: •Add patient to electronic ward diary •Email admission & discharge team •Ward staff to be given patient plan, and follow Robin Hood (children's) menu to be offered •School to be contacted & work allocated appropriately •Refer to systemic psychotherapist and/or youth worker, if appropriate •Family to aim to attend from Sunday evening for Monday ward round with Medical Team	Ward staff to email CEW nursing team when patient arrives on ward
Day 1	Ward nurses: •Supervise food and drink intake •Weight and Height Day 1. Repeat weight Day 5 and discharge. •Ensuring parents/carers are not bringing external food in for patients •Support with holistic needs •Ward staff to contact Paediatric CEW Team if any questions or concerns.	•Ward doctor to complete standard admission clerking •Consider youth worker intervention, if age appropriate. •Dietitian review •CEW team to go through inpatient expectation agreement with the family. •Document to be sign and filed in the notes, uploaded to Diamond database and copy to the family •Daily step counts and /or activities to be discussed
Day 2	Ward nurses to continue with undertaking/supervising: •Food and drink intake with clear documentation •Support with holistic needs	**Consultant review** **AM** – CEW team to give resources and support with educational needs where appropriate. **PM** – CEW to review resources and provide targeted education.
Day 3	Ongoing supervision as above	Review by CEW team: **AM** – CEW intervention *. **PM** – CEW intervention.
Day 4	Ongoing supervision as above	Review by CEW team: **AM** – CEW intervention. **PM** – CEW intervention
Day 5 onwards	Ongoing supervision as above & plan for discharge Prior to discharge Ward Doctors to complete TTO ready for planned discharge	Review by the CEW team and Follow up arranged by CEW. Prepare family for discharge; focus on maintaining healthy lifestyle improvements at home
Please note: The above is a general guide for a stabilisation admission. Timings may vary depending on the CEW teams availability, however, we will aim to cover all key aspects of education throughout the week		

Fig. 1. Image 1-CEW Inpatient Proforma.

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Your CEW Inpatient stay

Positives of admission:

- Understanding what your body needs
- Aiming to keep your weight the same/ losing weight
- Support and advice from doctors, nurse specialists, support workers, physiotherapists, play therapists, dietician etc.
- Fun activities and education around healthy eating and exercise
- Keeping up with schoolwork

Expectations:

- Stick to your menu plan and meal timings during admission
- Do not bringing any outside foods on to the ward
- Participation in activity/play/gym schedule
- Get involved with education sessions provided by the CEW team
- Engagement with school plan
- Arrange school materials throughout admission (if applicable support may be given by hospital school if needed)

Child/Young person Signature (if applicable): .....

Parent Signature: .....

Fig. 2. Image 2 Your CEW Inpatient Stay (family contract).

Tab. 1. Individualised inpatient stay information.

Patient	Age at admission	Sex	Duration of stay (days)	Patient SDS score (prior to admission)	Weight loss (kg)	Percentage of total weight lost	BMI SDS change
1	9 yr 6m	Female	10	3.82	2.5	3.8%	-0.12
2	9yr 3m	Male	9	3.54	1.9	3.1%	-0.1
3	12y 1m	Female	12	4.4	2.8	2.1%	-0.7
4	11y 10m	Female	11	4.4	2.4	1.9%	-0.03

Tab. 2. Selection of Verbal Feedback from Parents about Inpatient stay.

'Portion sizes was eye opening- was giving approximately three times more food at home'
'Good reset-feel more confident in knowing what foods to eat more of and portion sizes'
'Screen time at home approximately 3-4 hours. This reduced to 60 minutes and average daily step count increased from 3000 to 8-10,000 steps.'
''Can walk faster already without getting out of breath'
'Inpatient stay was a waste of time'
'Did not see Dieticians enough (only twice) during stay'

An initial Doctor-led appointment is followed by regular input from the MDT (dietitian, physiotherapist, social-worker and family support worker) with the aim to review patients and families every 8 weeks. Patient led changes in diet, activity and wellbeing are supported by the CEW team with access to medication and management of complications as needed. Children are seen for a period of 12-18 months. The aim is to provide the skills and education needed to maintain positive lifestyle changes beyond their time in clinic.

An inpatient stay, with intensive support and education, is offered to patients with difficulty achieving weight stabilization or demonstrating weight gain where the cause is unclear, or those with safeguarding concerns. The patient selection process by the MDT gives special

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consideration to family circumstances, and children or families with additional needs. A bespoke package has been created to support the inpatient stay (see Image 1).
Methods: The Patient is admitted for 10-12 days to a designated ward in the Children's hospital with the bed allocation opposite the nursing station. One family member can stay overnight with the child if required. The parent and CYP sign a contract that checks understanding of the process and outlines expectations (See Image 2).
Results: Four children, with mean decimal age 10.9, completed an inpatient stay in 2024. Average (mean) length of stay was 10.5 days. The mean BMI Standard Deviation Score (SDS) for the patients is 4.04.
Conclusion: All patients lost weight during their admission. The families received healthy eating advice, exercise information, and were shown examples of healthy balanced meals and portion sizes. The children were encouraged to exercise, and this showed the parents how capable the children were and that weight loss was possible. Feedback was generally positive but also highlighted lack of parental knowledge and limited MDT capacity.
Limitations include difficulties with availability of healthy menu choices on hospital menus (which contain multiple items of calorie dense, ultra-processed choices), insufficient documentation, prioritizing elective inpatient stays on busy wards, parental buy in for an inpatient stay and MDT capacity.

PO3.075

Determinants of Exclusive Breastfeeding Initiation and Continuation through the first month: Health4EUkids Pilot Study in Patra, Greece

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Background: The World Health Organization (WHO) and UNICEF recommends Exclusive Breastfeeding (EBF) within the first hour of birth through 6 months, for optimal health and disease prevention. Although in many countries, a significant 10% increase has been achieved, in Greece EBF remains extremely low, especially in terms of duration.
With this study we aimed to assess the main determinants that may affect intent to EBF (type and duration) and how this can be altered for women who receive support and specific training from an experienced lactation agent.
Methods: We included all women residing in Patras, Greece, in their third trimester, who consented after we thoroughly informed them on the purpose of the study intervention. At baseline, the lactating agent conducted small groups workshops on BF benefits from the 1st hour. The agent emphasized on technical aspects of BF preparation before birth, and after by birth type especially on techniques following a C-section. At birth, the lactating agent visited each woman and provided them with further on-site support. They were asked to complete the baseline questionnaire within a week of birth, which included sociodemographic and anthropometric information and a validated Infant Feeding Intention (IFI) questionnaire that uses a 1 to 5 Likert scale; 1 meaning strongly disagree and 5 strongly agree (range from 1-25). We ensured that all women were followed-up at 2 weeks and 1-month (will also be at 3 and 6) months postpartum, where the lactating agent reviewed specifics on BF according to personalized challenges and difficulties expressed by the woman. At 1 month they also completed a follow-up questionnaire, consisting of 4 main questions related to EBF, and difficulties and barriers being faced.
Results: We recruited a total of 115 women, 90 of which had reached the 1st month, but 18 decided to drop out of the program (19.5% attrition, n=1 due to postprandial depression). The majority of deliveries in our study were by C-section (72.2%) irrespective of medical history, BMI-status, and other variables (Table). We observed that a total of 72 women responded to the 2nd questionnaire and were included in our analysis and obseved significant increase of EBF at 1 month (83.3% of EBF at 1 month, compared to 79.2% at baseline). Specifically, 15.3% of women who did not intend to EBF actually managed to do so, while 11.1% that had intended to finally used complementary feeding. The presence of reported barriers (n=17 in total) significantly differed (18.2% compared to 75%, respectively). The most commonly reported difficulties and barriers reported were "latching on" (47%; 8/17) and "insufficient milk" (35.3%; 6/17).
Conclusion: Despite the high percentage of C-sections, the majority of the women in our study managed to EBF up to the 1st month. Our findings underline the need to increase skills in addition to knowledge and provide personalized support. Follow-up results at 3 and 6 months will offer further insights.

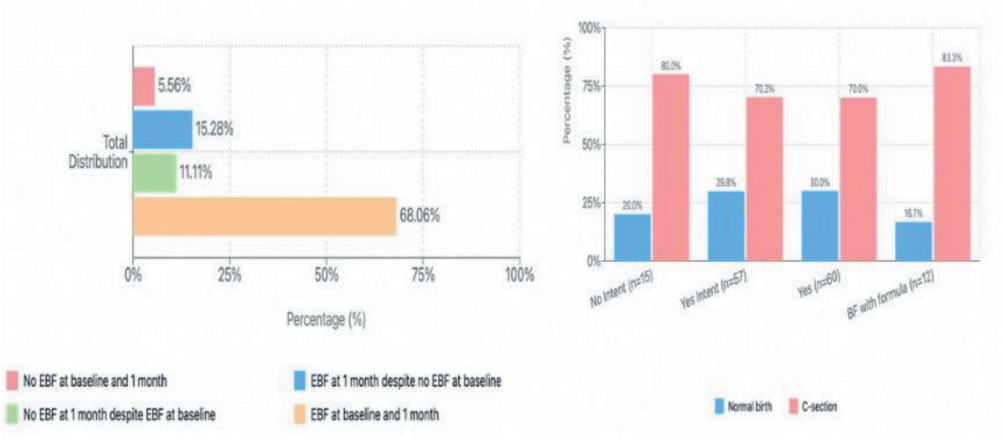


Fig. 1. Distribution of EBF intent at baseline and actual at 1 month in total and by Delivery method.

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Tab. 1. Main characteristics of women included in the study, in total and by birth type.

	Total N= 72	Normal birth N= 20 (27.8%)	C-Section N= 52 (72.2%)	Test
Age, mean (sd)	32.0 (4.7)	30.6 (5.3)	32.5 (4.4)	
Family size, mean (sd)	3.4 (0.7)	3.4 (0.6)	3.4 (0.7)	0.983
Educational level, N(%)				0.836
Up to middle school and private college	31 (43.1%)	9 (45.0%)	22 (42.3%)	
University degrees	41 (56.9%)	11 (55.0%)	30 (57.7%)	
Employment status, N (%)				0.452
Employed in Private sector	33 (45.8%)	9 (45.0%)	24 (46.2%)	
Employed in Public sector	14 (19.4%)	4 (20.0%)	10 (19.2%)	
Free lancer	6 (8.3%)	1 (5.0%)	5 (9.6%)	
Homemaker	6 (8.3%)	1 (5.0%)	5 (9.6%)	
Unemployed	9 (12.5%)	2 (10.0%)	7 (13.5%)	
Part-time employed	1 (1.4%)	1 (5.0%)	0 (0.0%)	
University Student	3 (4.2%)	2 (10.0%)	1 (1.9%)	
Marital status, N (%)				0.532
Single	2 (2.8%)	1 (5.0%)	1 (1.9%)	
Married/Cohabiting	68 (94.4%)	19 (95.0%)	49 (94.2%)	
Other	2 (2.8%)	0 (0.0%)	2 (3.8%)	
Smoking status, N (% yes)	10 (13.9%)	1 (5.0%)	9 (17.3%)	0.176
Smoking status during gestation, N (% yes)	6 (54.5%)	1 (100.0%)	5 (50.0%)	0.338
Alcohol intake during pregnancy, N (5, yes)	2 (2.8%)	0 (0.0%)	2 (3.8%)	0.374
Medical status, N (%)				0.688
None	52 (72.2%)	15 (75.0%)	37 (71.2%)	
GDM	8 (11.1%)	3 (15.0%)	5 (9.6%)	
HTN during gestation	2 (2.8%)	0 (0.0%)	2 (3.8%)	
Other	10 (13.9%)	2 (10.0%)	8 (15.4%)	
Have previously followed a BF education program, N (%)	9 (45.0%)	26 (50.0%)	35 (48.6%)	0.704
IFI scale, mean (sd)	19.4 (3.1)	19.9 (3.4)	19.2 (3.0)	0.399
Benefits of Breastfeeding score, mean (sd)	32.4 (2.8)	32.1 (3.6)	32.5 (2.5)	0.628
Barriers to Breastfeeding score, mean (sd)	18.9 (5.3)	19.1 (5.3)	18.9 (5.3)	0.867

Student t-test for between group differences in continuous variables Chi-square test for between-group differences in categorical variables; Exact Fisher test for cells with frequencies <5 C-section: Cesarean section; IFI: Infant Feeding Intention scale; sd: Standard Deviation; HTN: with Hypertension; GDM: with Gestational Diabetes Mellitus

PO3.076

Not for children's ears? Parents recall childhood obesity treatment for their young children

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Introduction: Interactions with healthcare professionals (HCPs) play a crucial role in parents' engagement during childhood obesity treatment. However, limited research has explored parents' experiences with HCP communication in this context. This study examines how parents of young children with obesity perceive healthcare interactions during treatment, addressing two questions: 1. How do parents experience interactions with HCPs during visits regarding their child's weight? 2. What are parents' approaches towards their child being present during weight-related discussions?
Methods: This qualitative study draws on data from the More and Less Europe study, a randomized controlled trial evaluating a parent support programme as treatment for children (aged 2–6 years) with overweight or obesity in Sweden, Romania, and Spain. Semi-structured interviews were conducted with 45 Swedish parents (71% mothers, 60% with a university degree, 51% with a foreign background) of 45 children (mean age 7.1 years, SD 1.3; 76% girls) who received standard treatment at outpatient paediatric clinics. The interviews were transcribed verbatim and analysed thematically.
Results: Two main themes, each encompassing three subthemes, emerged from the analysis. The first theme, Support and Blame, included the subthemes: Validating Family-Centredness, Overly Generic Advice, and

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Stigma and the Sense of Failing. Parents shared positive examples of supportive HCP interactions but also described disappointment with generic advice and a lack of effective support. Some parents recalled instances of overt stigma, often expressed in the presence of their child, which heightened concerns about the child's well-being. The second theme, The Place of the Child, included the subthemes: Neutral, Honest, and Direct Communication with the Child, Not for Children's Ears, and Framing the Message with Care. Parents' approaches to preparing their child for healthcare visits ranged from neutral explanations to explicitly discussing the visit's purpose. Some parents felt uncomfortable addressing weight-related topics in front of their child, fearing it might contribute to eating disorders. Others emphasised the importance of involving the child in a sensitive, age-appropriate manner.
Conclusion: Few studies have investigated parents' experiences with HCP interactions during obesity treatment in early childhood. This study found that parents' experiences range from empathetic and supportive to those marked by blame and weight stigma. Preferences for involving children in weight-related discussions varied, with some parents deeming such conversations inappropriate and others viewing them as valuable learning opportunities. HCPs should adopt a sensitive, non-judgmental approach, tailoring communication to both parents and children, to reduce stigma and foster constructive weight management consultations.

Conflict of Interest: None disclosed

Funding: No funding to report

PO3.077

Childhood BMI trajectories and the risk of hypertension in adulthood

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Introduction: Childhood body size influences the development of hypertension (HTN), which is a major modifiable risk factor for cardiovascular disease. Less is known on how body size development across childhood ages is related to HTN risk, mainly due to methodological variations and limited longitudinal data. In this study, we examined whether longitudinal patterns of body mass index (BMI) changes during child-hood are associated with the risk of developing HTN in adulthood, leveraging a large cohort of Copenhagen schoolchildren.
Methods: This prospective cohort study included 337,928 children (51% boys), born between 1930 and 1996, from the Copenhagen School Health Records Register. Each child had between 2 and 12 measure-ments of weight and height recorded by school doctors and nurses between ages 6 and 15 years. Five sex-specific distinct childhood BMI trajectories at these ages were identified through latent class trajectory models: below-average (men: 23%, women: 21%), average (men: 42%, women: 39%), above-average (men: 25%, women: 26%), overweight (men: 9%, women: 11%), and obesity (men: 2%, women: 3%). We followed individuals in Danish health registers from 1977 to 2023 to identify adults who developed HTN from age 25 onwards. Childhood BMI trajectories were used as exposures, and sex-specific hazard ratios (HR) with 95% confidence intervals (CI) for HTN were estimated using Cox proportional hazards models. Analyses were adjusted for age and birth cohort.
Results: During follow-up, 38,465 men (23%) and 37,178 women (22%) were diagnosed with HTN. Men with the above-average BMI trajectory in childhood had a 10% increased hazard of HTN in adulthood (HR: 1.10; 95% CI: 1.07–1.13), while those with overweight had a 41% higher hazard (HR: 1.41; 95% CI: 1.36–1.47) as compared to men with the average childhood BMI trajectory. Men with the childhood obesity BMI trajectory had the highest hazard of HTN, with an HR of 1.95 (95% CI: 1.80–2.12) compared with the aver-age trajectory. Conversely, men with a below-average BMI trajectory had a lower rate/hazard of HTN (HR: 0.94; 95% CI: 0.91–0.96) than men with the average trajectory. Similar estimates were observed among women: those with below-average, above-average, overweight, and obesity BMI trajectories in childhood had HRs of 0.98 (95% CI: 0.95–1.01), 1.13 (95% CI: 1.10–1.16), 1.34 (95% CI: 1.29–1.39), and 1.92 (95% CI: 1.80–2.06), respectively, compared to the reference group.
Conclusion: Childhood body size, as captured by BMI trajectories, is associated with the risk of HTN in adulthood in a dose-response manner. Individuals who had a childhood BMI trajectory above-average, overweight or obesity, had a significantly increased risk, while those with a below-average BMI trajectory had a lower risk. These findings underscore the importance of early-life prevention and intervention to miti-gate the long-term cardiovascular risks associated with childhood overweight and obesity.

PO3.078

Associations between childhood BMI trajectories and adult heart failure

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Introduction: As damage to the cardiovascular system can start even early in life, and obesity in adult life is positively associated with heart failure (HF) we examined whether trajectories of body mass index (BMI) development across childhood were associated with incident HF in adulthood.
Methods: Our study included 167,176 girls and 171,002 boys from the Copenhagen School Health Records Register who were born from 1930-1996. Childhood weights and heights were regularly measured at school health examinations at ages 6-15 years. Using latent class trajectory modelling, five sex-specific childhood BMI trajectories were identified. Information on adult HF diagnoses (≥25 years) was obtained from the Danish National Patient Register between 1977-2023. Sex-specific hazard ratios (HR) and 95% confidence intervals (CI) were estimated using Cox regression models with childhood BMI trajectories as the exposure of interest.
Results: During this study 7,267 women and 13,253 men were diagnosed with HF (median follow-up time 35.9 years). Most children had the average BMI trajectory (39% girls, 42% boys) in childhood, and fewer had the below-average (21% girls, 23% boys), above-average (26% girls, 25% boys), overweight (11% girls, 9% boys), or obesity (3% girls, 2% boys) childhood BMI trajectories.
Among men we saw positive associations between childhood BMI trajectory groups and HF with the strongest associations in younger men. Men with BMI trajectories at the levels of above-average (HR=1.21, 95% CI: 1.13-1.30 before 65 years (<65), HR=1.13, 95% CI: 1.07-1.20 after 65 years (≥65)), overweight (HR(<65)=1.80, 95% CI: 1.65-1.98, HR(≥65)=1.33, 95% CI: 1.21-1.46), and obesity (HR(<65)=2.45, 95% CI: 2.05-2.92, HR(≥65)=1.53, 95% CI: 1.20-1.96) had increased rates of HF compared with the average BMI trajectory. Men with the below average BMI trajectory had decreased rates of HF compared with men with the average BMI trajectory (HR(<65)=0.92, 95% CI: 0.85-0.99, HR(≥65)=0.89, 95% CI: 0.83-0.95). In women, the associations differed by age only for those with the obesity childhood BMI trajectory. The estimates were HR=1.22 (95% CI: 1.15-1.30) for the above-average trajectory and HR=1.60 (95% CI: 1.48-1.73) for the overweight trajectory. For the obesity trajectory they were HR(<65)=3.08 (95% CI:2.53-3.74) and HR(≥65)=2.25 (95% CI:1.85-2.73). No significant association was found with the below-average BMI trajectory (HR=0.97, 95% CI 0.90-1.04).
Conclusion: Childhood BMI trajectories above average were adversely associated with adult HF compared with the average childhood BMI trajectory. This association was strongest in individuals below the age of 65 but a significant association was still seen after age 65. Our findings show that BMI levels above average during childhood indicate risks of HF, highlighting the importance of considering this period of life in relation to the development of heart health.

Conflict of Interest: Unrelated to this work JLB has received consulting fees from Novo Nordisk A/S.

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PO3.079

Process evaluation of the NAPSACC UK randomised controlled trial: an environmental nutrition and physical activity intervention in early childhood education and care settings in the UK

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Background: Many children develop obesity during preschool years. Most also attend early childhood education care (ECEC) settings. ECECs provide opportunities to improve health through improved nutritional quality and physical activity for young children. There is evidence from the US that the NAPSACC intervention improves nutrition and physical activity in ECECs. We adapted NAPSACC for the UK and investigated its fidelity, acceptability and sustainability within a multi-centre trial.
Methods: Embedded process evaluation within a cluster randomised controlled trial with 52 ECECs (25 intervention and 27 control). The NAPSACC UK intervention comprised two six-month cycles of nutrition and activity self-assessment, staff workshops and goal setting, supported by public health practitioners. Data included: observations and questionnaires of training and workshop delivery; 11 interviews with practitioners who delivered the intervention, 11 ECEC managers, 5 commissioners, and two focus groups with the research team. Document analysis of self-assessment and goal-setting forms was undertaken. Analysis used deductive and inductive codes, a coding framework and triangulation across data sources.
Results: Three-quarters (76%) of intervention ECECs implemented the NAPSACC intervention across one cycle. Only 40% implemented a second cycle, mainly due to delays in scheduling staff workshops. ECEC managers valued the opportunity to reflect on practice and the support offered by the public health practitioner. ECEC staff rated the workshops highly. 83% of nutrition and 70% of physical activity goals set by the ECECs were achieved (fully or partially) and self-assessment scores increased, with greater gains for ECECs implementing two cycles. ECEC managers planned to maintain the changes made but not all planned to continue self-assessment and goal-setting processes.
Conclusions: Despite sector-wide staffing challenges, we saw high engagement from ECECs in self-assessment and setting goals to improve child nutrition and activity. Potential roll-out of NAPSACC UK would benefit from tailoring activities and sustained support for practitioners and ECECs.

PO3.080

Prevalence of sarcopenic obesity among adolescents with overweight and obesity and association with physical activity, physical fitness, and cardiometabolic outcomes

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Background: Overweight and obesity adversely affect health and are important global issues. Sarcopenia is also an important problem with the double burden of malnutrition. In adolescents, information on sarcopenic obesity (SO) is limited. Factors such as dietary intake, physical fitness, and health outcomes associated with SO are seldom discussed. This study aims to assess the prevalence of SO and its associated factors in adolescents.
Methods: Adolescents aged 10–17 years with overweight or obese were invited to participate. Demographic and anthropometric data were collected. Body composition was assessed using bioelectrical impedance analysis. Physical activity data was collected using a validated questionnaire. Physical fitness assessment including hand grip strength and 6-minute walk test were performed. Fasting blood samples were collected and analyzed for cardiometabolic and inflammatory markers. SO was defined using muscle-to-fat ratio.
Results: A total of 95 participants were enrolled. (63.2% male) Mean age was 12.9 (2) years. Mean BMI z-score was 2.8 (0.8). The prevalence of SO was 75.8%, with significantly higher prevalence in males (88.3%) compared to females (54.3%) ($p<0.001$). Among participants with obesity, 82.7% were classified as having SO, compared to 35.7% of participants with overweight ($p=0.001$). Sedentary behavior was higher among participants with SO ($p=0.04$). Normalized hand grip strength (nHGS) was significantly lower in the SO group (0.55 ± 0.16 kg/kg vs. 0.64 ± 0.15 kg/kg, $p=0.024$). Fasting insulin level, HOMA-IR, ALT, and hs-CRP, were significantly elevated in the SO group.
Conclusion: Prevalence of SO among adolescents with overweight and obesity was high, particularly in males and those classified as obese. SO was associated with higher sedentary behavior, lower nHGS, and adverse cardiometabolic and inflammatory markers. These findings highlight the importance of early identification and targeted interventions for SO in adolescents to prevent long-term health complications.

PO3.081

Nutritional profile and prevalence of cardiovascular risk in children treated in a nutrition outpatient unit

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This study describes the nutritional status of children and adolescents and highlights the prevalence of obesity and associated health complications. Obesity is recognised as a public health problem, requiring its integration into health promotion strategies, given its multifactorial aetiology. Despite existing initiatives and public policies in Brazil, the seriousness of childhood obesity persists, highlighting the need for assistance for this population. The individual nutritional counselling could be an alternative to improve the nutritional status and consequently the health of the pediatric population. In this report we showed the results of nutritional ambulatory attendance and individual counselling based in Transtheoretical Model of Behavior Change.
Methodology: demographic, nutritional and clinical status data were obtained from the protocols of patients treated between 2009 and 2019 in the Center of Studies and Practices in Nutrition of University of São Paulo State- SP-Brazil. Anthropometric indicators of children and adolescents at baseline and last attendance were evaluated. Body mass index (BMI/age/gender) was assessed according to percentiles (P) of the WHO reference standard, as eutrophic between P≥3o and <85o, overweight P≥85o and <95o; and obesity P≥95o. The relative frequency of no communicable chronic diseases (NCDs) was evaluated according to BMI and to family history of NCDs. The comparison between nutritional status before and after intervention was performed. Guidance based on motivational interviews and transtheoretical model of behavior change were employed in the interventions.
Results: 161 patient between 2 and 19 years were evaluated. High proportion of people with obesity was seen (81%) Dyslipidemia was found in 26% and hypertension in 8% of children and adolescents. There was a significant association between nutritional status and these disorders ($p<0,05$), but there was no association with reported familiar history. Follow-up on nutritional care of outpatient care occurred in mean 2.9 consultations. The reduction in body mass after nutritional care, reflected in a reduction in BMI, on average 1.3 points, however, there was weight

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Tab. 1. Average of BMI before e after nutrition care of children and adolescents.

Nutritional status	underwheight (n=6)		Eutrophy (n=8)		overwheight (n=17)		obesity (n=130)	
	Time 1	Time 2	Time 1	Time 2	Time 1	Teme 2	Time 1	Time 2
BMI	14,39 ±0,79	14,51 ±0,75	17, 5 ±3,1	17,49 ±3,03	23,1 ±4,04	22,87 ±4,03	28,21 ±4,86	27,63 ±5,28
p	0,29		0,69		0,16		0,041	

* Number of children and adolescents monitored: 161. *p<0.05 statistical differences between Time 1 and Time 2, according to T-test.

Source: the authors

-Title of summary **"Nutritional profile and prevalence of cardiovascular risk in children treated in a nutrition outpatient"**

Averages and standard deviation of Body Mass Index (BMI) in nutritional status categories, at baseline (Time 1) and after outpatient care (Time 2), Botucatu 2009-2019.

gain of up to 6 points in some other ones. The BMI average was significantly less after nutrition care to child with obesity (table p=0,041).

Conclusions: the council is partially efficiency against overweigh; the comorbidities hypertension and dyslipidemia affect early the health in response to inadequate nutritional status. According to data presented, it is necessary to develop more and new strategies the adoption of eating for the challenge of behavioral changes in this phase of life, respecting the individualities beyond the nutritional needs of children and adolescents. We suggest entertainment with social media and parents' groups to improve the results in nutrition intervention to pediatric population.

PO3.082

The association between maternal vitamin D levels and infant birth weight for gestational age in pregnancy after bariatric surgery: need for future research and updated guidelines

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Background: Bariatric surgery (BS) may increase the risk of maternal vitamin D deficiency, which has been implicated in reduced fetal growth in non-BS populations. This study aims to determine whether maternal vitamin D levels are associated with infant birth weight for gestational age z-score in pregnant women after BS, while exploring effect modification by calcium or PTH.

Methods: Multicenter prospective cohort study including 125 pregnant women with a history of BS. Maternal serum 25(OH)D levels were determined in all trimesters (T1 – T3), and investigated continuously and grouped into four categories: low (< 50 nmol/L), moderate (50 – 74 nmol/L), moderate-to-high (75 – 99 nmol/L; reference group), and high (≥ 100 nmol/L). Multivariable linear regression and linear mixed models were used for trimester-specific and longitudinal analyses, respectively. Effect modification by calcium levels were studied by adding interaction terms to the respective models.

Results: Vitamin D levels over the course of pregnancy did not differ between mothers of SGA and non-SGA infants (p = 0.38). In trimester 1, both low (<50nmol/L) and high (≥ 100 nmol/L) vitamin D levels were associated with a lower gestational age z-score compared to moderate vitamin D levels (β-low −0.81 [95% CI −1.36, −0.26], p<0.01 and βhigh −0.59 [95% CI −1.16, −0.013, p0.04]). In trimester 3, all categories compared to the moderate vitamin D group were associated with lower z-scores (β-low −0.59 [95% CI −1.07, −0.12], β-moderate −0.62 [95% CI −1.13,−0.11], β-high −0.62 [95% CI −1.12, −0.12]). In T2, high vitamin D levels were associated with a lower z-score among women with a low calcium status (β −0.77 [95% CI −1.52, −0.03] but not among those with high calcium status (β 0.09 [95%CI -0.62, 0.81], p-interaction = 0.05.

Conclusion: Although vitamin D levels over the course of pregnancy did not differ between mothers of SGA and non-SGA infants, distinct non-linear associations between both low and high maternal vitamin D levels with birth weight for gestational age z-score were observed in different trimesters in pregnant women post-BS, with reversed associations across different calcium status levels in trimester 2. Because this study is largely explorative, future studies are needed to replicate these findings, establish causality, and to provide additional insights in the potential mechanisms underlying the associations between maternal vitamin D and infant birth weight for gestational age in pregnant women post-BS. f confirmed, our findings may indicate that for optimal fetal growth sufficient vitamin D should be provided to prevent low vitamin D status, but not an oversupply, with a suggested target range of 75 – 99 nmol/L. This may then also inform future recommendations for vitamin D levels, which currently do not consider pregnancy outcomes, and would potentially highlight the need for a pregnancy-specific reference interval for vitamin D, at least in this specific population.

PO3.083

Self-reported symptoms of anxiety and depression in young people living with obesity attending a paediatric weight management service, using the Revised Child Anxiety and Depression Scale (RCADS)

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Introduction: There is substantial amount of evidence documenting the impact of living with a chronic health condition, and in particular living with obesity (LwO) on children and young people's (CYP) quality of life

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Subscales	Male (all ages, n=25)	Female (all ages, n=32)	Under 12 (all genders, n=18)	Over 12 (all genders, n=39)
Separation anxiety	52%	44%	44%	49%
Generalised anxiety	24%	6%	22%	10%
Panic	28%	28%	22%	30%
Social phobia	16%	25%	22%	21%
Obsessions/compulsions	8%	3%	11%	3%
Depression	44%	34%	33%	41%
Total anxiety	24%	31%	22%	31%
Total anxiety and depression	32%	34%	22%	38%

Fig. 1. Percentage of age and gender with T-Scores above 65 for the RCADS subscales.

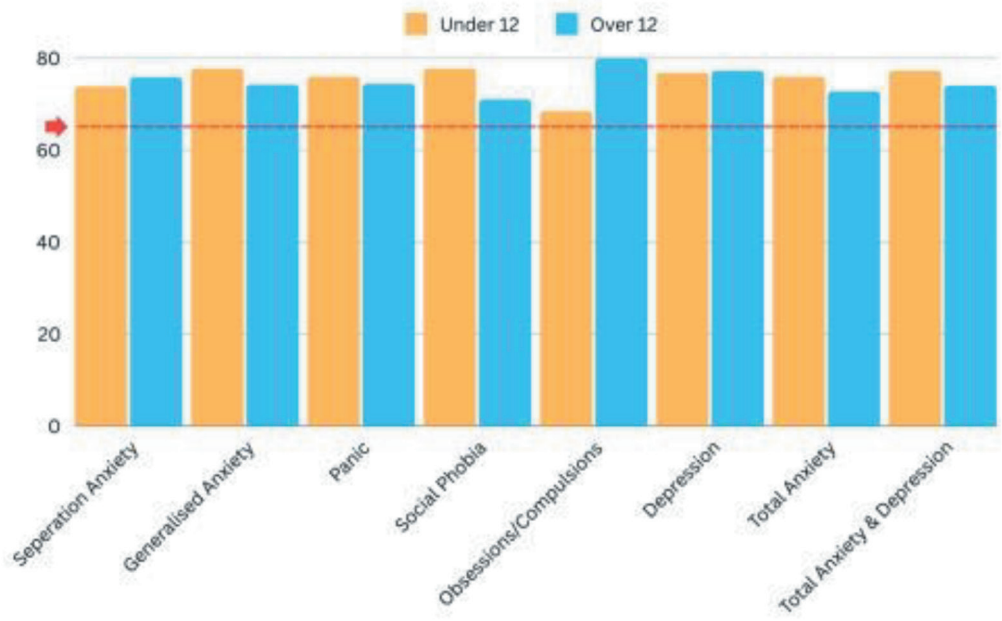


Fig. 2. Average T-Scores for ages (under 12, over 12). Line to show cut off score of 65.

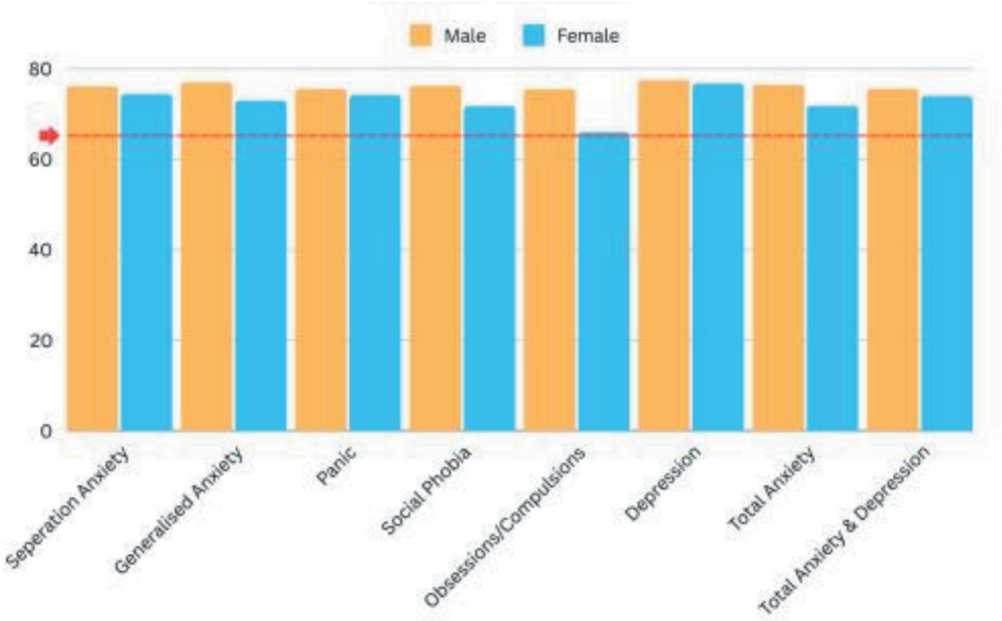


Fig. 3. Average T-Scores for gender (male, female). Line to show cut off score of 65.

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(D'avila et al., 2019, BPS Obesity Task and Finish Group, 2019). It has been suggested that living with obesity is a significant risk factor for anxiety and depression for children and adolescents (Lindberg, 2020).
Methods: Data was collected between July 2023 and October 2024, from all patients over 8 years of age attending the Leeds CEW service (n=57) for their initial education session. Young people or their parents/carers (depending upon cognitive ability) completed the RCADS. Microsoft Excel was used to conduct average scores across Age and Gender for each subscale of RCADS. RCADS report a T-Score between 65 and 69 to be within borderline clinical range (Chorpita at al., 2000) and therefore scores of 65 and above were included within the analysis.
Results: Children and young people living with obesity within these results score above this general population percentage for all subscales except for Obsessions and Compulsions (Females = 3%, over 12 = 3%).
Gender: 31% of females across all ages met the threshold for Total Anxiety, and 34% of females across all ages met the threshold for Total Anxiety and Depression. 24% of males across all ages met the threshold for Total Anxiety, and 32% of males met the threshold for Total Anxiety and Depression. Separation Anxiety was the most prevalent subscale to be scored highly in both males (52%) and females (44%), and the least common was Obsessions and Compulsions in both males (8%) and females (3%).
Age: 22% of under 12s, both male and female, met the threshold for Total Anxiety, and 22% of under 12s, both male and female, met the threshold for Total Anxiety and Depression. 30% of over 12s, both male and female, met the threshold for Total Anxiety, and 38% of over 12s, both male and female, met the threshold for Total Anxiety and Depression. Separation Anxiety was the most prevalent subscale to be scored highly for both under 12 (44%) and over 12 (49%) and the least common was Obsessions and Compulsions in both under 12 (11%) and over 12 (3%).
Conclusion: Young people LwO experiencing health-related complications have considerably higher T-Scores for 7 out of 8 subscales on the RCADS when compared to youth in the general population. This highlights the importance of paediatric weight management services to measure RCADS as an outcome in clinical practice and to highlight associated issues. Separation anxiety was the most prevalent subscale to score highly within this population. This reinforces the need for family based approach when working with children and young people LwO. Further research is needed to explore the potential link between LwO and separation anxiety. The importance of the availability of local mental health services and third sector organisations to ensure the appropriate support is accessible, alongside specialist weight management services.

PO3.084

Effectiveness of NAPSACC UK: an environmental nursery nutrition and physical activity cluster randomised controlled trial

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Aim: To investigate the effectiveness of 'NAPSACC UK' for nutritional intake and physical activity in early education settings.
Background: Over 90% of children aged ≤4 attend UK early education settings. There is evidence that the 'NAPSACC' intervention improves nutrition and physical activity in US nurseries.
Methodology: Cluster randomised controlled trial using repeat cross-sectional assessments with 52 UK nurseries and 570 consented 2-5 year-olds. Stratified randomisation allocated 25 nurseries to intervention and 27 to usual practice control. The one-year NAPSACC UK intervention had two cycles of: nutrition and physical activity self-assessment, staff workshops and goal setting supported by public health practitioners. Co-primary outcomes were average total energy (Kcal) intake per eating occasion (lunch and snacks) consumed at nurseries and accelerometer-assessed total activity time on nursery days. Secondary outcomes were moderate-to-vigorous physical activity, sedentary time, serving size, and diet quality (percentage of core and non-core food consumed), and zBMI. Analysis was intention-to-treat.
Results: There was no evidence of an intervention effect for average Kcal/occasion consumed at nurseries (geometric mean ratio 0.86, 95% CI [0.72, 1.03], p=0.09) and minutes of total physical activity (mean difference -2.13 [-10.96,6.70], p=0.64). There was evidence that the intervention reduced Kcal served and consumed at lunch (mean difference -69.1 [-116, -22.2], p=0.004 and -67.7 [-118.6, -18.7], p=0.009, kcal/lunch respectively). There was no evidence of a difference between treatment arms for 9/11 secondary outcomes for Kcal served and consumed at snacks, proportion of non-core Kcal consumed, zBMI and physical activity secondary outcomes. 76% (19/25) of intervention nurseries completed at least one cycle of NAPSACC UK.
Conclusions: NAPSACC UK did not improve physical activity or average calorie intake per eating occasion. NAPSACC UK did reduce energy serving and consumption for lunches, closer to national guidelines for portion size, but not snacks. NAPSACC UK should be optimised for lunches.

PO3.086

Cardiometabolic baseline characteristics of Young Adults with Early-onset Obesity Treated with Semaglutide –the RESETTLE trial

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Background: Childhood-onset obesity is associated with increased risk of developing cardiometabolic disease including early-onset type 2 diabetes and cardiovascular disease as well as a reduced quality of life. Pediatric hospital-based non-pharmacological obesity care can reduce childhood obesity, although up to 25 % do not reduce degree of obesity. This study presents cardiometabolic baseline characteristics of participants in the ongoing clinical trial RESETTLE1, which investigates the effect of the glucagon-like peptide-1 receptor agonist semaglutide as an add-on to hospital-based obesity care in youth who still live with obesity following hospital-based pediatric obesity care.
Methods: The RESETTLE trial is an investigator-initiated, randomised, placebo-controlled, double-blinded trial. The participants are young adults (aged 18-28 years) with persisting childhood-onset obesity who received treatment at The Children's Obesity Clinic, Department of Paediatrics, Holbaek University Hospital, Denmark. They are categorized into two groups based on previous response to pediatric obesity management: Low treatment response (Group A): Body Mass Index (BMI) standard deviation score (SDS) reduction ≤ 0.1 and medium treatment response (Group B): BMI SDS reduction >0.25. Participants are randomised 2:1 to subcutaneous injections of semaglutide 2.4 mg once-weekly or placebo as an add-on to hospital-based obesity care for 68 weeks.

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Tab. 1. Characteristics of the participants in the RESETTLE trial at baseline, start of pediatric obesity care program and end of pediatric obesity care program. The table presents the mean (SD) for normally distributed data, the median (IQR) for non-normally distributed data.

		Group A (N=82)	Group B (N=80)
Baseline RESETTLE			
	Age	21.9.(2.8)	22.1 (2.9)
	Sex ass ssigned at birth, male, N (%)	31 (37.8)	36 (45)
	Height (cm)	174 (9.1)	173.5 (8.0)
	Weight (kg)	122.9 (22.9)	114.9 (21.5)
	BMI (kg/m2)	40.5 (6.2)	37.9 (5.4)
	BMI z-score	3.4 (0.5)	3.3 (0.6)
	Waist circumference (cm)	115.3 (14.8)	111.5 (15.5)
	Hip circumference (cm)	129 (12.8)	122.6 (10.4)
	Systolic blood pressure (mmHg)	135 (11.6)	136 (11.4)
	Diastolic blood pressure (mmHg)	84 (7.8)	85 (9.64)
	Total cholesterol (mmol/L)	4.4 (0.74)	4.5 (0.64)
	LDL cholesterol (mmol/L)	2.87 (0.7)	2.95 (0.62)
	HDL cholesterol (mmol/L)	1.06 (0.24)	1.11 (0.26)
	Triglycerides (mmol/L)	1.2 (IQR: 0.9 - 1.6)	1.08 (IQR: 0.9 - 1.5)
	Glucose fasting (mmol/L)	5.46 (0.62)	5.59 (0.61)
	Hba1c (mmol/mol)	34.4 (2.9)	34.7 (3.45)
	Metabolic syndrome (%)	77%	65%
Start of Pediatric Obesity Care program			
	Age	12.0 (2.9)	10.9 (2.87)
	Height (cm)	155.5 (15.3)	156.0 (15.5.0)
	Weight (kg)	69.2 (25.6)	62.5 (21.8)
	BMI z-score	2.8 (0.6)	3.08 (0.6)
	Waist circumference (cm)	92.6 (16.0)	91.8 (13.8)
	Hip circumference (cm)	97.4 (15.5)	95.4 (14.2)
	Systolic blood pressure z-score	0.6 (0.9)	0.7 (1.1)
	Diastolic blood pressure z-score	0.1 (0.6)	0.2 (0.8)
	Metabolic syndrome (%)	29%	16%
End of Pediatric Obesity Care Program			
	Age	1.6 (2.64)	15.3 (2.9)
	Height (cm)	169.0 (11.5)	164.8 (11.9)
	Weight (kg)	95.7 (27.4)	76.0 (20.0)
	BMI z-score	3.0 (0.7)	2.5 (0.8)
	Waist circumference (cm)	105.0 (17.0)	92.9 (13.3)
	Hip circumference (cm)	113.0 (14.5)	101.0 (11.0)
	Systolic blood pressure z-score	0.9 (0.83)	0.7 (0.9)
	Diastolic blood pressure z-score	0.1 (0.64)	-0.01 (0.7)
	Metabolic syndrome (%)	32%	11%

Results: A total of 162 participants are included in the study. Baseline characteristics, presented as mean (SD) are presented in table 1 and were as follows for Group A (n = 83) and Group B (n = 79): Age: 22 (2.8) years and 22 (2.9) years; weight: 122.9 (22.9) kg and 114.9 (21.5) kg; BMI: 40.5 (6.2) kg/m² and 37.9 (5.4) kg/m²; waist circumference: 115.3 (14.8) cm and 111.5 (15.5) cm; systolic blood pressure: 135 (12) mmHg and 136 (11) mmHg; diastolic blood pressure: 84 (7.8) mmHg and 85 (10) mmHg and fasting glucose: 5.46 (0.62) mmol/L and 5.59 (0.61) mmol/L. The prevalence of metabolic syndrome was 77% in Group A and 65% in Group B. At the start and end of pediatric obesity care the prevalence of metabolic syndrome was 29% and 32% for Group A and 16% and 11% for Group B respectively.

Conclusion: Young adults with childhood-onset obesity who continue to live with obesity in early adulthood represent a particularly vulnerable group facing an elevated risk of cardiometabolic disease as indicated by the high prevalence of metabolic syndrome and the associated risk factors. These findings highlight the importance of early, effective intervention in managing childhood-onset obesity.

Reference

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PO3.087

Long-Term Socio-Economic Outcomes of Pediatric Obesity: A Population-Based Cohort Study

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Introduction: Pediatric obesity is more prevalent among individuals from lower socio-economic backgrounds compared to those from higher socio-economic positions. Estimating socio-economic position in early adulthood is challenging, as income levels are often low during the educational phase. The impact of childhood obesity on future employment, educational activity, parental leave, and long-term sick leave remains unclear. This study aimed to evaluate these outcomes at 25 and 30 years of age in a cohort who had obesity in childhood and among general population comparators.
Methods: Data from individuals born between 1978–1996 (53% males) from The Swedish Childhood Obesity Treatment Register (BORIS http://www.e-boris.se/in-english/) were linked to national welfare registers. A comparison group from the general population was matched to the BORIS cohort on sex, year of birth, and living area. Since several activities (e.g. employment and studying) can overlap, the primary activity was determined based on the predominant source of income and categorized as follows; "Employment" defined as an annual salary of at least €20,000 (2023 Euros), exceeding received financial support. "Underemployment" defined as an annual salary below €20,000 but exceeding the sum of financial support. "Student" defined as receiving study allowance that surpassed declared salary and other financial support. "Sick leave" defined as receiving financial support for long-term sickness, early retirement, or disability that exceeded income from employment, education, or childcare support. "Parental leave" defined as receiving childcare support exceeding income from other sources. "Other" included uncategorized individuals, e.g. unemployed, receiving welfare benefits, or engaging in a mix of above-mentioned categories with no dominant primary activity. The outcomes were assessed between 2003–2021, and unadjusted proportions are reported.
Results: At age 25, 3,769 individuals from the pediatric obesity cohort and 18,375 comparators were assessed, decreasing to 1,261 and 6,161, respectively, by age 30. At 25 years of age, 54.4% of the pediatric obesity cohort were employed or studying, compared to 66.1% of the general population ($p < 0.0001$). By age 30, these proportions were 58.3% and 71.4%, respectively ($p < 0.0001$). The primary driver of the observed discrepancy seemed to be sick leave, which affected 12.4–13.3% of the pediatric obesity cohort compared to 3.5–3.8% of the general population comparators at ages 25 and 30, respectively. The proportion of individuals with underemployment was similar between groups, with 21.1% in the pediatric obesity cohort and 21.7% in the general population at age 25 ($p = 0.42$).
Conclusion: Individuals with pediatric obesity are less likely to be engaged in work or studies in early adulthood compared to their general population peers, with sick leave emerging as a major contributing factor. These findings highlight the long-term socio-economic impact of pediatric obesity and underscore the need for early interventions to mitigate its effects on future health and economic outcomes.

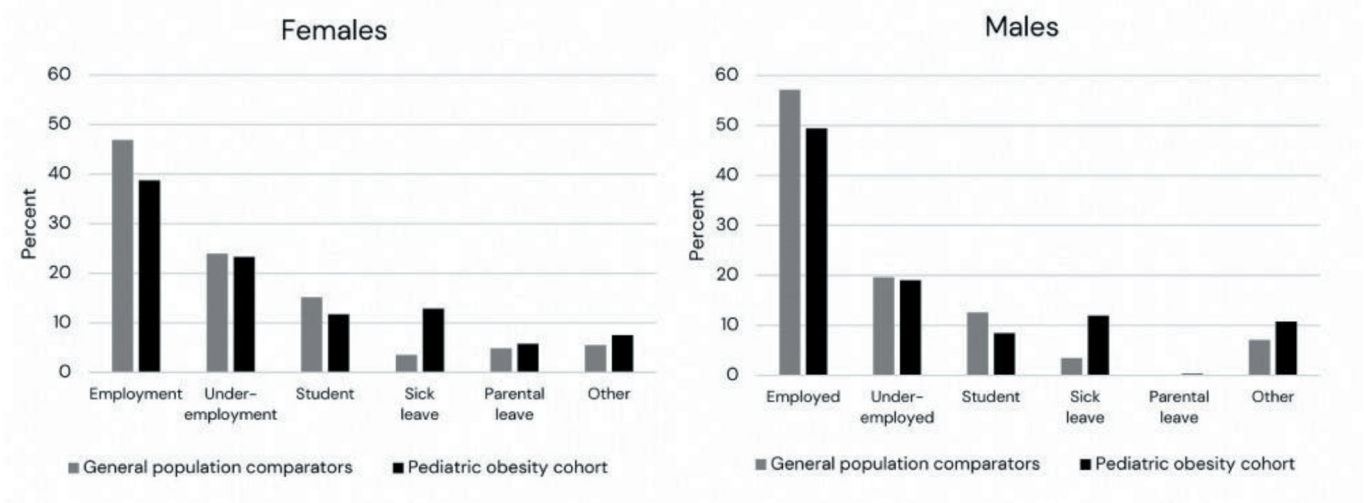
PO3.088

The Use of Personalised Health Budgets to Enable Access to Physical Activity for Young People Living with Obesity – a Pilot Intervention

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Nottingham University Hospitals NHS Trust

Introduction: The Complications from Excessive Weight (CEW) service is a National Health Service (NHS) England program providing Tier 3 weight management support for young people (YP) living with severe obesity (>99.6th percentile Body Mass Index (BMI)) and related health conditions. YP living with obesity face numerous barriers to engaging in physical activity. In high-income countries, those living in areas of low socioeconomic status (LSES) are at higher risk of obesity (1) and are less likely to meet physical activity guidelines compared to peers from mid-to-high socioeconomic backgrounds (2). Factors contributing to lower activity levels in YP from LSES include unsafe outdoor spaces, reliance on vehicle transportation to school, financial limitations, and sedentary habits such as excessive screen time (3). Additionally, many CEW participants face challenges with mental health and neurodiversity, which may require specialised, person-centred support (4).
Methods: NHS Nottingham and Nottinghamshire Integrated Care Board (ICB) was approached to seek financial support for CEW patients. YP reporting financial barriers limiting their access to physical activity were identified. Physiotherapists explored individual barriers and developed bespoke programmes for physical activity. Application for a Personal Health Budget (PHB) of approximately £150 per person was completed. Number of minutes of physical activity per week (MPA) was recorded at baseline and after completion of PHB funding.



Main activity at 25 years of age among individuals with a history of pediatric obesity and their general population comparators.

Fig. 1.

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Results: Data are expressed as median (range) or mean [SD].
Funding support was offered to 37 YP and was accepted by 28 (11M, 16F, 1NB). 18 completed funding use. Age was 15.5 (4.0-18.0) yrs, BMI z-score 3.86 [0.65]. 19 (68%) YP were from the lowest socioeconomic deciles (1 to 3), representing the 30% most disadvantaged areas. Each YP received £150 (£132-£264) funding. Funding was used most for gym access (n=15), swimming lessons or open access pool (n= 13). 7 YP used their PHB for more than 1 activity, and some also used the funding to purchase exercise clothing. 8 YP were supported by physiotherapists to participate in activities.
MPA increased following PHB: 0 (0-240) min at baseline vs 130 (30 – 360) min at completion, p<0.001 (2 tailed paired t test, n=18).
Feedback from YP and their carers was very positive, with some families reporting shifts in financial priorities within the household to support continued participation in exercise:
"They were much more active, they came out sweating, was tired and slept better, I have continued to pay for them to keep trampolining as I knew how important it was to their health, and it made them happy".
Conclusion: Use of PHBs enabled increased access to and participation in physical activity for YP living in areas of high deprivation and should be considered as part of obesity interventions for YP.

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Conflict of Interest: Nil

Funding: Nil

PO3.089

Launching A New Obesity Calculator for European Children and Adolescents: The Agbaje's Waist-to-Height Ratio Calc

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Background: Body mass index (BMI) is a universal surrogate marker of childhood obesity, but it is significantly flawed due to several limitations such as variability with age and sex, inability to distinguish between muscle and fat mass, and misclassifications of normal children as overweight. In 2023, the clinical guideline on managing childhood obesity by the American Academy of Pediatrics listed knowledge gaps warranting urgent research such as identifying "alternative, accurate measurements of adiposity in primary care" apart from BMI. Recently, the Committee on Childhood Obesity of the European Association for the Study of Obesity (EASO) published "Time for a New Framework that treats obesity in children as an adiposity-based chronic disease. It was proposed that "it is time to define cut-offs for adiposity (such as waist-to-height ratio) that are age and sex-specific for children."
Methods: Over a 15-year follow-up, 7237 (3667 females) nine-year-old children from the Avon Longitudinal Study of Parents and Children (ALSPAC) UK birth cohort had total fat mass and trunk fat mass serially measured with dual-energy X-ray absorptiometry (DXA) at ages 9, 11, 15, 17, and 24 years. BMI and waist circumference-to-height ratio (WHtR) were computed. Intraclass correlations (ICC), and area under curve (AUC) analyses were conducted. The absolute agreement of surrogate measures of adiposity with DXA-measured body composition was examined and age and sex-specific WHtR cut-offs were defined.
Results: WHtR provided a better longitudinal absolute agreement [males ICC 0.84 (95% CI 0.84 – 0.85); females 0.81 (0.80 – 0.82)] than BMI [(males (0.65 (0.64 – 0.66); females 0.72 (0.71 – 0.73)] with total fat mass as well as trunk fat mass from ages 9 – 24 years. WHtR cut-point for predicting excess total fat mass (75th – 95th percentile) was 0.50 - 0.53 in males [AUC 0.86-0.94, sensitivity 0.51 – 0.79 and specificity 0.93 – 0.95]. WHtR cut-point for predicting excess total fat mass (75th-95th percentile) was 0.52-0.54 in females [AUC 0.83 – 0.95, sensitivity 0.38 – 0.68 and specificity 0.92 – 0.95]. Results were similar with trunk fat mass. The WhtR cutpoints were <0.40 in both males and females is low fat; 0.40 – <0.50 in males is normal fat; 0.40 – <0.51 in females is normal fat; 0.50 – <0.53 in males is high fat (adiposopathy grade 1); 0.51 – <0.54 in females is high fat (adiposopathy grade 1); >0.53 in males is excess fat (adiposopathy grade 2); >0.54 in females is excess fat (adiposopathy grade 2).
Conclusion: WHtR is an inexpensive alternative to BMI for predicting both total body fat mass and trunk fat mass from childhood through young adulthood. We have launched a new WHtR calculator based on this study that could be useful in correctly diagnosing excess fat among European youth in primary care. Therefore, where direct fat mass measures are lacking, BMI should not be used alone to diagnose obesity, but a simple WHtR calculator could be used to confirm whether high BMI levels in youth are due to muscle or fat mass. The new WHtR calculator (Agbaje Calc.) can be found at https://urfit-child.com/waist-height-calculator.



Fig. 1. Waist to height ratio barcode.

PO3.090

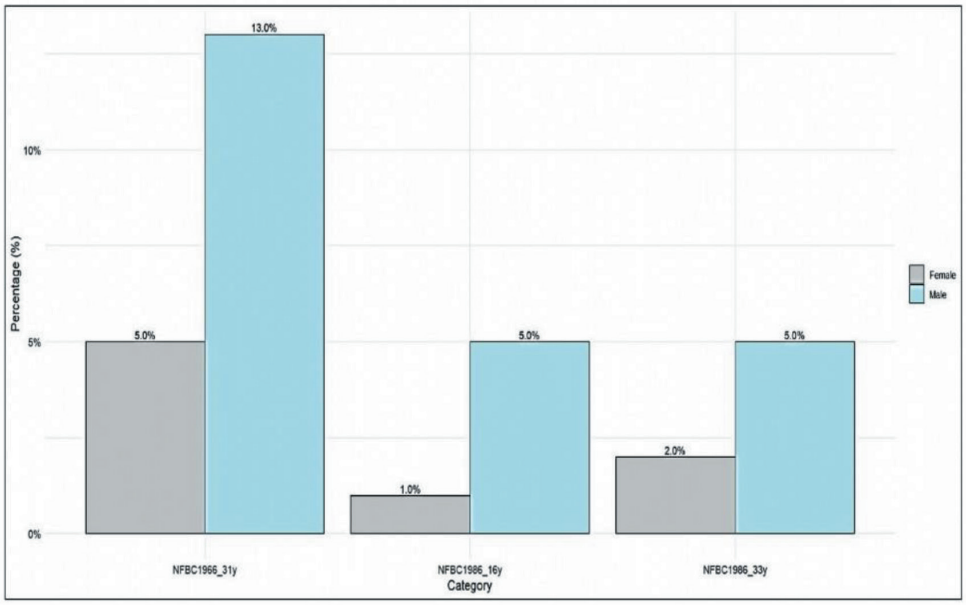
Early variations in body mass index trajectories and metabolic syndrome; a study across two generations of Northern Finland Birth Cohorts

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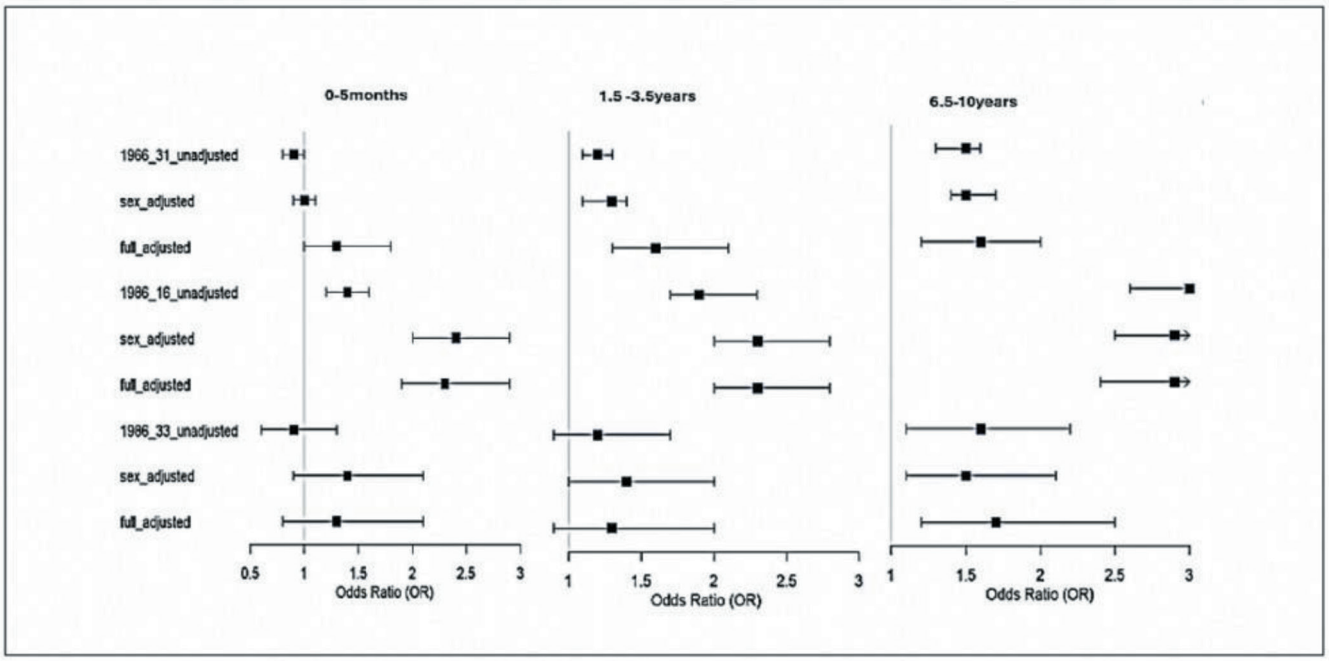
Introduction: Risk factors for metabolic syndrome are already identifiable in children with an overweight growth trajectory. However, the severity of the long-term effects of childhood body mass index (BMI) on later metabolic syndrome remains unknown. We aimed to understand the longitudinal pattern of change in childhood BMI and its association with later metabolic syndrome.
Methods: We studied Northern Finland's two generational birth cohorts (NFBC1966 and NFBC1986). The study selected 5647 participants at 31 year follow up in NFBC1966. In NFBC1986, we selected 5583 participants at 16 year follow up and 1777 participants at 33 year follow up. We used the International Diabetes Federation (IDF) criteria to diagnose metabolic syndrome at 16 years, and the National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP) definition to diagnose metabolic syndrome status in our adult participants. BMI slopes were derived at three time points: 0 to 5 months, 1.5 to 3.5 years, and 6.5 to 10 years; to test the associations of time specific changes in BMI with metabolic syndrome at 31 years in the NFBC1966 cohort and at 16 and 33 years in the NFBC1986 cohort. We adjusted for sex, birthweight, maternal pre-pregnancy BMI, and maternal smoking status during pregnancy.

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Metabolic syndrome among participants at 16 years was defined using the International Diabetes Federation paediatric definition, while adult metabolic syndrome was defined using the National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP). Out of 5583 adolescents in NFBC1986, we found a 3% (173) prevalence of metabolic syndrome. We also found a 3% (56) prevalence among 1777 participants at 33 years in NFBC1986 and 9% (489) prevalence among 5647 participants at 31 years of age in the NFBC1966. The prevalence of metabolic syndrome was higher in males than females among cohorts.

Fig. 1. Prevalence of metabolic syndrome by sex among NFBC 1966 and 1986 cohorts.



Results are shown in Odds Ratios (OR) for the unadjusted, sex-adjusted, and fully adjusted models for sex, birthweight, maternal pre-pregnancy BMI, and maternal smoking during pregnancy. Compared to earlier time points, BMI slope at 6.5-10 years showed a consistent and stronger positive association with MS in both cohorts and a mild increase in association when adjusted. Between the cohorts, adolescents in NFBC1986-16y showed the strongest association between BMI slope 6.5 to 10y and MS (OR = 2.9, 95% CI:2.4-3.5).

Fig. 2. Association of childhood BMI and metabolic syndrome among NFBC 1966 and 1986 cohorts.

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Tab. 1. Criteria used in the clinical diagnosis of metabolic syndrome.

	International Diabetes Federation (IDF) classification for 10 to 16 years	National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP III)
Waist circumference	≥ 90cm for boys and ≥ 80cm for girls	Men > 102 cm Women > 88 cm
Blood pressure Systolic Diastolic	≥ 130 mm Hg ≥ 85 mm Hg	≥ 130 mm Hg ≥ 85 mm Hg
Glucose	≥ 5.6 mmol/L(100mg/dL)	≥ 6.1 mmol/L
Triglycerides	≥ 1.7 mmol/L(150mg/dL)	≥ 1.7 mmol/L
HDL-cholesterol	< 1.03 mmol/L (< 40mg/dL)	Men < 1.04 mmol/L Women < 1.30 mmol/L

According to the IDF definition, metabolic syndrome is diagnosed with a waist circumference ≥ 90cm for boys and ≥ 80cm for girls, in addition to two other components. According to the NCEP III ATP definition for adults, metabolic syndrome is present if three or more criteria are met.

Results: The prevalence of metabolic syndrome was 9% in NFBC1966 at 31 years; and 3% at both 16 and 33 years in NFBC1986. We observed positive associations in all three childhood BMI time points across cohorts. However, BMI slope at time points 6.5 to 10 years exhibited stronger associations with metabolic syndrome, especially at 16 years (OR:3.0, 95% CI:2.6-3.5). The strength of associations increased when we adjusted for confounders.
Conclusion: Higher BMI increases the risk of later metabolic syndrome, especially during late childhood. Longitudinal study of childhood BMI is a potentially effective method to identify critical periods during childhood growth and thus develop effective health interventions.

Conflict of Interest: Authors declare that they have no conflict of interest.

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PO3.091

Indications of Empiric Vitamin D Deficiency Treatment in Children and Adolescents with Elevated BMI

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Background: Vitamin D (VD) is crucial for a number of bodily functions, including renal, GI, and bone health. Obesity is known to influence VD levels (VDL), highlighting the importance of monitoring VD in children with obesity for appropriate treatment. This study aims to investigate the relationship between BMI and VD to assess whether VD screening is necessary prior to treatment for patients with obesity.
Methods: We conducted univariable, stratified, and multivariable analyses on clinical and biochemical data from 1,218 children seen in our university-based clinic between 2021 and 2024. We stratified patients by BMI (normal, overweight, obese and severely obese) and VD levels as categorical (normal, insufficiency, deficiency) and continuous variable.
Results: Using univariable and stratified analyses We found significant differences in VD deficiency (VDD) across BMI categories (normal, overweight, obese, severely obese), except the obese and severely obese groups. Patients with obesity and severe obesity showed higher frequencies of VDD (86.4% and 87%, respectively) compared to those with normal BMI (71.4%) and overweight BMI (82.4%). In the 2-5 age group, VDL did not significantly differ by BMI (21% VDD, P=0.651), but from ages 6-18, VDD rates increased (43% for 6-12, 52% for 13-18). Conducting multivariable analysis, we found females had lower VDL by 1.6 units across age groups compared to males. Ethnicity showed varied impacts: NHW and Asian children had no significant differences in VDL across BMI, age, or gender; black children had significant differences across all groups; and Hispanic children had significant differences in BMI and age categories. Using overall regression model, we identified age, gender, and BMI as significant factors affecting VD, with ethnic variation compared to NHW children.
Conclusions: Adolescents with severe obesity, particularly ages 6 and older, are at a notably higher risk for VDD. This risk highlights the necessity of proactive treatment for patients with severe obesity prior to VD screening in ages 6-18 and consistent monitoring of VDL across all BMI categories.

Conflict of Interest: No conflict of interest

Funding: Study is not funded

PO3.092

Spatiotemporal Assessment of Obesity Risk in Children and Adolescents in the Balearic Islands

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Introduction: Childhood and adolescent overweight and obesity remain significant public health challenges. In Europe, the prevalence of children living with excess weight has increased substantially. Data from the European Childhood Obesity Surveillance Initiative (COSI) identify Spain as one of the European Union countries with the highest prevalence of childhood overweight and obesity, alongside other Southern European nations. In the Balearic Islands, the second Prevalence Study on Childhood and Adolescent Obesity (EPOIB II) reported a prevalence of excess weight of 25.1% (14.7% overweight, 10.4% obesity), aligning with national figures. Excess weight in childhood and adolescence is associated with adverse adult health outcomes, such as asthma, heart disease, diabetes, and certain cancers, posing a substantial burden on healthcare systems. Understanding health-related behaviors, including diet, physical activity, and sedentary behavior, is essential. These behaviors are often framed as individual choices under the term "lifestyles," yet they are significantly shaped by environmental factors. Residential environments, in particular, can play a critical role in fostering or mitigating these behaviors, potentially influencing the epidemic of overweight and obesity in childhood and adolescence.
Objectives: To create a georeferenced database of the z-score of body mass index among children and adolescents assigned to the primary health zones of the Balearic Islands.
Methodology: Using anonymized data from the Child and Adolescent Health Program of the Balearic Islands and electronic medical records from the Primary Care Information System (e-SIAP), managed by the Balearic Islands Health Service, we constructed a retrospective cohort. The study included 44,062 children aged 2–14 years without obesity at baseline. Participants were followed until they developed obesity, turned 15, died, or the study concluded. Data were geolocated and aggregated by census tracts. Standardized incidence rates were calculated for each census tract and study year. Results were visualized using choropleth maps of standardized incidence rates.
Results: Between 2018 and 2022, the standardized obesity incidence showed a cumulative increase, starting with moderate rates in 2018 (maximum rate: 3.7) and peaking in 2020 (maximum rate: 11.1), followed by a gradual decline through 2022 (maximum rate: 8.0). Geographical spread intensified, with more regions showing high incidence rates.
Conclusions: The observed spatial and temporal patterns provide critical insights for identifying priority areas for intervention. These findings highlight the importance of targeted public health strategies and policies

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addressing the environmental determinants of obesity among children and adolescents. By leveraging spatial data, policymakers can implement more effective prevention and control programs tailored to the needs of specific regions, ultimately contributing to reducing the burden of childhood and adolescent obesity.

PO3.093

Subcutaneous and visceral adipose tissue lipidome in children reveals novel lipid species involved in obesity

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Introduction: Pediatric obesity has reached epidemic proportions globally. Adipose tissue serves as the primary endocrine organ for energy storage and plays a central role in regulating metabolism. Understanding how fat mobilization and remodeling adapt to obesity during infancy presents an opportunity to uncover novel insights into the development of metabolic diseases.
Methods: Thirty pediatric patients, both with and without obesity, were prospectively recruited from a single referral center. Clinical and anthropometric data were collected for all participants. Subcutaneous and visceral white adipose tissue (sWAT and vWAT, respectively) samples were obtained for lipidomic analysis to investigate differences in lipid composition.
Results: The analysis revealed significant modulation of novel lipid species in the sWAT of children with obesity compared to those with normal weight. These lipids were linked to beige adipose tissue development, energy metabolism, mitochondrial function, and oxidative stress. In vWAT, substantial alterations were observed in glycerophosphocholines, ceramides, and diglycerides, with an accumulation of lipid species associated with inflammation, insulin resistance, and cardiovascular risk. Additionally, correlations between sWAT and vWAT highlighted systemic dysregulation of lipid storage in childhood obesity, identifying both shared and depot-specific mechanisms of lipid metabolism.
Conclusion: The identification of critical lipid species associated with adipose tissue alterations in children with obesity provides valuable insights into the mechanisms underlying metabolic disturbances. This knowledge could pave the way for new approaches to prevent and treat metabolic diseases in pediatric populations.

PO3.094

Closing the Gap: Developing a Digital Therapy to tackle juvenile Obesity - KLAKSonline

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Background: The treatment of juvenile obesity is significantly constrained by a shortage of care centers, particularly in underserved regions with limited infrastructure and mobility. Digital, flexible, and location-independent training programs present promising solutions. However, there is a notable lack of evidence regarding conceptual frameworks and subsequent efficacy evaluations. To address this gap, this study seeks to design and establish a framework for a digital therapy program tailored to adolescents.
Methods: The theoretical foundation of this project was based on the Intervention Mapping framework [1]. Due to its limited specificity for digital implementation, the framework was expanded using didactic models [2], resulting in five dimensions and 14 guiding questions for designing digital therapy. These questions were addressed by considering national guidelines and existing literature on digital obesity interventions for adolescents.
Results: KLAKSonline builds upon the guideline-compliant obesity therapy framework established by the KLAKS Leipzig outpatient obesity center. It targets adolescents aged 13–17 affected by obesity and their parents, particularly from underserved areas. Prior to the program's start, an introductory week is conducted to familiarize participants with the technology and distribute participation packages, which include physical activity equipment and ensure the participation of all adolescents. This is followed by the mandatory 30-week multidisciplinary therapy phase. Of the 158 total units in the areas of nutrition, physical activity, behavior, and medical consulting, 89 consist of synchronous weekly videoconferences, while 69 asynchronous tasks are delivered through a learning platform. These tasks include 20 explanatory videos (∑55 min), 22 expert videos (∑104 min), and digital worksheets.
Discussion: Digital therapy requires changes in learning pathways and participant autonomy compared to analog formats. This is particularly evident in the reduced number of synchronous digital units, which are offset by asynchronous tasks to facilitate knowledge transfer into daily life. However, to evaluate feasibility and effectiveness of these digital modifications, future Randomized Controlled Trials should be conducted. Additionally, the digital competencies required by therapists must be investigated to develop suitable training and professional development programs for technical implementation. By addressing these aspects, the research aims to unlock the potential of digital interventions to enhance access to care and reduce healthcare disparities, particularly in underserved regions.

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PO3.095

"When I encounter walls of resistance, time's up just like that": Healthcare professionals' perceived barriers, facilitators, and their (inter)relationships in conversations with children with overweight and their caregivers – A qualitative study

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Background: Communication techniques play an important role in the healthcare for children with overweight. Despite its importance, healthcare professionals have described many barriers that are influencing the conversation about weight and lifestyle with parents and/or children with overweight. To gain insight into the needs of professionals who have an important role in the integrated care of children with overweight or obesity in the Netherlands, it is necessary to know their perceived barriers and facilitators, and their interrelationships, during weight- and lifestyle-related conversations.
Methods: Healthcare professionals in training to conduct a new role within healthcare for children with overweight or obesity (N=52), participated in focus groups (N=10) with participants distributed across these groups, following a semi-structured interview format. Interviews were transcribed and independently coded by two researchers into categories. Interrelationships between and within barriers and facilitators were determined, as well as key themes.
Results: Professionals are experiencing multiple barriers in communication about weight and lifestyle with children with overweight and their families. These barriers are mainly related to the family (child and/or parents), but also professional-related, interaction-related, and organizational-related barriers are found. Facilitators are found in these same categories. The professional-family relationship, time, attitude of both the family and professional, perceived knowledge of the professional, tools and materials, another subject as start of the conversation, expectations, a personalised approach and cultural factors, are determined as key themes.
Conclusion: Since multiple barriers are perceived in conversations about weight and lifestyle by professionals who play an important role in integrated healthcare for children with overweight, it is important to support professionals in these conversations. The current results could contribute to new understandings of education and training, adapted to the needs and experiences of professionals.

PO3.096

Reaching consensus on screening approaches and preventive lifestyle interventions for childhood overweight/obesity and metabolically unhealthy obesity in school settings: a Delphi method

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Introduction: School remains a suitable setting for implementing preventive strategies for childhood overweight/obesity (OV/OB) and robust methodological approaches are necessary albeit challenging. The present study aimed to elicit consensus on feasible and evidenced-based screening methods and characteristics of lifestyle interventions for the prevention of childhood OV/OB and metabolically unhealthy obesity (MUO) in school settings.
Methods: This work is part of the methodology applied in the HORIZON-funded project BIO-STREAMS. The modified Delphi method[1] was applied in two studies; one related to predictors and indicators for the screening of childhood OV/OB and MUO (S1) and one related to characteristics of lifestyle strategies for their prevention (S2). Relevant statements were derived from systematic reviews of the literature. Experienced health care professionals, educational personnel and researchers were identified via local networks and relevant scientific organisations across Europe. The Delphi process included two rounds. Participants assessed statements in a 5-Likert scale ("strongly disagree" to "strongly agree"). Agreement for each statement was defined by>75% of participants "agreeing or strongly agreeing" and variability of responses per statement as Interquartile Range≤1.
Results: Fourteen participants from 10 countries completed Round 1 (60 statements) and Round 2 (50 statement) of S1. Twenty participants from 8 countries completed Round 1 of S2 (45 statements) and 15 participants completed Round 2 (42 statements). Regarding S1 (agreement in 35/50 statements), important and feasible to assess predictors of childhood OV/OB in the school environment included (self-reported) physical activity (PA) and inactivity, foods/food groups intake, meal patterns, sleep habits and built environment components. Important and feasible to assess indicators of OV/OB were body mass index (BMI), BMI-z score, waist circumference and waist-to-height ratio. Regarding S2 (agreement in 35/42 statements), participants agreed that lifestyle interventions in schools can be delivered by a range of professionals after training; should last for ≥1 year; should include nutrition and PA education, experiential and policy components; should encourage a family-centric approach; and should utilise digital tools available in multiple devices and provide tailored feedback as complementary features. It was also agreed that lifestyle interventions for the prevention of childhood MUO in school settings should have the same general characteristics as those for the prevention of OV/OB; however, agreement was not reached on the feasibility of assessing MUO parameters.
Conclusion: Results from the current Delphi studies provide a guidance for the development of evidence-based and feasible screening approaches and preventive lifestyle interventions for childhood OV/OB in school settings.

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PO3.097

Understanding hypertrophic adiposity in children through spatial transcriptomics

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Introduction: Obesity is characterized by an excessive accumulation of fat mass and is often associated with adipose tissue dysfunction. It is especially worrying in children because it leads to earlier onset and heightened severity of associated comorbidities, such as type 2 diabetes and cardiovascular disease, ultimately reducing life expectancy. In childhood obesity, the expansion of the white adipose tissue (WAT) is mostly accomplished through hypertrophy (an increase in adipocyte size). In turn, hypertrophic adiposity is strongly associated with adipose tissue inflammation, insulin resistance, and diabetes.
Our study aims to investigate potential molecular signals associated with hypertrophy during the development of childhood obesity.

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Methods: Specifically, we collected subcutaneous WAT biopsies from children with obesity and their age-matched normal-weight controls (N=8; 4 Control + 4 OB; ages 4-12). We utilized the VISIUM-10X Genomics platform to embed samples, generate cDNA, and prepare the libraries for sequencing.
Results: Children with obesity exhibited hyperglycemia, moderate hyperinsulinemia, and high circulating TAG and cholesterol levels. Likewise, the WAT from children with obesity was already hypertrophic. A preliminary cell atlas based on gene expression profile revealed 4 distinct adipocytes types, immune cells, and fibroblast cells, including pre-adipocyte-like cells. As expected, in the adipocyte fraction we found increased expression of lipogenic markers, which might potentially support adipocyte expansion and hypertrophy.
Conclusions: Ongoing-preliminary findings will be discussed, including the methodological specific modifications required for processing white adipose tissue samples.

Conflict of Interest: None disclosed

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PO3.098

Time-trends in the adiposity and fat distribution among children and adolescents from Kraków (Poland) since the beginning of the 21st century (from 2000 to 2020)

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Introduction: Changes in the level of fatness and its distribution in children and adolescents at the beginning of the 21st century are an important multifaceted problem. The study aimed to assess the changes in the skinfold thickness and fat distribution in children and adolescents aged 8-18 from Kraków, Poland.
Methods: The study group (8 500 children) consisted of the results of three cross-sectional studies (2000, 2010, 2020). Analysed parameters included five skinfolds (triceps, subscapular, abdominal, suprailiac, calf), their sum, limbs-to-trunk and trunk adiposity indicators. A statistical analysis was performed to compare the differences between groups using two-way ANOVA with the Tukey HSD test or Kruskal-Wallis test.
Results: In both sexes, the triceps skinfold decreased, while the subscapular skinfold increased in most age groups. The abdominal skinfold increased, but in girls only younger groups. The suprailiac and calf skinfold changes varied, depending on sex and age. The sum of skinfolds increased in boys, but in older girls had a negative trend. The trunk adiposity index had a negative trend only in younger girls, while the limbs-to-trunk adiposity index increased across all ages, same as in boys.
Conclusion: There was a trend towards central fat allocation, despite a decrease in skinfold thickness in some groups. This is concerning as central adiposity is associated with an increased risk of many diseases. There were also differences between sexes, with girls more likely to control body weight through dietary restrictions and boys exhibiting less favourable dietary habits. Thus, body image dissatisfaction and societal pressure may contribute to these behaviours.

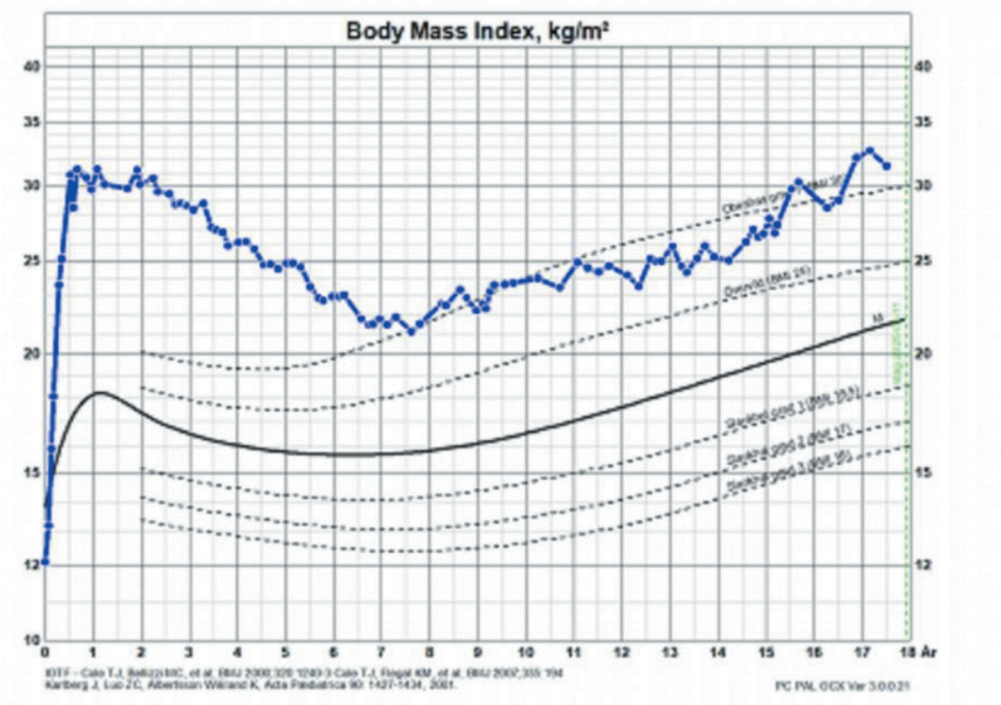
PO3.099

Adding glucagon-like peptide-1 receptor agonists to long-term lifestyle treatment in two children with leptin receptor deficiency

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Introduction: Children with a mutation in the gene coding for the leptin receptor (LEPR) have marked hyperphagia and develop severe obesity in their first years of life. The precision drug setmelanotide is not yet reimbursed in Sweden. We added glucagon-like peptide 1 receptor agonists (GLP-1) to 15 years of intense lifestyle treatment.



BMI chart of the older patient

Fig. 1. Childhood BMI in a child with LEPR deficiency.

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Methods: Case report. We present 16-years follow-up from two brothers with homozygous mutations (c.1226C>A) in LEPR.
Results: When diagnosed with monogenic obesity (LEPR deficiency) at ages 3 and 5 years, the children were already in intense lifestyle treatment since age 1 and 2 years due to early onset obesity. The parents were encouraged to use calorie-counted, on-the-clock meal regimens. The parents promoted daily physical activity, such as going straight to the playground from preschool, and encouraging outdoor play and limiting screen time at older ages. The aim was to "keep the weight while growing", and the family weighed and noted their children's weights at home at regular intervals, often weekly, and regularly came to the clinic, 6–8 times a year. Cooperations were established with daycare, schools and the extended family. Extensive support was provided from a multi-disciplinary paediatric obesity team at the National Childhood Obesity Centre. Weight and BMI were successfully and gradually reduced from very high BMI in the first years of life (28–30 kg/m2) to BMI:s corresponding to overweight or obesity grade 1 from age 7 years and onwards. The patients are approaching final height, and it is above or close to target height. In 2024, GLP-1 was added to help the patients keep their strict regimen and was regarded as helpful by the patients and their families.
Conclusion: A childhood intensive lifestyle treatment was successful for two patients with LEPR deficiency, now 16.5 and 18 years old. However, the strenuous and continuous adherence to a treatment regimen was not without difficulties. Novel drugs such as setmelanotide targeting the melanocortin-4 -receptor could help patients maintain successful weight control in adulthood. With setmelanotide not yet reimbursed, we used GLP-1 that was reported to assist the patients in keeping their strict lifestyle regimen.

PO3.100

High birth weight is associated with obesity in children and adolescents

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Introduction: Adverse early life exposures might negatively affect fetal and infant development, predisposing children to obesity throughout life. There is growing evidence that certain perinatal factors, including high birth weight (HBW), may be associated with a higher risk of obesity later in life. We conducted a meta-analysis to understand the association between HBW and obesity in children and adolescents.
Methods: We selected and extracted data from longitudinal studies that evaluated and defined HBW (percentile>90th or HBW> 4000g) with obesity (percentile> 95th) later in children and adolescents. Random effects models were used to estimate pooled odds ratio (OR) and 95% confidence interval (CI) for obesity. Heterogeneity was assessed with the Q-test and the I2 statistic, representing the total variation across studies that can be attributed to heterogeneity. P value below 0.05 was considered statistically significant.
Results: 13 articles were included in meta-analysis. Compared to children born with normal weight, HBW exhibited 1.59-fold higher systolic blood pressure or risk of develop hypertension (95% CI: 1.48-1,71, $p < 0.01$).
Conclusion: HBW is associated with obesity in children and adolescents. These findings are relevant for early life risk prediction and insight into the strongest potential modifiable factors from a clinical, governmental, and industrial perspective. These relevant results point to the presence of a potentially vulnerable subgroup of children and adolescents, for which screening tests and early preventive strategies could be beneficial.

Conflict of Interest: None Disclosed

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PO3.101

Examination of emotional eating behaviors and nutritional statuses of adolescents residing in institutions affiliated to the ministry of family and social services of The Republic of Türkiye

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Introduction: Risk factors for emotional eating include personality and physical and emotional development during adolescence. In addition, parenting styles and lack of attention and love in the parent-child relationship are other factors that affect emotional eating. In Türkiye, some of the adolescent children are placed in orphanages by the state for reasons such as socioeconomic conditions and absence of family. The aim of this study was to investigate the emotional eating behavior and the nutritional status of the adolescents who are staying in the children's homes, which is one of these institutions.
Materials-Methods: The study was conducted between April and May 2022 with 150 adolescents, 75 girls (50%) and 75 boys (50%), between the ages of 10-18 years in 3 institutions affiliated to the Ministry of Family and Social Services in Istanbul, Türkiye. In the questionnaire form; demographic information, eating habits, food consumption frequency form, 3-day retrospective food consumption record and Emotional Eating Scale - Child and Adolescent Form (EES-C; 25-125 points) were collected face to face by the researcher.
Results: The mean emotional eating score was 56.91 ± 19.34 and did not differ by gender ($p>0.05$).The depressive symptom score, one of the sub-dimension scores of the scale, was significantly higher in boys (11.4 ± 5.36) than in girls (9.6 ± 4.16) ($p<0.05$). Emotional eating scores increased with increasing daily intake of energy ($r= 0.204$, $p= 0.012$), protein ($r= 0.191$; $p= 0.019$) and carbohydrate ($r= 0.232$; $p= 0.004$) in adolescents. As the BMI percentile value increases, the restless mood score increases ($r= 0.162$; $p=0.048$). It was found that the mean restless mood and emotional eating scores of adolescents with ≥ 95th or ≥ 97th percentile category were higher than the other percentile categories (except thin) ($p<0.05$).
Conclusion: The growth chart of the adolescents were not affected and the EES-C scores were at an average level. In this context, it is recommended that adolescents staying in children's homes should be followed up regularly in the future to prevent any health problems.

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Tab. 1. Distribution of Emotional Eating and Subscale Scale Scores by BMI Percentile Categories.

Scales	BMI Percentile Categories	N	X	ss	F	sd	p	Significant Difference
Emotional Eating Total Score	<3 or <5 Percentile	4	68,5	12,12	2,805	4/145	0,028*	5>2
	≥ 5 - < 15th Percentile	6	45,3	23,22				5>3
	≥15 - < 85th Percentile	93	55,18	18,09				5>4
	≥ 85 - < 95th Percentile	28	55,92	15,20				
	≥ 95th or ≥ 97th Percentile	19	68,05	26,10				
Restless Mood Score	<3 or <5 Percentile	4	36	6,63	2,864	4/145	0,025*	5>2
	≥ 5 - < 15th Percentile	6	23,66	11,07				5>3
	≥15 - < 85th Percentile	93	29,30	9,90				5>4
	≥ 85 - < 95th Percentile	28	29,85	8,09				
	≥ 95th or ≥ 97th Percentile	19	36,31	13,72				
Anxiety-Anger-Disappointment Score	<3 or <5 Percentile	4	17,25	3,59	2,199	4/145	0,072	
	≥ 5 - < 15th Percentile	6	11,33	5,64				
	≥15 - < 85th Percentile	93	13,30	4,67				
	≥ 85 - < 95th Percentile	28	13,53	4,13				
	≥ 95th or ≥ 97th Percentile	19	16,15	6,92				
Depressive Symptom Score	<3 or <5 Percentile	4	11,75	4,57	1,629	4/145	0,170	
	≥ 5 - < 15th Percentile	6	8,66	6,25				
	≥15 - < 85th Percentile	93	10,29	4,76				
	≥ 85 - < 95th Percentile	28	9,96	3,94				
	≥ 95th or ≥ 97th Percentile	19	12,94	5,83				

One Way Anova Test *p <0.05

PO3.102

Longitudinal Relationships Between Physical Fitness and Body Composition and in Preschool Age and Glucose Levels in Adolescence: preliminary findings from the PREFIT-UP Project

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Introduction: Physical fitness is a powerful marker of health in children and adolescents. However, its predictive role in cardiometabolic outcomes, such as glucose levels from preschool to adolescence age, is not well understood. Therefore, this study aimed to examine the longitudinal associations between physical fitness and body composition in preschool children and their glucose levels measured during adolescence.
Methodology: This study is part of the PREFIT-UP project, which aimed to explore the longitudinal associations between physical fitness and body composition in preschool-aged children and cardiometabolic health and emotional well-being in adolescence. A subsample of 162 children (92 girls; baseline age: 4.5 ± 0.8 years; follow-up: 12.0 ± 0.8 years) from Vitoria, Spain, was included. In 2014-2015, physical fitness was assessed, using the PREFIT battery, which includes tests for cardiorespiratory fitness (20 m shuttle run test), muscle strength (handgrip strength and standing long jump tests), and speed-agility (4 × 10 m shuttle run test). Body anthropometrics was also measured using body mass index (BMI) and waist circumference. During the follow-up (2022-2023), 24h, daytime- and nighttime-glucose levels were continuously monitored over a 7-day period using the FreeStyle Libre Pro system (Abbott). Linear regression models, adjusted for age, and stratified by sex, were performed to examine the associations between physical fitness and body composition in preschool-aged children and their glucose levels in adolescence.
Results: None of the physical fitness components (i.e., cardiorespiratory fitness, muscular strength, or speed-agility) in preschool-aged children showed significant associations with 24h, daytime- or nighttime-glucose levels measured after 7.5 years of follow-up for boys (all standardized $\beta < 0.284$, $p > 0.05$) or girls (all standardized $\beta < 0.039$, $p > 0.05$). Similarly, no significant associations were found between BMI or waist circumference and glucose levels after 7.5 years of follow-up for boys (all standardized $\beta < 0.293$, $p > 0.05$) or girls (all standardized $\beta < -0.039$, $p > 0.05$).
Conclusion: This study found no significant associations between physical fitness and body composition in preschool-aged children and continuously monitored glucose levels in adolescence. Therefore, early interventions targeting physical fitness or body composition may not directly influence long-term glucose regulation, suggesting the need to explore other early-life factors or mechanisms that contribute to metabolic health during adolescence.

PO3.103

Evaluation of the relationship between nutrition literacy levels and body mass index of high school adolescents

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Introduction: Adolescence is considered the process of developing health conditions with chronic disease risks. Studies conducted in this age group show that adolescents are not able to apply adequate and balanced nutrition in their lives. The term nutrition literacy is used to describe the

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competence on which healthy eating behavior depends. Positive effects of nutritional literacy have been found to create lifestyle and healthy eating awareness. The aim of this study was to evaluate the relationship between the nutritional literacy status of high school adolescents and their body mass index (BMI).

Materials-Methods: The study was conducted between December 26, 2022, and March 30, 2023, with a total of 400 high school-aged adolescents, 225 girls (56.3%) and 175 boys (43.8%), between the ages of 15 and 18, residing in the Tuzla district of Istanbul. The nutritional literacy status of the adolescents was determined using the Adolescent Nutrition Literacy Scale (ANLS; 22-110 points). Demographic information, anthropometric measurements, dietary habits, and food consumption records of the individuals were obtained with an online questionnaire form.

Results: The mean BMI for male and female adolescents was 21.1±3.6 kg/m² and 22.8±4.5 kg/m², respectively. The ANLS scores of the adolescents were 67.90±13.84 (intermediate) (girls= 69.37±12.60, boys= 66.00±15.13: p<0.01). The ANLS scores of adolescents whose source of information in obtaining opinions about healthy eating was a health care provider (dietician, doctor) were higher (70.40±13.53) compared to those whose source of information was parents (64.51±13.61) (p<0.001). Adolescents with obesity had the lowest score, but there was no significant difference between the adolescents' BMI and their ANLS scores (p>0.05).

Conclusion: Healthy eating habits acquired during adolescence improve the quality of life in adulthood. Rapidly increasing obesity during this period brings many complications. The nutritional literacy of adolescents and their parents can be improved by providing nutrition education by dietitians.

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Conflict of Interest: None Disclosed

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Tab. 1. Distribution of Adolescents' Nutrition Literacy Scores According to Body Mass Indexes.

Percentile Range Values	Nutrition Literacy Scores (X±SS)	p
< 3rd Percentile	69,35±13,98	
3rd - 15th Percentile	67,29±13,88	
15th - 85th Percentile	67,72±12,94	0,172
85th - 95th Percentile	71,08±15,73	
> 97th Percentile	63,89±15,83	

*One-Way Anova test

PO3.104

Adherence to dietary recommendations is low regardless of weight in Finnish elementary school-aged children with normal weight and overweight/obesity

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Introduction: Recommended diet has been demonstrated to reduce the risk of obesity and other lifestyle diseases. Consumption of vegetables, fruits and berries, fish, fat-free dairy and vegetable fat can be used as simple indicators of a health-promoting diet as they are central food groups linked with health, and therefore their consumption is promoted in the dietary recommendations. Timely information on whether dietary habits of Finnish elementary school-aged children meet the national dietary recommendations is scarce. The aim of this study was 1) to investigate the extent to which the dietary habits of Finnish elementary school-aged, i.e. 7–13-year-old, children are in accordance to that recommended and 2) to assess whether the dietary habits differ between children with normal weight and overweight/obesity.

Methods: Families with elementary school-aged children were recruited in Southwest Finland and Eastern Finland using a random sample of the age group drawn from the Finnish Population Information System. Children filled in a food frequency questionnaire inquiring about the consumption of foods with the help of their parents in a study visit. The consumption of selected foods, i.e. diet quality components, was compared with the dietary recommendations. The diet quality components analysed were: consumption of vegetables, fruits and berries daily or at least five portions per day, consumption of fish at least two portions a week and the choice of fat-free milk or vegetable oil -based spread with fat content of at least 60% instead of other options. Children's weights and heights were measured in the study visit, and overweight/obesity status defined using national growth charts.

Results: A total of 268 children (47% girls) with a mean age of 9.7±1.7 were enrolled in the study. Of the children, 79% (211/267) had normal weight and 21% had overweight/obesity. Half of the elementary school-aged children (50%, 134/267) consumed vegetables, 33% (88/268) consumed fruits and 3% (7/265) consumed berries daily. Twelve percent of the children (31/268) met the recommendation of eating vegetables, fruits and berries at least five portions per day. Of the children, 35%, (94/266) consumed fish at least two portions a week, 55% (148/267) consumed fat-free milk and 38% (101/267) consumed vegetable oil-based spread on bread according to the recommendations. There were no statistically significant differences in the consumption of diet quality components between children with normal weight and overweight/obesity.

Conclusion: A low proportion of the elementary school-aged children adhered to the dietary recommendations as assessed using diet quality components. Particularly, the consumption of vegetables, fruits and berries was low among the children. No differences were detected between children with normal weight or overweight/obesity. Enhanced family-centered dietary counselling is needed to improve the children's dietary habits regardless of their weight.

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PO3.105

Analysis of nutritional behavior and lifestyle in children and adolescents with obesity - preliminary results

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Introduction: Childhood obesity is a multifactorial disease, but bad habits undoubtedly play the greatest role in its development and progression.
Methods: The aim of the study was to assess the habits of children and adolescents with simple obesity reporting for their first visit to the Interclinical Center for the Treatment of Childhood Obesity at the University Children's Hospital in Krakow. The study included 55 participants, aged from 5 to 17, average 13,5).
Results: Despite the fact that obesity has been present for many years, for 40% of patients it was their first contact with a specialist related to this disease, however, 70% attempted to reduce their body weight. 36% of the respondents never eat breakfast, 54% do not have set meal times, 37% snack late in the evening or at night, 43% do not consume an adequate amount of fluids during the day, the same number willingly consume sweetened beverages every day. Only 1/3 of the respondents declared eating a portion of vegetables at least 3 times a day, and as many as 2/3 eat unhealthy snacks more than three times a week. 70% of the respondents spend more than 2 hours of their free time sitting every day, a similar percentage declare using screen devices for more than 2 hours a day. However, only 36% are provided with daily physical activity (>60 min.). 92% of the respondents declare family support in treating obesity, but as many as 54% admitted that they experienced violence or stigmatization in their environment due to obesity. 96% of the study participants declare their willingness to undergo treatment and change their lifestyle.
Conclusion: Despite awareness of the importance of changing habits for the healthier, support from family members and attempts to lose weight in the past a significant number of patients unable to implement changes on their own. The most important problems seem to be the use of screens, a sedentary lifestyle and irregular eating, including skipping breakfast.

PO3.106

The Role of Nutritional Intervention in a Multidisciplinary Approach to Pediatric Obesity Management: A Case-Based Study

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Introduction: This study evaluates the effectiveness of an integrated intervention program designed to manage pediatric obesity and its associated comorbidities. The program incorporates a personalized approach, including balanced nutrition, psychological support, and continuous medical monitoring. The objective was to address both physical and emotional aspects of obesity, aiming to reduce health risks and enhance overall well-being.
Materials and Methods: The medical records of children with obesity, evaluated by a registered dietitian and nutritionist over one year (2023–2024), were reviewed. Six records, representing severe cases, were selected for this case series. Body composition was assessed using the InBody J30 device.
Each child received a personalized treatment plan developed by a multidisciplinary team, including dietitian, psychologists, endocrinologists, cardiologists, and pediatricians.
Interventions included: balanced Nutrition: diet plans avoided strict calorie counting to reduce food-related anxiety, supplements: vitamin D, omega-3, and magnesium; psychological support; continuous monitoring: regular assessments tracked physical and emotional progress, with family involvement.
The treatments emphasized sustainability, integrating education on healthy eating and lifelong behavioral change.
Results: The intervention led to significant physical and emotional improvements across all cases:

- Case 1: A 12-year-old boy with severe obesity, metabolic comorbidities, and epidermolysis bullosa (BMI: 32.7, fat percentage: 40%). After six months, his BMI decreased to 28.6 and fat percentage to 28.6%, with improved skin condition and intestinal health.
- Case 2: A 12-year-old girl with insulin resistance and menstrual irregularities (BMI: 31, fat percentage: 34.7%). Nine months of treatment reduced her BMI to 29.7, normalized her menstrual cycle, and improved emotional balance.
- Case 3: A 12-year-old boy with insulin resistance and low self-esteem (BMI: 22.1, fat percentage: 39.7%). After one year, his BMI dropped to 18.5 and fat percentage to 26.7%, with enhanced emotional well-being.
- Case 4: A 10-year-old girl with social isolation and emotional imbalances (BMI: 34, fat percentage: 47.2%). Six months of treatment reduced her BMI to 27.1 and fat percentage to 41.6%, alongside better social integration and emotional health.
- Case 5: A 10-year-old boy with kyphotic posture and acanthosis nigricans (BMI: 32.8, fat percentage: 48%). Treatment reduced fat percentage, improved posture, and boosted self-confidence.
- Case 6: A 15-year-old girl with severe obesity and emotional challenges (BMI: 43). Comprehensive treatment achieved significant weight loss, hormonal balance, and emotional stability, including reduced suicidal tendencies.

All cases reported reduced cravings for unhealthy foods and better eating habits.
Conclusion: This study highlights the success of a personalized, multidisciplinary approach in managing pediatric obesity. Results demonstrated physical improvements, such as reductions in BMI and fat percentage, as well as emotional gains, including enhanced self-esteem and reduced social isolation.

PO3.107

Relationship between the pro-inflammatory state, serum adipokines and insulin resistance in Algerian adolescents with obesity or overweight

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Introduction: Adipose tissue, closely linked to insulin resistance, produces hormones called adipocytokines such as: adiponectin and leptin. Adiponectin, a protein in nature, made up of 247 amino acids, has an action which involves the activation of the enzyme. responsible for the exercise insulin-sensitizing properties of biguanides, and for certain effects of thiazolidinediones. Leptin is of protein made up of 167 amino acids is also called satiety hormone and is associated with body mass index. Its stimulants are overfeeding, insulin and glucocorticoids, while its inhibitors are fasting and adrenergic agonists. it has been described that adipose tissue causes a pro-inflammatory state that can be assessed by C reactive protein CRP.
Objectives Ar:

- Study variations in leptin, adiponectin and insulin resistance (HOMA index) in adolescents with obesity or overweight aged 16 to 19.
- Establish a correlation between CRP, leptin and adiponectin in adolescents living with obesity or overweight aged 16 to 19.

Materials-Methods: Biological assays and anthropometric measurements were carried out in 145 adolescents including 112 girls and 33 boys.

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108 with overweight, BMI between 25-29.9 Kg/m² and 27 living with obesity, BMI > 30 Kg. /m².. Leptin and adiponectin are determined by ELISA method, CRP by method turbidimetric, blood glucose by colorimetric enzymatic method while insulinemia is measured by chemiluminescence. The samples are taken on an agar tube in the morning on an empty stomach. HOMA IR = Fasting insulin (uUI/ml) x fasting blood glucose (mmol/l)/22.5.

Results: In adolescents with overweight (84 girls and 24 boys), the average adiponectin is 12.83ng/ml in girls and 13.65ng/ml in boys. The average HOMA IR value is 3.74 in girls and 4.49 in boys. The average leptin value is 21.21ng/ml in girls and 6.64 ng/ml in boys. The average value of CRP is 2.22 mg/l in girls and 1.57 mg/l in boys.

In adolescents with obesity (18 girls and 09 boys), the average adiponectin is 11.81ng/ml in girls and 13.56ng/ml in boys. The average value of HOMA IR is 3.72 in girls and 4.68 in boys. The average leptin value is 29.16ng/ml in girls and 14.12ng/ml in boys. The average CRP value is 3.19mg/l in girls and 3.11mg/l l in boys. A positive correlation is found between CRP and the two adipokines (leptin and adiponectin).

Conclusion: The results of this work show a close relationship between CRP as pro-inflammatory markers and the adipokines measured (leptin and adiponectin). This relationship would increase cardiovascular risk towards adulthood. Reducing adipose tissue may be an effective solution to reduce this condition and this risk, hence the need for prevention programs at a very young age.

PO3.108

A Post Hoc Subgroup Analysis of an Obesity Prevention Intervention for Children Susceptible to Obesity: The Healthy Start Study

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Introduction: This study investigated potential subgroups of children within the Healthy Start Study for differing intervention effects on BMI Z-score and Fat Mass at follow-up. Conducted in Greater Copenhagen, the Healthy Start Study aimed to prevent excessive weight gain among children with a healthy weight who were susceptible to obesity through a multicomponent intervention. While the original study found no overall differences in BMI Z-score between intervention and control groups at follow-up, subgroup variations in intervention effects were suggested.

Methods: Data were collected for children aged 2 to 6 years (n = 543) between 2009 and 2011, with a mean follow-up time of 1.3 years. Eligibility included children with a healthy weight, excluding those identified as having overweight at baseline. The intervention delivered tailored family consultations focusing on diet, physical activity, sleep, and stress reduction. The present study conducted a post hoc subgroup analysis, using a generalized linear model to investigate BMI Z-score and Fat Mass at follow up as outcome measures. The model included an intervention-subgroup interaction term and covariates such as total energy intake and baseline BMI Z-score and Fat Mass.

Results: No significant or consistent trends for differential intervention effects by subgroup were observed for BMI Z-score or Fat Mass. However, for some physical activity measures, the intervention group experienced a lower BMI Z-score and Fat Mass compared to the control group, though these differences were not statistically significant.

Conclusion: The intervention did not produce consistent subgroup differences in BMI Z-score or Fat Mass. While the intervention delivered in the Healthy Start Study did not achieve a lower increase in BMI Z-score overall, it also did not highlight inequalities in intervention effects among children susceptible to obesity.

PO3.109

Breaking barriers: tackling childhood obesity through early intervention and systemic family support

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Background: Childhood obesity in the UK is a public health crisis linked to adult obesity.[1] Socioeconomic and ethnic disparities, driven by systemic inequities like deprivation and physiological factors, exacerbate the issue.[2] The financial burden is substantial, with rising demand for Tier 3 and bariatric interventions. Southeast London reports higher childhood obesity rates than national averages,[2] leading to the launch of the Greenwich Children and Young People's Tier 3 Weight Management service. This study evaluates the impact of addressing childhood obesity as a systemic family issue on health outcomes and wellbeing.

Methods: 148 participants were referred to Tier 3 in Greenwich for 12-months, undergoing assessments by a paediatrician, a senior social worker, dietitians, counsellors, physical activity specialists, and a youth worker. Key Performance Indicators focused on behavioural, quality of life, and activity improvements, rather than weight loss. Programme evaluation included feedback questionnaires, digital surveys, and patient participation groups.

Assessments included:

- Adolescents: Warwick-Edinburgh Mental Wellbeing Scale (WEMWS)
- Children under 12: Stirling Children's Wellbeing Scale (SCWS)
- Eating behaviours: 10-item questionnaire at assessment and discharge
- Activity levels: 7-question survey on structured activity, confidence, and functional ability
- Weight and BMI were recorded at baseline and monitored monthly

Results: 105 participants engaged (71%) with a majority being 9–15 years old. Among them, 55% were male, 69.4% resided in deprived areas, and 38.9% identified as Black or of mixed Black heritage. Complex needs were common: 32% had conditions such as ASD (21.9%) or ADHD (5.7%), and 58% had at least one long-term condition, including asthma (17%) or mental health diagnoses (15.2%). Adverse family circumstances, such as parental absence or overcrowding affected 53%, and 58% of families reported a history of obesity. Mental wellbeing improved for 66.7% of families completing the WEMWS, and completed SCWS's also showed improvements. Eating behaviours showed reduced intake of sugary drinks (45.4%) and fried foods (54.5%). Respondents rated interactions with dietitians and counsellors as "good" or "excellent", and 88% of children enjoyed the programme. Behavioural changes in food and physical activity were observed in 21–32% of families.

Conclusion: These findings underscore the urgent need for early, family-centred interventions to address childhood obesity within family structures. Multidisciplinary programmes could mitigate the growing physical, emotional, and financial toll on children, young people, and the NHS.

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PO3.110

Feasibility and reproducibility of a school-based protocol measuring energy balance related behaviors and obesity among adolescents with contrasting socioeconomic status

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Introduction: Adolescents with obesity face increased health risks in both the short and long term, further exacerbated by a higher likelihood of becoming adult with obesity. Obesity is strongly socially determined with prevalence being higher in disadvantaged populations compared to advantaged ones. Despite this, few protocols to assess energy balance related behaviors (physical activity 'PA', sedentary behaviors 'SB', diet, and sleep) have been validated in adolescents. To our knowledge, no prior studies have compared survey tools validity across the socioeconomic statuses (SES).

The main objective of this study was to evaluate the feasibility and reliability of a school-based protocol to assess energy balance related behaviors among adolescents and further compare the results by school SES.

Methods: Three schools were randomly selected in the south-east of France: two from the lowest 10% SES category (mean SES = 4.9) and one from the highest 10% (mean SES = 10.15). SES range from 0 (lowest) to 15 (highest).

The protocol was conducted among 7th-grade students (around 12) during Life Sciences lessons. First, under the supervision of a teacher and researcher, participants filled a concise and comprehensive online questionnaire assessing height, weight, PA, SB, sleep and diet. Second, a subsample of participants was proposed to wear an accelerometer on their non-dominant wrist for 7 days to objectively measure PA, SB and sleep. The protocol included a test-retest design, with a 15-day interval, to evaluate the reliability of instruments across the two time points. Feasibility and reproducibility were assessed through Intra-Class Correlation (ICC) analysis of questionnaires and accelerometers and combined with qualitative observations. ICC values, ranging from 0 (lowest) to 1 (highest), indicate stability and were compared by SES.

Results: Data were collected in 2024. Participation rate was 72.6% (n = 215) while acceptation rate for wearing the accelerometer was 68.6% (n = 70) with higher adherence observed in low SES schools (81.4%).

Overweight or obesity prevalence was 6.6% in high SES school and 19.8% in low SES schools.

ICC values showed good test-retest reliability for socio-anthropometric and sleep data, (e.g., body mass index: 0.71). Reliability for diet and PA varied by school type: sedentary behaviors were more reliable in low SES schools (e.g., screen time: 0.61 vs. 0.43), while PA and diet were more reliable in high SES schools (e.g., breakfast: 0.81 vs. 0.66). Accelerometer ICCs were above 0.65, except for average METs per week in low SES schools (0.13 vs 0,69).

Conclusion: This protocol was feasible and reliable for 7th-grade students, with questionnaire and accelerometer ICCs comparable to other validated survey tools.

This is the first study to show similar validity among adolescents from both very low and high SES background, further encouraging its use in representative studies or to evaluate the social determinants of health in adolescence.

PO3.111

Training healthcare professionals to manage childhood obesity: a scoping review of educational interventions

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Introduction: Healthcare professionals (HCPs) play a key role in prevention, screening, clinical assessment and treatment of child and adolescent obesity (CAO). Addressing obesity requires educational interventions for HCPs at undergraduate and post-graduate level but data on this is limited1 This review aimed to identify studies on CAO educational interventions for HCPs and to evaluate their impacts on skill, knowledge, attitude and behaviours in CAO management.

Methods: Following the JBI approach2 and PRISMA guidelines, a librarian and two researchers conducted a systematic search in PubMed and CINAHL.

Studies included involved qualified HCPs, addressed training for CAO management and reported on the type, delivery, content of interventions and/or assessed the impact of training on HCP's learning, skills, attitudes, or behaviour. Data was charted based on study and intervention characteristics, and study outcomes evaluated against the Kirkpatrick model3. The MERSQI and Newcastle Ottawa Scale (NOS) were used to assess methodological quality of the studies4 Study impacts were described by thematically analysing qualitative findings and narratively synthesizing quantitative findings.

Results: Of 431 potential titles, 6 studies were eligible for review. Studies were conducted in the United States and Australia (83%), delivered in-person (83%) or online (17%). Training content incorporated using clinical guidelines for CAO management, growth monitoring, training related to behavioural counselling and advocacy to promote obesity prevention. Study outcome assessment addressed levels one to three of the Kirkpatrick Model. All studies described improvements post-training intervention, with increases reported in participant's confidence, knowledge, skills, and behaviors in CAO prevention and treatment. The two high-quality studies uniquely observed positive HCP clinical behaviour changes, where participants displayed improved documentation of child weight status and readiness to change in clinical encounters.

Conclusion: Few studies exist evaluating training interventions for HCPs in CAO management, though emerging data suggests that higher quality studies result in positive impacts for HCPs. Future studies should incorporate rigorous study designs targeting all levels of the Kirkpatrick model in order to measure impact on learning, behaviour and patient care.

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PO3.112

Obesity greatly amplifies the magnitude of the association between the p.I148M polymorphism of PNPLA3 gene and liver steatosis in chilean adolescents

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Introduction: Steatotic Liver Disease (SLD) is a chronic liver disorder characterized by hepatic fat accumulation in more than 5% of hepatocytes, which can progress to fibrosis or liver cirrhosis. In Chile, its prevalence among adolescents, assessed by ultrasonography, is nearly 10%. The causes of SLD are multifactorial, including obesity and genetic susceptibility. Previous studies showed a strong association between the p.I148M polymorphism (substitution of isoleucine for methionine at amino acid position 148) of the PNPLA3 gene and liver fat content in different populations.
Aim: To evaluate the interaction between obesity and the p.I148M polymorphism of the PNPLA3 gene on the occurrence of SLD in Chilean adolescents
Methods: Participants (n=784) from a population-based study in Santiago (Chile). Body Mass Index (BMI) z-score was repeatedly measured during childhood and adolescence. Abdominal ultrasounds were performed to evaluate the presence of liver steatosis in adolescents aged 13-17 years. Participants were also genotyped for the p.I148M variant of PNPLA3 as part of the genome-wide MEGA-Illumina array (>1.7 million measured gene variants). Multiple logistic regression models were used to assess the association between the p.I148M polymorphism and BMI z-scores with SLD, as well as statistical interactions.
Results: There was a strong cross-sectional association between adolescent BMI z-score and SLD after adjusting by age, sex, and three principal components for ethnicity (Odds Ratio; OR: 4.4; 95% Confidence Interval; CI: 3.1-6.1; p<0.001). After adjusting for BMI z-score and relevant covariates, no statistical significance was found for the association between the p.I148M variant of the PNPLA3 gene and SLD (OR: 1.6; 95%CI: 0.7-3.6; p=0.27). A significant interaction effect was found between the p.I148M variant and adolescent BMI z-score (p=0.01). Obesity at adolescence (defined as a z-score BMI >2) greatly amplifies the genetic risk of the p.I148M variant on SLD (OR: 14.8; 95% CI: 5.4-40.6 for carriers of the p.I148M variant with obesity compared to non-carriers normal-weight participants).
Conclusion: We found a significant statistical interaction between the p.I148M variant of the PNPLA3 gene and the BMI z-score in developing hepatic fat accumulation during adolescence. The presence of obesity greatly amplifies the magnitude of the association between the p.I148M variant of the PNPLA3 gene and SLD compared to normal-weight participants without the genetic variant.

PO3.114

Western diet, overweight and obesity increase the risk and progression of steatotic liver disease associated with metabolic dysfunction

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Introduction: The Western diet, widely adopted by the young population and characterised by a high consumption of ultra-processed foods, significantly increases the risk of obesity and other metabolic diseases related. Among these, metabolic dysfunction-associated steatotic liver disease (MASLD), a pathology of high global prevalence, standing out children and adolescents. MASLD is closely linked to obesity, which highlights the need to tackle this problem through prevention based on a healthy lifestyle with special emphasis on nutrition. The Mediterranean diet has been shown to be highly effective in reducing the incidence and progression of MASLD, however, the high consumption of ultra-processed foods among the younger population represents a major priority challenge in tackling MASLD. The aim of this study was to analyse the degree of MASLD in a population of children and adolescents in Area III de Salud de Murcia (Lorca) and its distribution according to socio-demographic indicators such as origin, educational level and income level, as well as to evaluate anthropometric parameters and basal blood biomarkers.
Methods: A prospective longitudinal analytical study was conducted in children and adolescents between 6 and 19 years of age in Area III de Salud de Murcia (Lorca). 132 volunteers with MASLD or at risk of suffering it received a nutritional intervention based on a Mediterranean diet with a reduction of ultra-processed foods for 12 months.
Results: A higher distribution of steatosis was obtained in volunteers of Hispanic-American origin (42.9%), low educational level of young people (85.71%) and their fathers (50%), but not of mothers, and in the middle income level (70%). In anthropometric measures, BMI, waist circumference, hip circumference, % fat, % water, and % muscle were associated with increased risk of MASLD (p =0.013; 0.001; 0.001; 0.001; 0.001; 0.003; 0.024 respectively). The distribution of MASLD was highest in participants with overweight (45.2%), followed by those who were obesity (42.9%) and those with normal weight (11.9%). In blood biomarkers, a stronger association was identified between total cholesterol, triglyceride and GPT-ALT levels and MASLD (p =0.019; 0.001 and 0.073 respectively).
Conclusion: It is essential to promote nutritional education from primary care, focusing on parents and school-aged children, to raise awareness of the risks associated with excessive consumption of ultra-processed foods. In addition, it is crucial to promote healthy eating habits and physical activity to curb the alarming increase in MASLD in young people.

PO3.115

What are good outcomes for BMI reduction in children's obesity? Is it the rate of change which is important? A study of BMI trajectory before and after engagement with the paediatric complications of excess weight service in South Yorkshire

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Introduction: In 2021, centres based in the 7 NHS regions in England set up pilot clinics to deal with the complications of excess weight (CEW) in children and young people (CYP). Each service uses a multidisciplinary team (MDT) to address, reverse and prevent the psychosocial complications related to excess weight. The Sheffield service consists of consultants, a psychologist, a dietitian, specialist nurses and family support workers. They aim to not only reduce BMI, but also to improve young people's mental wellbeing, improve body image and cultivate a healthier

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relationship with food which is realistic and sustainable for the future. Outcome measures Nationally include change in BMI z-score from service entry. This does not take into account the rate of change in BMI z-score prior to service entry, and therefore is missing important information in service evaluation.

Methods: This research assessed the comparison of BMI trajectory over a time period prior to care within the CEW clinic, to that achieved during management within the service, to look at overall success using BMI z-score for age and gender.

A pre and post study method was used. Z-scores were taken as close as possible to 2 years before the first appointment, at the first appointment and at the last appointment on discharge. The rate of change of Z-score was then calculated from this data.

From a sample of 75 patients, 30 met inclusion criteria of having sufficient measurements for analysis.

Results: The study showed an overall decrease in Z-score after engaging with the CEW service. Prior to the first clinic, the average Z-score was +3.56. Then at the first appointment, the average Z-score had risen to +3.62. On discharge from the CEW clinic, the average Z-score had decreased to +3.16. Lifestyle changes can be incredibly challenging particularly given the health inequalities experienced by those living in deprivation and those of non-white ethnicity. By not accounting for a prior upward BMI trajectory, the impact of specialist obesity services may not be fully realised.

Conclusion: This study demonstrates the positive impact the CEW service has on reducing BMI z-score. It also demonstrates the importance of regular measurements which are recommended to be introduced into routine practice as standard care. Without this complete picture it is impossible to assess the impact of CEW services on Quality Adjusted Life Years which are required for evidence of cost-effectiveness for future commissioning. Further research on the trajectory of patients BMI z-score change would be helpful to gain a better understanding of what the outlook is for these children's future.

Conflict of Interest: None disclosed.

Funding: No funding to report.

PO3.116

Links between sedentary behavior and body weight among 7-8-year-old Lithuanian children

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Introduction: The Growth Surveillance Study of Lithuanian Children is routinely performed in the country since year 2008. The 6th round of the surveillance was conducted in 2023. This initiative enables systematic collection of data on the measured weight and height status of children aged 7-8 years and on physical activity, sedentary behavior, dietary intake, family background and school environment. In this abstract we aim to present links between sedentary behavior and body weight of first grade Lithuanian children based on the data of the last round of the survey.

Methods: The survey is affiliated with the World Health Organization European Childhood Obesity Surveillance Initiative (COSI). Cross-sectional epidemiological study of a national representative sample of first grade children was performed in 96 schools of Lithuania in 2023. Cluster sampling of classes was used. Object of the study – 7 and 8 years old school children. Anthropometric measurements of 1539 (48.4%) boys and 1642 (51.6%) girls were conducted by trained researchers of Public Health. The same equipment in all schools was used. Parents of first graders, if agreed to participate in the study, completed the Family questionnaires (n = 3355). Physical development of children was evaluated by BMI using the international cut – off points recommended by International Obesity Task Force (2012).

Results: Medians of time were calculated indicating how long children spend while doing their homework and reading books. During weekdays significant differences were observed among boys and girls with normal weight vs. boys and girls with overweight or obesity ($H = -98.33$, $p = 0.001$; $H = -137.17$, $p < 0.001$). Lower time medians (min, max) found for boys with normal weight: 1 (0; 10) vs. 1.33 (0; 6) and girls with normal weight:1 (0; 10) vs. 1.5 (0; 10). During weekends time medians were significantly lower ($H = -72.23$, $p = 0.025$) for girls with normal weight: 1 (0; 5) vs. 1 (0; 10). Significantly bigger medians were observed between girls with overweight or obesity vs. thinness during weekends.

Similar results were obtained for boys and girls comparing median times spent watching TV and playing computer games during weekdays ($H = -98.52$, $p = 0.001$; $H = -128.92$, $p < 0.001$) and weekends ($H = -72.59$, $p = 0.018$; $H = -91.97$, $p = 0.02$). Results of time medians (min, max) between children with normal weight and children with overweight or obesity were as follows: boys 1.5 (0; 10) vs. 1.5 (0; 10) and girls 2 (0; 6) vs. 2 (0; 6) during weekdays and 3 (0; 10) vs. 3 (0.5; 10) for boys during weekends. However, the results indicate higher time medians for girls with normal weight 3 (0; 10) vs. girls with overweight or obesity 3 (0; 8). Also, significantly bigger medians were observed between girls with overweight or obesity vs. thinness during weekdays and weekends.

Conclusions: Longer time of sedentary behavior (doing homework, reading books, watching TV or playing computer games) is significantly associated with elevated body weight of 7-8-year-old Lithuanian children.

PO3.117

Current and proposed care pathways for managing obesity-related complications in patients with Prader-Willi Syndrome (PWS)

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Introduction: Obesity control is the key factor in the management of patients with Prader-Willi syndrome (PWS). However, this can be quite challenging due to several factors. Infants and children with PWS are advised to consume 60-80%of the recommended daily allowance to prevent obesity. This can be difficult to implement whilst also ensuring that they are meeting micronutrient needs during their period of growth and development, which can be mitigated by providing appropriate dietary counselling. To date, pharmacologic treatment of hyperphagia and obesity in PWS has been limited.

The aims of this study were to:

- Look at the current care provided for patients with PWS at our tertiary hospital in relation to their obesity management.
- Assess whether any of these patients meet the referral criteria for being followed up at the CEW(complications of excess weight) clinic.
- Develop a care pathway for patients with PWS to promote the best care and self-management.

We reviewed the electronic notes and letters of patients with PWS who attend the paediatric endocrine clinic at our tertiary hospital.

Conclusion: We have 16 paediatric patients with PWS in our cohort. 81% have complications of excess weight. Interestingly, 31% (n=5) of these patients with excess weight-related complications had a BMI below the 75th percentile.

73% of the patients are overweight or obese (BMI >91st centile), of whom 81.8% had additional medical needs related to obesity, including OSA, scoliosis, diabetes, and NAFLD. All our PWS patients who suffered from obesity-related complications had a BMI SD below 3.3, but one.

Discussion: Patients with PWS die prematurely due to a respiratory cause in most cases at all ages.

Obesity contributes to the increased risk of obstructive sleep apnoea in PWS patients, amongst other factors. In adults, increasing obesity is associated with increased airway resistance, reduced lung compliance and lower lung volumes.

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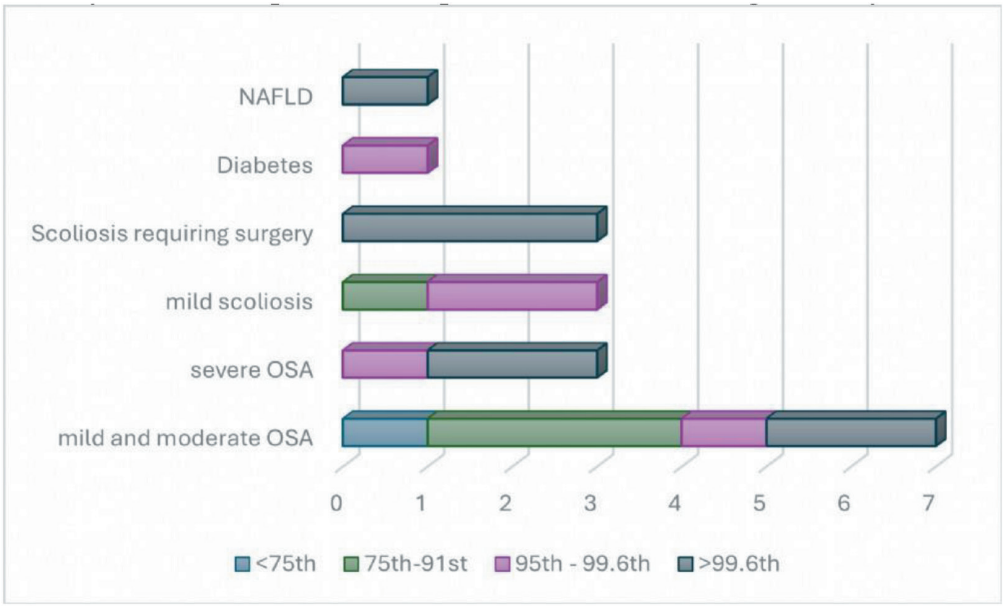


Fig. 1. Obesity-related complications in patients with PWS categorized by BMI centiles.

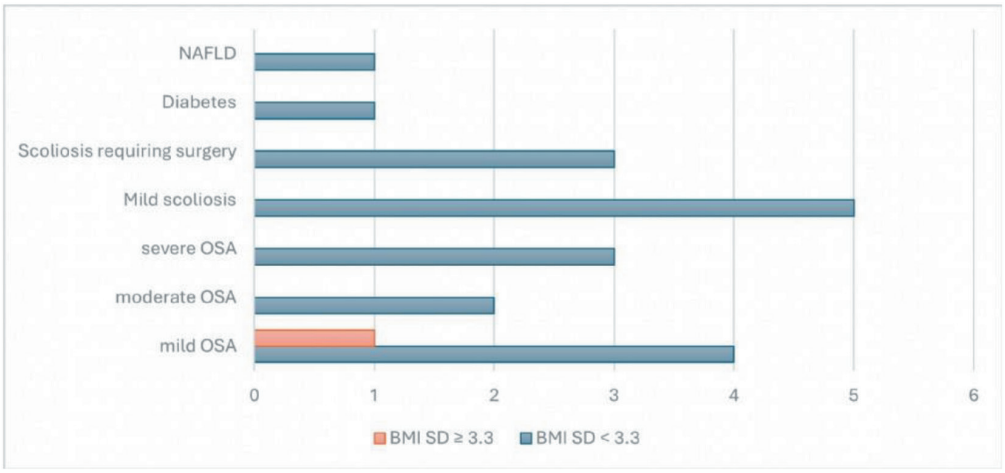


Fig. 2. Obesity-related complications in patients with PWS categorized by BMI SD <3.3 and ≥ 3.3.

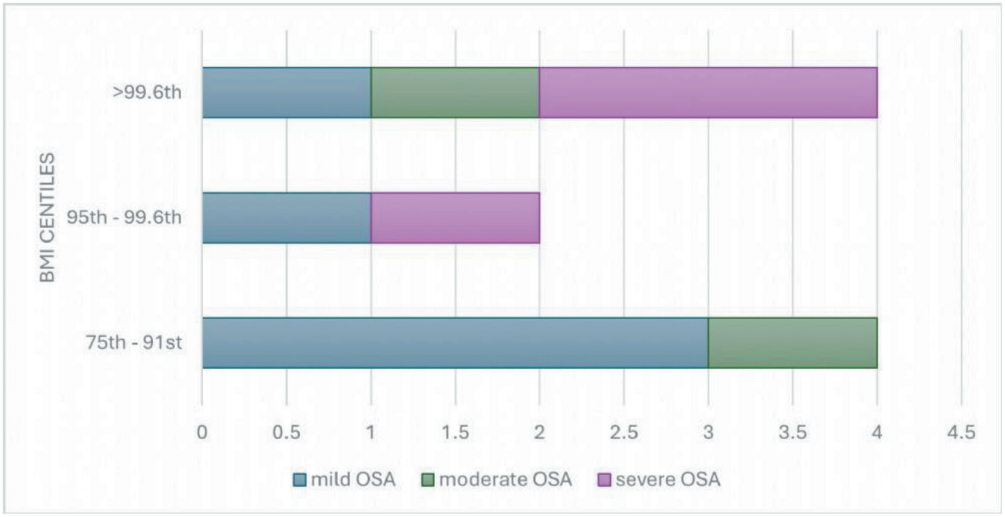


Fig. 3. Obstructive sleep apnea in patients with Prader-Willi Syndrome, categorized by BMI centiles.

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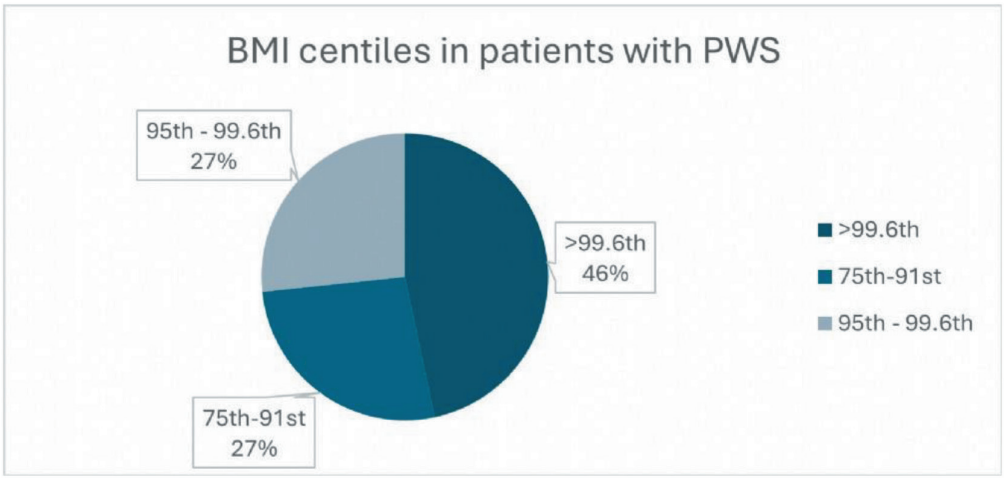


Fig. 4. The distribution of body mass index centiles among patients with PWS within our cohort.

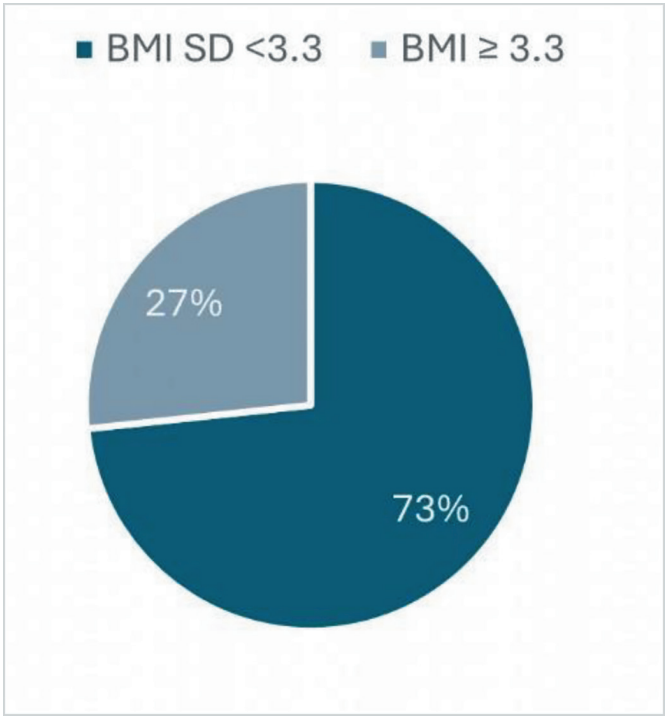


Fig. 5. The distribution of the body mass index standard deviations among patients with PWS in our cohort.

However, the relationship between obesity and pulmonary function in children is far more complex, with some studies indicating decreased functional residual capacity (FRC)in obese children. Longer duration of obesity may be linked to poorer pulmonary function and lower FRC, suggesting a more pronounced impact in adults with PWS.

Our findings revealed that the majority of the PWS patients who suffered from obesity-related complications had a BMI SD below 3.3, which may suggest a heightened vulnerability to obesity complications in patients with PWS, even in those with a lesser degree of obesity. This could potentially be related to the duration of obesity rather than the degree of obesity, reinforcing the importance of addressing obesity at a younger age.

It is essential to consider whether establishing independent clinics specializing in PWS that offer holistic care for these patients is the best approach. Alternatively, some of the PWS patients qualify for referrals to CEW clinics. However, it is crucial to consider whether a lower threshold for referring children and young people with PWS to CEW clinics should be implemented to address their obesity at an earlier stage and potentially prevent obesity-related complications.

PO3.118

Characterization of the circulating proteomic profile in children with obesity and its modulation following a behavioral intervention

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Introduction: Obesity is a complex metabolic disorder driven by interactions among the genome, transcriptome, microbiome, metabolome, and proteome, leading to adipose tissue dysfunction in energy and endocrine regulation. This study aimed to evaluate the circulating levels of 30 key proteins involved in lipid metabolism, appetite regulation, and inflammation in children with obesity compared to those with normal weight, and to assess changes in the concentrations of these proteins in the circulating proteomic profile of children with obesity following a lifestyle intervention.

Methods: Sixty-eight pediatric patients, both with and without obesity, were prospectively recruited from a single referral center. Clinical and anthropometric data were collected for all participants. Blood samples were obtained for proteomic analysis. Twelve patients with obesity underwent a 6-month protocolized lifestyle intervention. Blood samples were collected before and after the behavioral intervention for proteomic analysis.

Results: Among the 30 circulating proteins analyzed, 11 exhibited significant differences between children with obesity and those of normal weight. These proteins were linked to cortisol, glucose, and lipid metabolism, as

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well as inflammation and appetite regulation. Levels of HSD11B1, GHRL, and PYY appeared to reflect counter-regulatory mechanisms, while GDF2, FGF21, OLR1, TGF-β1, and IL18 were indicative of lipotoxicity processes. Of the 30 circulating proteins analyzed, 8 showed significant changes following the behavioral intervention. HSD11B1, GDF2, and TGF-β1 were nearly fully normalized, while CCL2, TNF-α, IL15, LAMP3, and VEGFA exhibited a slight increase, likely reflecting the acute inflammatory stimulus required for white adipose tissue remodeling.

Conclusions: The circulating proteomic profile of children with obesity showed significant differences compared to children with normal weight, confirming disruptions in metabolic, inflammatory, and appetite-regulation pathways in early obesity. These changes were observed in children with obesity whose analytical parameters were within the normal range, highlighting the utility of these proteins for the clinical diagnosis of obesity and its complications. Of the 11 proteins significantly altered in children with obesity, 3 were fully or partially normalized after the behavioral intervention, relating to metabolism and inflammation. Lifestyle changes, as the sole therapeutic tool, had a modest impact on anthropometric profiles and obesity-associated alterations.

PO3.119

Glucagon-like peptide-1 receptor agonists likely explain that more children achieved a treatment effect of BMI -0.25 units in the first 24 months of third-level obesity treatment

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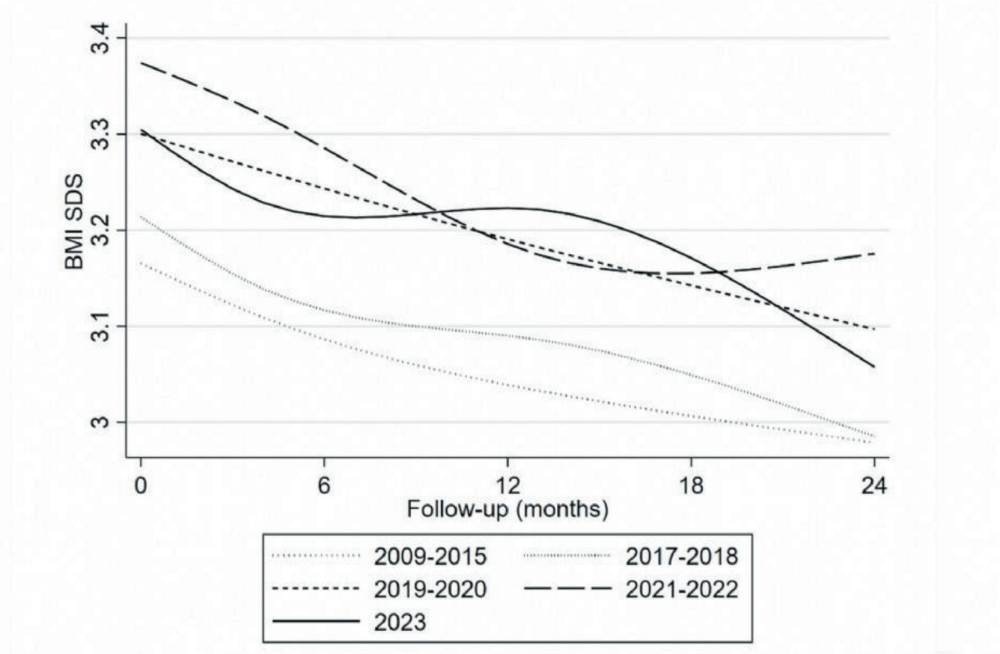
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Introduction: Intensive health behaviour and lifestyle treatment (IHBLT) is recommended for childhood obesity. Clinical childhood obesity treatment often describes a treatment ladder, where children with unsatisfactory treatment results or complications are referred to higher levels of care. In addition, clinical standard treatments are continuously modified for many different reasons. Evaluations of routine treatments are therefore marred with difficulties, such as changes in case mix, staffing, and treatment modalities. Randomised controlled studies on complex IHBLT interventions are notoriously hard to perform. Instead, patient quality registries can provide valuable real-time and continuous information and help determine what works.

Methods: The CORE study is an ongoing cohort study at the National Childhood Obesity Centre, Stockholm, Sweden, 2009–2015 (retrospective) and 2017–2023 (prospective). The intervention was the inclusion at the centre. Inclusion criteria were age 0–16 years with severe obesity, usually defined as grade 2 obesity according to the International Obesity Task Force with complications, or obesity grade 3, and unsuccessful previous treatment for at least 6 months at second-level centres. The children were offered highly individualised treatment modalities covering different aspects of IHBLT. The treatment intensity varied between patients within the clinic's structured framework. From 2023, glucagon-like peptide-1 receptor agonists (GLP-1) were offered to selected patients, currently around 20% of all included patients (point prevalence). Data were entered in the Swedish Childhood Obesity Treatment Register (BORIS). A linear mixed model was used for the first outcome (BMI SDS change) and a logistic mixed model for the second outcome (proportion obtaining -0.25 SDS units). No individuals were excluded from the analysis. Missing data were handled in the mixed model and no imputations were made.

Results: Here, we present data from 1126 children (51.6% boys) included in regular third-level obesity treatment. We categorised the children by year of inclusion. The frequency of complications and age at inclusion varied between cohorts (data not shown). The mean body mass index standard deviation score (BMI-SDS) varied slightly between the cohorts (Figure 1). Still, the average BMI-SDS change was similar, -0.19 to -0.23, median 0.20, for earlier cohorts, and the cohort starting 2023 lowered BMI by on average 0.25 SDS. A larger fraction of patients who started in 2023 achieved a reduction of BMI by 0.25 SDS (Figure 2).

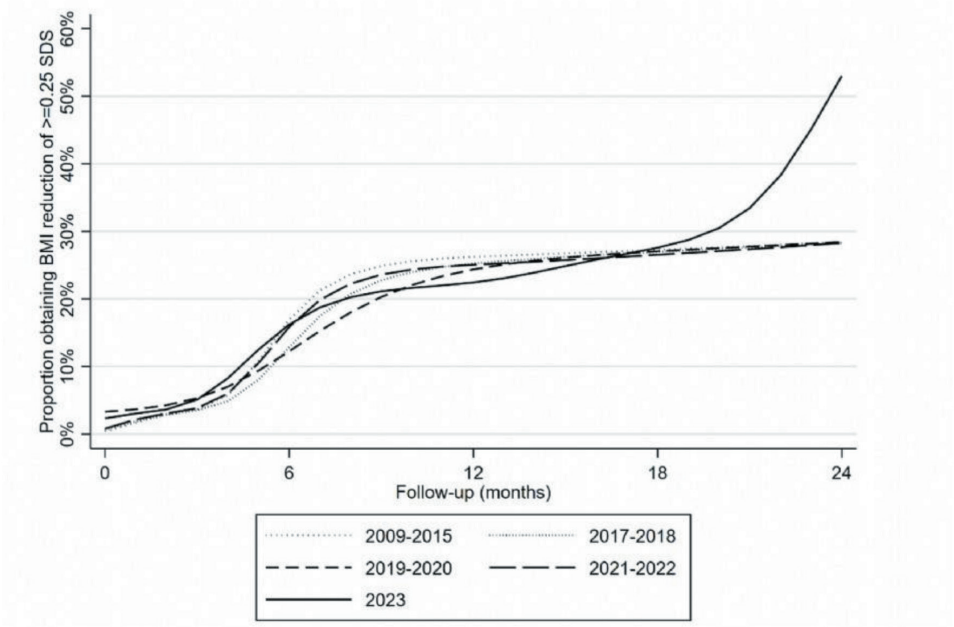
Conclusion: A patient quality register can be used to follow results of clinical routine treatment despite variations in case mix and treatment modalities. The results of treatment at a third-level centre were similar from 2009 to 2022, but a larger fraction of patients in the 2023 cohort had a clinically relevant change in BMI. We conclude that this is due to the increasing use of GLP-1 in addition to IHBLT. There is a need to integrate anti-obesity drugs in clinical practice.



BMI SDS change during follow-up, categorised by year of treatment start

Fig. 1.

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Proportion of individuals obtaining BMI SDS reduction of at least 0.25 units during follow-up, categorised by year of treatment start

Fig. 2.

PO3.120

Associations Between Dietary Patterns and Body Composition in Spanish Children with Obesity: A Cross-Sectional Analysis of the IBEROMICS Pediatric Cohort

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Introduction: Diet is a key determinant of cardiometabolic health, which may be partly explained by differences in body composition status. However, few studies examine dietary patterns (DP) and body composition in Spanish children. The aim of this study was to evaluate the associations between different *a priori* and *a posteriori* DP approaches such as the Mediterranean Diet (MD) index, the Planetary Health Diet (PHD) index and a DP derived by Reduced-Rank Regression (RRR), with body composition measures in the IBEROMICS pediatric cohort.
Methods: A sample of Spanish children with overweight/obesity (n = 672) with available dietary data, bioimpedance and anthropometrical body composition data and lifestyle covariates were analyzed. Nutritional data from two 24h-recalls covering both weekdays and weekend days was used to calculate a PHD index and to derive RRR DPs based on food groups explaining the maximum variability in a set of nutrient response variables – saturated fat, total sugars and fiber density. A row-sparse RRR model was employed to address the high dimensionality of the dietary data, thereby reducing multicollinearity and improving interpretability. A MD adherence questionnaire was used to calculate a MD adherence index. Associations between DP adherence and body composition measures were tested with multivariable models adjusted for covariates (age, sex, Tanner stage, origin, physical activity and sociodemographic status)
Results: Children presented moderate-to-low MD adherence (mean score: 6/11 points) and low adherence to the PHD (mean score: 41/141 points). MD adherence did not show significant associations with body composition, whilst a higher adherence to the PHD was associated with a higher amount of total lean mass: low adherence 39.6 kg vs medium adherence (+2.0kg, p=0.002) and high adherence (+1.5kg, p=0.026). The main RRR DP was characterized by high intakes of breakfast cereals, blue fish and sauces and low intake of olive oil, butter and desserts. Adherence to this DP showed a negative association with body mass index z-score [β=-0.128; p=0.022], the waist circumference z-score [β=-0.167; p=0.003] and the sum of 4 skinfolds z-score [β=-0.182; p=0.004].
Conclusion: The overall adherence to the MD and the PHD in Spanish children with obesity is moderate to low. Whilst MD did not show associations with body composition, PHD adherence was associated cross-sectionally with lean mass. On the other hand, the RRR DP was also associated cross-sectionally with body composition. These findings suggest that traditional *a priori* DPs may be insufficient to capture the complexity of dietary behaviors in populations with obesity. Novel methods like row-sparse RRR can identify combinations of foods that explain variations in body composition. This approach may provide valuable insights into cardiometabolic risk factors in children.

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PO3.121

Clinical results of GLP-1 Analogues in Combination with Lifestyle Interventions on Weight, BMI and Body Composition Children and Adolescents with obesity

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Introduction: Childhood obesity require effective, evidence-based interventions. This study investigates the "real-world" outcomes of GLP-1 analogues combined with structured lifestyle interventions in treating pediatric obesity.

The primary aim of the study was to assess changes in weight, Body Mass Index (BMI) and body composition in children and adolescents undergoing GLP-1 analogues treatment combined with lifestyle modification at a pediatric obesity clinic in Sweden. Secondary aim included medication adherence.

Methods: 21 children and adolescents received treatment with GLP-1 analogues in combination with structured lifestyle intervention at the National Childhood Obesity Centre between 2023 and present. The structured lifestyle intervention included tailored dietary counselling, physical activity guidance, and behavioural support. Clinical assessments, including weight, BMI, and body composition (via bioimpedance analysis), were conducted at baseline and at follow-ups 3 and 6 months.

Results: In total 19 children had measurements at both baseline and 6 months (female 68%, mean age 14.2 years, BMI: 40.3 kg/m2). From baseline to 6 months BMI±sd, +0.3±8.5 (p=0.888), total body fat % decreased -2.7%±2.9 (p<0.001), fat free mass (kg) increased +1.24.0 (p=0.216).

Conclusion: In this preliminary analysis of a clinical cohort, we find that the combination of treatments, GLP-1 analogues and structured lifestyle intervention resulted in a reduction of body fat% with maintained BMI and preserved fat free mass. Further analysis with a larger number of subjects are planned.

PO3.122

Physical activity patterns in children and adolescents with and without obesity: Associations with BMI z-score and blood markers of glucose and lipid metabolism

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Background: Previous studies has shown associations between physical activity (PA) and body mass along with measures related to overall health[1]. However, most studies have been performed in combined analyses across populations with and without obesity. Therefore, stratified analyses between the populations are warranted.

Methods: This study is based on data obtained from The HOLBAEK Study during the period 2006 to 2012. The study population consist of youths (7-18yrs) with obesity recruited from The Children's Obesity Clinic, Holbaek Hospital (n=1,127) and youths recruited from schools in Zealand, Denmark (n=329). Data on PA is based on questionnaires regarding time spent on organised sports and unorganised PA (walks and running during free time and school commuting). To quantify weekly PA levels, each activity was assigned with a metabolic equivalent of task (MET) score, previously defined in children and adolescents[2]. Hours spent on each activity was multiplied with the MET score, with each score being added into a single score defined as MET hours per week (MET-h/w). To investigate combined and stratified associations, the study population was divided into a group with obesity (OB), with a body mass index (BMI) z-score ≥1 (n = 1212) and a group with normal weight (NW) (BMI z-score <1, n = 244). Linear regression analyses adjusted for BMI SDS and multiple testing were performed to analyse associations between PA level and investigated phenotypes. Differences between the groups were investigated using the Welch's unpaired t-test adjusted for multiple testing.

Results: Group characteristics are presented as median (interquartile range). The BMI z-score of the OB and NW groups were 2.9 (2.4, 3.3) and 0.1 (-0.5, 0.5) (p<0.01), respectively. The OB group were older (11.0 (9.0, 14.0) vs 11.0 (9.0, 13.0) yrs, p<0.01) and had a lower weekly PA level (14.3 (5.4, 25.0) vs 28.4 (13.3, 46.6) MET-h/w, p<0.01) than the NW group. The OB group had lower HDL (1.2 (1.0, 1.4) vs 1.6 (1.4, 1.9) mmol/l, p<0.01), higher LDL (2.5 (2.0, 2.9) vs 2.0 (1.8, 2.3) mmol/l, p<0.01), and comparable concentrations of HbA1c (34 (33.0, 37.0) vs 35.0 (34.0, 37.0) mmol/mol, p=0.51) than the NW group. Combining the OB and NW groups, MET-h/w was associated with BMI z-score, LDL, HbA1C, and not HDL. In the OB group, MET-h/w was negatively associated with z-score(R^2=0.023, p<0.01) and LDL (R^2=0.027, p=0.02), positively associated with HbA1c (R^2=0.027, p<0.01), and not with HDL (R^2=0.023, p=0.29). For the NW group, MET-h/w was not significantly associated with any of the phenotypes.

Conclusion: PA is a strong marker of health status in childhood obesity, but not in peers with normal weight. These findings call for further investigations of the implications of PA on health when stratified into groups based on body mass.

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PO3.123

Weight Management for Children and Young People living with severe obesity: holistic bespoke MDT approach and lessons learnt

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Background: Children and Young People living with obesity are at high risk of continuing with this trajectory into young adulthood and beyond. Many of them develop complications related to their weight that were previously seen only in adulthood and need these managing in a timely fashion to prevent further progression.

While lifestyle management with focus on behavioural change remains the corner stone especially for primary school children, access to medication, specialist diets and surgical options are increasingly more available for adolescents though there is geographical variation in access to funding. These are still new challenges for paediatric teams and understandable concerns remain from families, the young people themselves, commissioners and clinicians about the long-term impact of these, including considerations about adverse mental and physical effects in children and young people that are still growing. Particular area of focus is that of Low-energy diets (LEDs) that have been shown to be effective for weight loss in adults with obesity and T2DM to understand the feasibility of a similar approach in under 18's.

The Complications of Excessive Weight (CEW) service is a tier 3 complex obesity pilot service funded by NHS England for under-18s living with severe obesity and related complications with the aim to identify the most

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effective models to support young people and their families. All 30 clinics use an MDT approach though referral pathways and criteria for access into the service, links with other tertiary specialities, composition of the MDT all differ depending on existing local provision in the area, recruitment and financial challenges.
Nottingham University Hospitals commenced services in November 2021.A T2 service runs alongside this with some co-working across teams and shared medical expertise.
Methods: To facilitate expansion and improve efficiency and efficacy, staffing models and funding allocation was adapted, novel approaches to patient engagement and offer of specialist diets and medication considered in eligible patients. Opportunity to participate in research was facilitated.
Results: Fixed-term posts were arranged to trial different MDT models e.g. youth worker. Unused funding was proactively identified and used to employ a clinical fellow. Available clinic rooms were used to run adhoc clinics and fill cancellations at short notice. Home visit numbers increased by upskilling existing staff. Community venues were used to run cooking sessions and offer family focused therapy- non-violent resistance (NVR) training. Families were contacted ahead of clinic to offer the travel compensation scheme (if eligible) to reduce the financial implications of attendance. Pre-clinic contact helped to identify any family issues, such as physical access, neurodiversity or language barriers prior to the first appointment so that appropriate adaptations could be made. Mixed virtual and in-person options continue to be offered to improve patient engagement.
Conclusions: The service has met increased target numbers by adapting continuously, however demand far outstrips capacity as was expected and needs urgent attention.

PO3.124

Protocol of the PREFIT-UP Project: Longitudinal Study on Physical Fitness, Cardiovascular Health, and Emotional Well-being in Adolescent

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Introduction: Physical Fitness (PF) is a key health indicator during childhood and adolescence, closely associated with a favorable cardiovascular profile in adulthood. However, whether PF is a powerful marker of health from preschool ages to adolescence is still unknown. The PREFIT-UP project aims to longitudinally evaluate how PF in early childhood (ages 3–5) relates to cardiovascular health and emotional well-being during adolescence (ages 11–17).
Methodology: The PREFIT-UP project is based on a baseline evaluation (the PREFIT project) of 3,179 preschool children. The follow-up duration ranged from 7 to 10 years (2014–15 to 2022–24). At the baseline assessment (preschool age), PF was measured using the PREFIT battery, which included body composition (i.e., body mass, height, waist circumference), cardiorespiratory fitness (PREFIT 20m shuttle run test), muscular strength (handgrip strength and standing long jump tests), and speed-agility (PREFIT 4x10m shuttle run test). During the follow-up (adolescence period), PF was assessed using the ALPHA Fitness battery, which incorporates the same tests as PREFIT but adapted for adolescents. In order to measure cardiovascular health, arterial stiffness (Mobil-O-Graph), continuous glucose monitoring (FreeStyle Libre Pro iQ, 24h / 7 days), and adiposity metrics (intermuscular fat and fat mass via ultrasound and TANITA bioimpedance, respectively) were used. Additional evaluations included, among other, test related to physical activity (International Physical Activity Questionnaire), sedentary behavior (Youth Leisure-Time Sedentary Behavior Questionnaire), sleep quality (Pittsburgh Sleep Quality Index and Pediatric Daytime Sleepiness Scale), dietary habits (KIDMED), eating behaviors (Three Factor Eating Questionnaire), quality of life (KIDSCREEN-27), and mental health (Child Behavior Checklist and Perceived Stress Scale).
Results: The results are expected to reveal significant associations ($p<0.05$) between early childhood (ages 3–5) PF and various indicators of physical and mental health later in adolescence (ages 11–17), highlighting the protective role of good PF in early life for preventing health risks later. This study is groundbreaking in assessing the relationship between preschool PF and cardiometabolic and emotional health during adolescence.
Conclusions: PREFIT-UP aims to explore the potential role of early childhood physical fitness (PF) as a predictor of physical and mental health across development, supporting school-based physical activity promotion programs to enhance quality of life and reduce the risk of diseases in adolescence and adulthood.

Conflict of Interest: The authors declare that they have no competing interests in relation to this abstract.

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PO3.125

Early-life adipose tissue alterations and their association with impaired metabolic health after *in-utero* adipogenic programming – a PEACHES cohort interim analysis

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Introduction: Maternal obesity and other early-life factors critically affect the long-term risk of developing overweight and obesity in the offspring. However, underlying mechanisms of early adipose tissue formation and its role in the development of obesity and related metabolic comorbidities remain insufficiently understood. The aim was to investigate the impact of pre- and perinatal risk factors including maternal pre-conception obesity on the development of subcutaneous adipose tissue (SAT) and its impact on early cardiometabolic alterations in the offspring.

Methods: As an interim analysis of the Programming of Enhanced Adiposity Risk in Childhood-Early Screening (PEACHES) cohort (n = 1707), children of mothers with and without pre-conception obesity were phenotypically characterized at ages 5 (n = 1105) and 8 years (n = 654). Based on stringently longitudinal data recorded since pregnancy, median regression models were used to analyze the relationship between different perinatal adipogenic risk factors and the children's SAT layers as measured by ultrasound. Using multiple logistic regression models, odds ratios (OR) and 95% confidence intervals (95% CI) were calculated to study the effects of increased SAT at 5 years on metabolic health, as defined by components of the metabolic syndrome, at 8 years.

Results: Offspring of mothers with pre-conception obesity (body mass index (BMI) mean ± standard deviation (SD) 36.8 ± 5.2 kg/m²) were compared to those of mothers without obesity (BMI 23.8 ± 3.2 kg/m²). At age 5 years, they had in average higher BMI z-scores (0.52 ± 1.20 SD vs. -0.09 ± 0.97 SD, $p < 0.001$), higher total body fat mass percentage (4.38 ± 1.63% vs. 3.71 ± 1.03%, $p < 0.001$) and more SAT (59.9 ± 51.5 mm² vs. 50.6 ± 45.4 mm², $p = 0.001$).

Among offspring exposed to maternal obesity in pregnancy, additional perinatal adipogenic risk factors were associated with proportionately more SAT at age 5 years than those offspring not exposed to obesity in pregnancy who had no additional risks. These risks for % median changes in SAT included increases in birth weight (defined as per kilogram) (47.7% more SAT, 95% CI 16.0-87.9%), rapid weight gain (defined as ≥ +0.67 SD from birth to 2 years) (62.8% more SAT, 95% CI 23.0-115.4%), and female sex (44.9% more SAT, 95% CI 12.9-86.0%).

Following adjustment for child's age, sex, and maternal pre-conception obesity, each rise in 10 mm² SAT at age 5 years was independently linked with higher risks for cardiometabolic changes at age 8 years, including increases in waist circumference (≥ P90) (OR 1.41, 95% CI 1.32-1.51), systolic and/or diastolic blood pressure (≥ P90) (OR 1.12, 95% CI 1.05-1.20), triglyceride concentrations (≥ P90) and/or lowered HDL cholesterol concentrations (≤ P10) (OR 1.11, 95% CI 1.07-1.16).

Conclusion: Our results show that when offspring were exposed to maternal obesity in pregnancy, additional adipogenic risk factors at birth and thereafter influenced SAT development which was linked to impaired metabolic health at primary school age, supporting the need for targeted preventive interventions within the first 1000 days of life.

PO3.126

Transition of care for adolescents and young adults with obesity: a systematic review with indirect evidence to inform a clinical practice guideline

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Introduction: The period of puberty and early adulthood represents a crucial phase for chronic disease management, including obesity. The last systematic review on transition of care (ToC) interventions for adolescents and young adults living with obesity (AYALwO) dates back to 2013 [1]. Our aim was to evaluate the current evidence by a systematic review to inform a clinical practice guideline on ToC interventions for AYALwO.

Methods: All methods were defined a-priori [2]. In 01/2024, we searched Medline, Embase, Cochrane Central Register of Controlled Trials and ClinicalTrials.gov from 2013 onwards and screened reference lists of included studies. We included randomized-controlled trials (RCTs) and non-randomized studies of interventions (NRSI) with a control group enrolling AYALwO, diabetes mellitus type (DMT) 1 or 2 as well as RCTs only for inflammatory bowel disease (IBD), arthritis, or asthma. These populations were considered transferable in case of lacking direct evidence (i.e., obesity). Outcomes of interest of ToC interventions were (disease-specific) physical health status (e.g., HbA1c), quality of life (QoL), self-efficacy, self-management, transfer rate, and transition readiness. Two reviewers independently screened references, extracted data, assessed risk of bias (Cochrane RoB 2.0/ ROBINS tools) and the certainty of evidence (CoE; GRADE methodology). Results were summarized via random-effects meta-analysis for HbA1c and for all other outcomes descriptively.

Results: Of 5,405 screened records, we finally included 13 RCTs (n=9 DMT1, n=2 mixed population, n=1 IBD, n=1 arthritis) and 4 NRSI (n=2 DM, n=2 mixed population). Most (patient-reported) outcomes were assessed and reported infrequently and very heterogeneously. Overall, no effect was shown on HbA1c (mean difference 0.12% [95%-confidence interval -0.77; 1.01]) in 7 RCTs or 2 NRSI. While for QoL, self-efficacy, and self-management results were inconclusive, or showed no meaningful effects in most trials evaluating these outcomes, a higher transfer rate by appointment reminders (1 RCT), consultation at the same physician for paediatric and adult care (1 RCT) as well as an improvement of transition readiness for transition-oriented patient education programs (1 RCT, 1

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NSRI) was found. CoE was very low for all outcomes and intervention types, mainly due to a high RoB, indirectness and imprecision.
Conclusion: No controlled trials were identified for AYALwO. For the other diseases, the evidence base on relevant outcomes was very limited. Only transfer rate or transition readiness were improved by certain interventions. The presence of exclusively indirect and very low CoE, highlights the need for future research regarding ToC interventions in AYALwO.

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PO3.127

Inflammation in Adipose Tissue of Male Children Associated with Obesity

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Introduction: In obesity, low-grade inflammation of adipose tissue (AT) is confirmed and linked to metabolic disease and organ complications. Dysfunctional adipocytes secrete inflammatory adipokines and infiltration with immune cells occurs. Childhood and adolescent obesity are generally considered one of the most significant public health issues of the 21st century because obesity during childhood often persists into adulthood, increasing the risk of developing various metabolic disorders that lead to metabolic imbalances. This study aims to explore the relationship between adipocyte morphology and possible markers of tissue inflammation in AT of otherwise healthy male children, potentially indicating early metabolic imbalances linked to obesity.
Methods: 70 healthy male children undergoing elective hernia repair were divided into two groups based on their body mass index Z-score. During surgery at the Department for Pediatric Surgery of the University Hospital Osijek, samples of subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) were collected. Morphometric analysis of AT was conducted on the collected samples of SAT and VAT using basic hematoxylin and eosin histological staining. Additionally, immunohistochemistry was also performed on BenchMark ULTRA fully automated workflow system to quantify the number of $CD163^+$ cells and identify crown-like structures (CLS) per mm^2 of AT.
Results: We investigated 37 normal weight children (20,7±10,0 kg) and 33 children with obesity (32,2±20,1 kg). The children in the control group were 5,1±3,2 years old, and in the group with children with obesity 6,2±3,8 years, without significant difference in age between groups. Male children with obesity had a higher mean adipocyte surface (p=0,012), a higher number of $CD163^+$ cells (p<0,001) (Figure 1), and more CLS (p=0,006) in VAT (Figure 2). There was positive correlation between adipocytes surface area and number of $CD163^+$ cells in VAT (r=0,307, p=0,010) (Figure 3).
Conclusion: Changes in visceral adipose tissue associated with obesity occur in early age. Consequently, this may trigger a shift in macrophage polarization, influence their accumulation, affect the structural stability of the extracellular matrix, and contribute to the development of an inflammatory process.

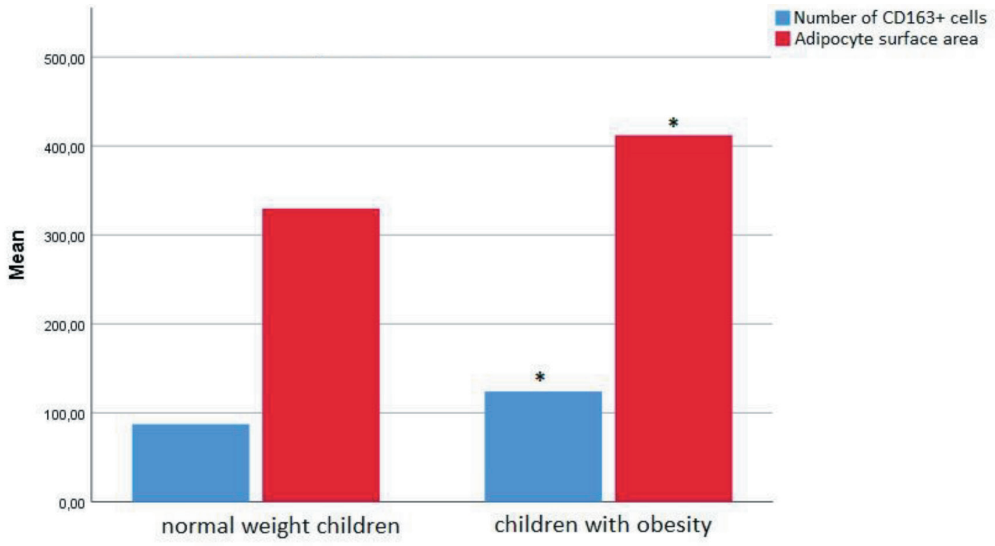


Fig. 1. Number of CD163 positive cells and adipocyte surface area in visceral adipose tissue.

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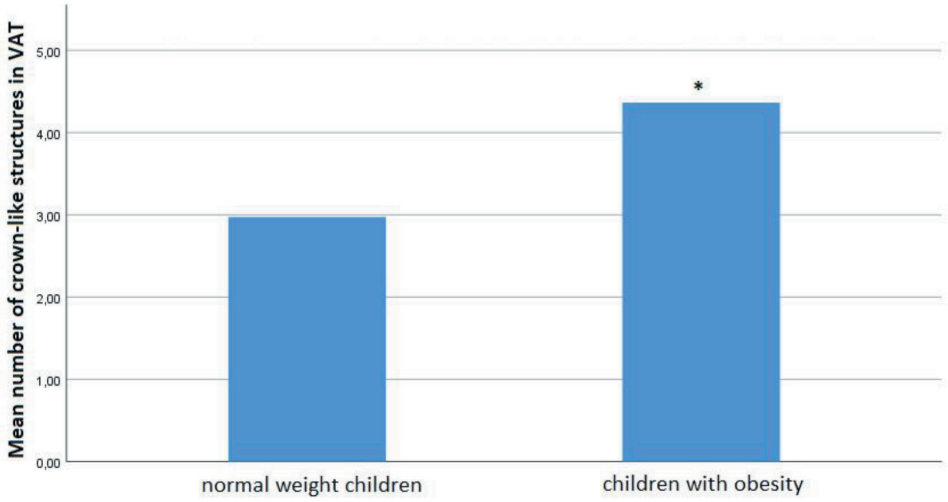


Fig. 2. Number of crown-like structures in visceral adipose tissue depending on group.

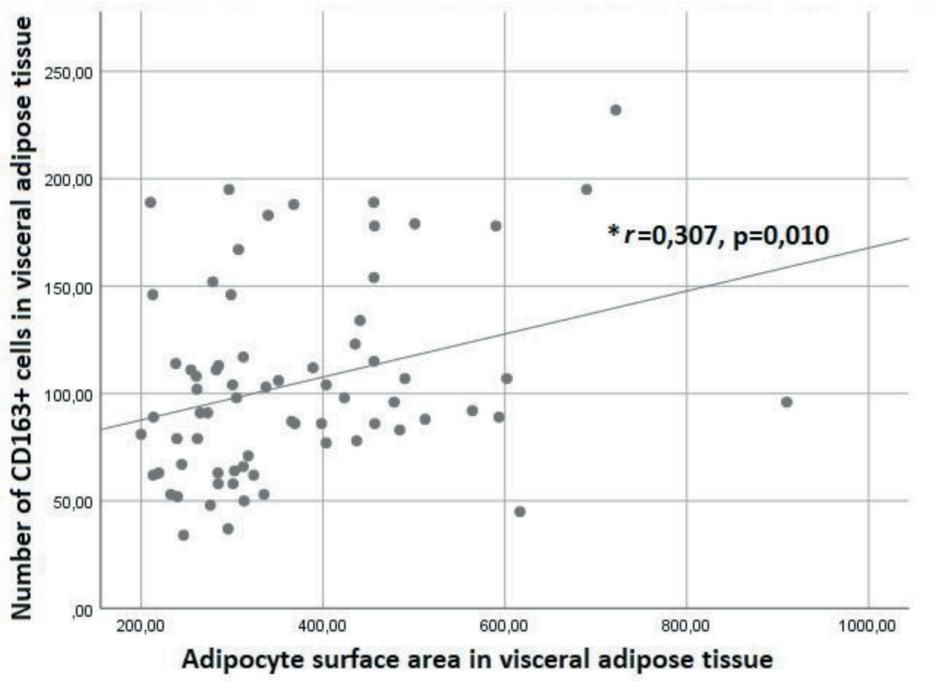


Fig. 3. Pearson correlation between number of CD163 positive cells and adipocyte surface area.

PO3.128

Investigating the association between dietary habits and attitudes of mothers and their children's childhood body mass index percentiles

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Introduction: The obesity epidemic is one of the major public health problems affecting both children and adolescents. While genetic factors can accelerate the development of obesity, the dietary habits and lifestyle of the family and the child influence childhood obesity. Studies have focused on the eating habits and attitudes of mothers, who play an active role in this issue.The aim of this study was to assess mothers' dietary habits and attitudes and to investigate their relationship with body mass index (BMI) in themselves and their children.

Methods: This is a cross-sectional study. The validated version of 'Three-Factor Eating Questionnaire'(TFEQ) assessing dietary habits and attitudes was administered to the volunteering mothers presenting with their children to the family medicine and pediatric outpatient clinics of a Training and Research Hospital. TFEQ measures the degree to which people restrict their eating to control their weight, levels of uncontrolled eating and the degree to which they eat when they are emotional. The researchers collected information about the mothers' socio-demographic characteristics and the childrens' gender, age and grade if the children were in school.The scores of all factors were calculated.Body mass index

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(BMI) was calculated by asking the height and weight of the mothers and their children, and obesity categories and percentile values of the children were determined. Informed consent was ontained from the participants. The data were analysed using descriptive statistics.
Results: A total of 60 mothers and 60 children were included to the pilot study. The median age was 36 and 78% were housewifes. The highest score was in factor 3 followed by factor 1 and factor 2. Mothers who had BMI values ≥30 were 47% and in this group uncontrolled eating-factor 1 and emotional eating-factor 2 mean scores were higher and cognitive restriction of their eating to control their weight -factor 3 scores were lower than those who were overweight or had normal BMI. The frequency of children in the normal BMI percentiles were less in the group of mothers who had BMI ≥30.
Conclusion: Participants with obesity in the study were more likely to eat emotionally and less likely to control and restrict their eating. The eating habits and attitudes of mothers may influence the eating habits of their children and thus the development of obesity in children.

PO3.129

Family wealth inequalities in Portuguese children's health-related quality of life according to weight status - findings from COSI/WHO Europe study

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Introduction: Health-Related Quality of Life (HRQoL) is a multidimensional concept encompassing aspects of quality of life that directly or indirectly relate to health, such as physical, psychological, and social well-being.
The interplay between socioeconomic factors, like family earnings and weight status impacts children's HRQoL, highlighting the importance of addressing these factors to promote health equity from an early age.
Methods: This observational cross-sectional study analyzed data from the 6th WHO European Childhood Obesity Surveillance Initiative, the COVID study in Portugal, targeting primary school-age children. BMI was calculated using WHO reference growth charts for children, and data on children's HRQoL and family perceived wealth was obtained through a family form, reporting data during the COVID-19 pandemic (March 2020-June 2022). HRQoL was assessed using the KIDSCREEN-10 parent report, with Rasch scores calculated and transformed into T-scores. Higher values indicate higher levels of HRQoL.
Family perceived wealth reflects how easily a family meets monthly expenses using their earnings. It is categorized as "low" (combining the answers "we have trouble meeting the end of the month with our earnings" and "we barely meet the end of the month with our earnings"), "medium" ("we meet the end of the month with their own earnings without serious problems"), and "high" ("we easily met the end of the month with their own earnings").
Results: Among the 3279 children analysed, 12.0% were classified as having obesity, with a higher proportion of boys (51.8%) than girls (48.2%).
After adjusting for sex and age, the linear regression coefficients showed that family perceived wealth was positively associated with HRQoL in both groups (without obesity: medium compared with low 2.548, 95% CI: 1.398;3.699, p<0.001 and high compared with low perceived health 4.240, 95% CI: 2.953;5.527, p<0.001; with obesity: medium compared with low 3.671, 95% CI: 0.810;6.532, p=0.012 and high compared with low perceived health 3.850, 95% CI: 0.516;7.184, p=0.024).
General linear regression also showed that family perceived wealth demonstrates a clear gradient effect in both groups. The differences in age and sex-adjusted mean scores between the lowest and the medium and higher perceived wealth levels were statistically significant for HRQoL scores (47.64 for high, p<0.001, 45.93 for medium, p=0.003, and 43.38, p<0.001, for low in children without obesity; 48.04, 47.85, and 44.19 respectively in children with obesity, with p=0.038 for the lowest category).
Conclusion: Findings suggest that family perceived family wealth significantly influences children's HRQoL, regardless of BMI. The relationships between this factor and HRQoL emphasize the need for multifaceted interventions that address both family socioeconomic circumstances and weight status to improve children's health and well-being.

PO3.130

Social determinants of adiposity in school-aged children and adolescents: preliminary results of the MUGI project

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Introduction: Childhood obesity is a global health problem, with recent data showing a significant increase.1 Additionally, the rising health inequities in developed countries underscore the need to examine socio-structural factors and vulnerability indicators associated with obesity. Although there is a well-established association in the literature between family socio-economic status and childhood obesity,2 a gap remains regarding the role of other types of social vulnerabilities such as migrant background or maternal education level.
Methodology: This is a secondary cross-sectional study of the MUGI project (Ref. 2019 904 116).3 The main objective of this project was to longitudinally assess health markers and lifestyles in a representative and randomised sample of schoolers from Navarra (Spain). A total of 290 children aged 8 to 16 (mean age= 12.1±2.4; 47.9% girls) were included in the study. Measurements of body weight (SECA 899), height (SECA 217), fat mass (TANITA, SC-240MA), and waist circumference (SECA 201) were conducted in duplicate following standard protocols. BMI z-score was also calculated according to the WHO criteria.4 Additionally, participants' mothers were asked to report their country of birth and educational level. Thereafter these variables were categorised as migrant or native, and university or non-university education level, respectively. Analyses of covariance were conducted to analyse differences in adiposity according to migrant background or maternal education level categories, adjusting by sex and age.
Results: Children with migrant mothers had higher values of waist circumference (65.0±0.8 vs. 62.8±0.4, p=0.017) and body fat percentage (22.0±0.9 vs. 19.6±0.4, p=0.024) than their peers with native mothers, while no differences were found in BMI z-score (1.11±0.15 vs. 0.84±0.07, p=0.108). Regarding maternal education level, no significant difference was found for any of the adiposity variables examined between children whose mothers had received a university education and those whose mothers had not (all p>0.05).
Conclusion: Our results suggest that maternal migrant status may have a negative role on adiposity in children and adolescents. Conversely, no

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significant differences (p>0.05) were found in adiposity based on maternal education level. Our findings highlight the necessity of developing specific health public policy strategies for obesity prevention and management, with a particular focus on disadvantaged environments with a high proportion of migrant families with children.

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Conflict of Interest: No potential conflicts of interest to declare.

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PO3.131

Body Composition Plays A Role In Shaping Cardiovascular Risk In Children With Multifactorial Dyslipidemia

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Introduction: Childhood multifactorial dyslipidemia contributes to the risk of premature cardiovascular events in adulthood. The associations between body composition, lipid profiles and cardiovascular outcomes in pediatric patients with lipid disorders are insufficiently explored.
Methods: This retrospective study reviewed the medical records of 101 individuals (35.6% boys) diagnosed with multifactorial dyslipidemia and referred to the Lipid Clinic. Anthropometric data, pubertal status, and fasting blood samples (lipid profiles, glucose, insulin) were collected. Body composition was assessed via bioelectrical impedance analysis, and physical activity was evaluated using Metabolic Equivalent of Tasks (MET) score. Key indices, including the dyslipidemic atherogenic index (triglyceride [TG]:high-density lipoprotein cholesterol [HDL-c] ratio) and homeostatic model assessment for insulin resistance (HOMA-IR), were calculated. Associations were examined by Spearman's rho tests.
Results: The study cohort's mean age was 13.8 ± 3.2 years, with 16.2% classified as prepubertal. The median body mass index z-score was 2.04 [interquartile range (IQR) 1.47, 2.36], and the median systolic and diastolic blood pressure (BP) percentiles were 90 [IQR 72, 96] and 76 [IQR 57, 87], respectively. Body composition analyses showed a mean fat percentage of 36.2 ± 8.8 and a median muscle-to-fat ratio (MFR) z-score of -1.62 [IQR -1.92, -1.24]. Participants reported a median of 2 hours [IQR 0, 3.9] of physical activity per week, with 35.8% engaging in no exercise, 5.3% in light activity, 25.3% in moderate activity, and 33.7% in vigorous activity. Lipid profile analyses revealed a median TG z-score of 2.41 [IQR 1.69, 2.95], a median HDL-c z-score of -0.78 [IQR -1.38, -0.05], and a median TG:HDL-c ratio of 5.03 [IQR 3.31, 7.56]. The median HOMA-IR was 5.0 [IQR 2.7, 6.8]. Hours of engagement in physical activity negatively correlated with fat percentage ($r = -0.244$, $p = 0.022$) and diastolic BP percentile ($r = -0.336$, $p < 0.001$). Fat percentage positively correlated with both the systolic BP percentile ($r = 0.312$, $p = 0.002$) and the diastolic BP percentile ($r = 0.429$, $p < 0.001$). MFR z-scores negatively correlated with the systolic BP percentile ($r = -0.209$, $p = 0.046$), the diastolic BP percentile ($r = -0.358$, $p < 0.001$), the TG:HDL-c ratio ($r = -0.237$, $p = 0.023$), and the HOMA-IR ($r = -0.326$, $p = 0.013$).
Conclusions: Body composition plays a role in shaping cardiovascular risk among children with multifactorial dyslipidemia. Unfavorable body composition is associated with elevated blood pressure, higher triglyceride levels, and impaired insulin sensitivity. Specifically, excess adiposity is linked to elevated blood pressure percentiles, while a lower muscle-to-fat ratio is associated with a heightened atherogenic index and insulin resistance. These findings emphasize the importance of addressing body composition through tailored lifestyle interventions and clinical management strategies to mitigate future cardiovascular risk in this vulnerable population.

Conflict of Interest: None

Funding: None

PO3.132

Physical fitness cut-off points for early detection of general and central obesity risk in preschoolers: The PREFIT project

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Introduction: Physical fitness in early childhood, including cardiorespiratory fitness and muscular strength, is vital for long-term health. Higher fitness levels are linked to lower risks of cardiovascular disease and obesity later in life1. Although fitness cut-off points for health risks are well-studied in older children, limited data exist for preschoolers, a crucial period for early obesity risk identification2. Therefore, the PREFIT project aims to establish age- and sex-specific cut-off points for physical fitness to facilitate the early detection of general and central obesity in Spanish preschoolers (ages 3-5).
Methodology: A sample of 3,179 Spanish preschoolers (52.8% boys, ages 3-5) was assessed. Physical fitness was measured using the PREFIT battery, including cardiorespiratory fitness (PREFIT 20m shuttle run test) and muscular strength (handgrip and standing long jump tests). Anthropometric data determined general (BMI) and central (waist circumference) obesity, with obesity risk calculated by age- and sex-specific percentiles (>95th and ≥90th, respectively)3. Receiver operating characteristic (ROC) curve analyses were used to establish fitness cut-off points associated with obesity risk4.
Results: Age- and sex-specific fitness cut-off points were identified. For cardiorespiratory fitness, cut-off points ranged from 9.5 to 23.5 laps for boys and 6.5 to 21.5 laps for girls. For muscular strength, cut-off points ranged from -1.5 to 2.2 z-scores in boys and -1.6 to 1.9 z-scores in girls. The cut-off points showed moderate-to-high predictive accuracy (cardiorespiratory fitness: AUC 0.61-0.74; muscular strength: AUC 0.59-0.80) for obesity risk.

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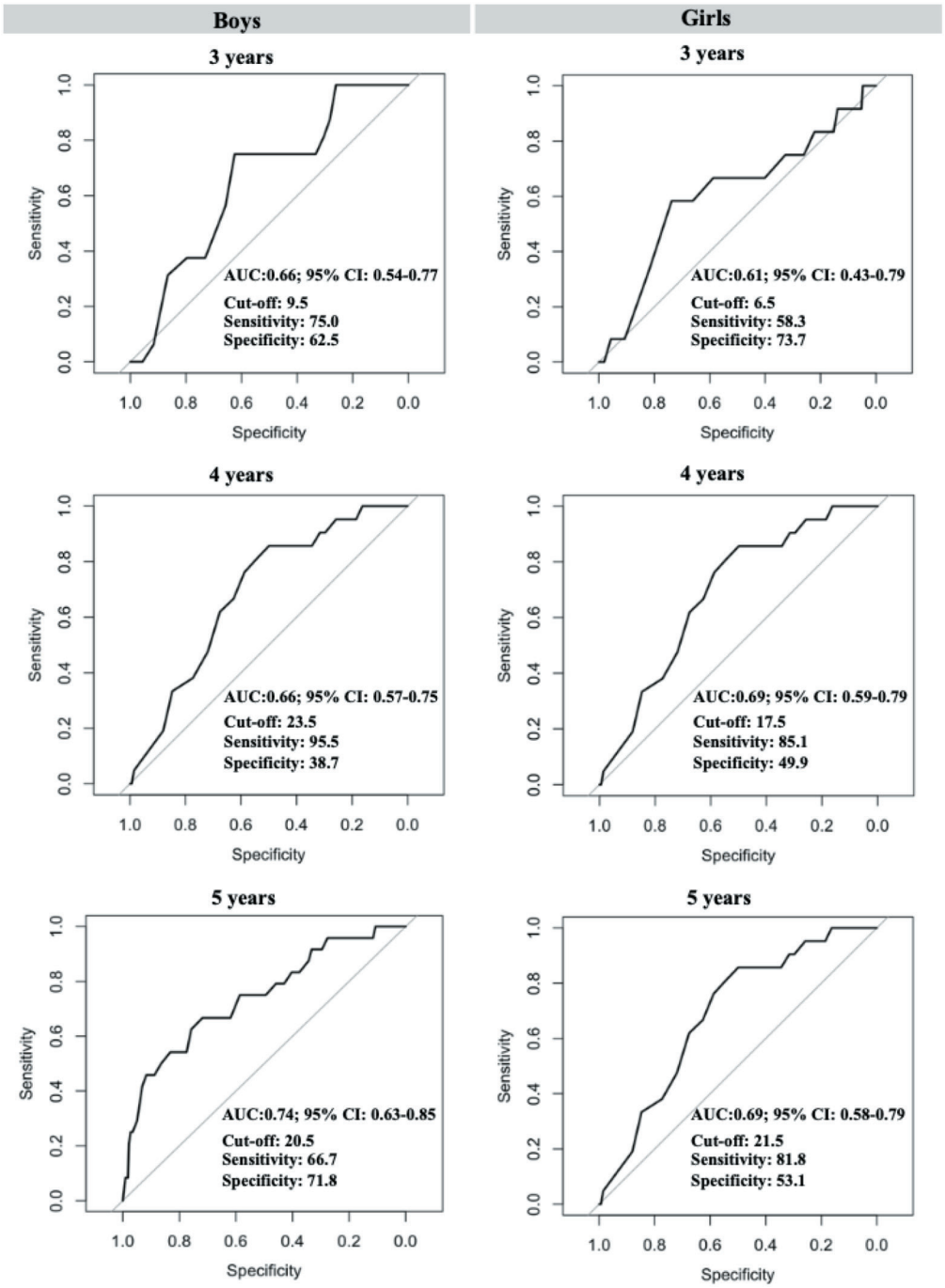


Fig. 1. Receiver operating characteristic curves illustrate the capacity of cardiorespiratory fitness (laps) to identify combined general and central obesity risk in preschool children.

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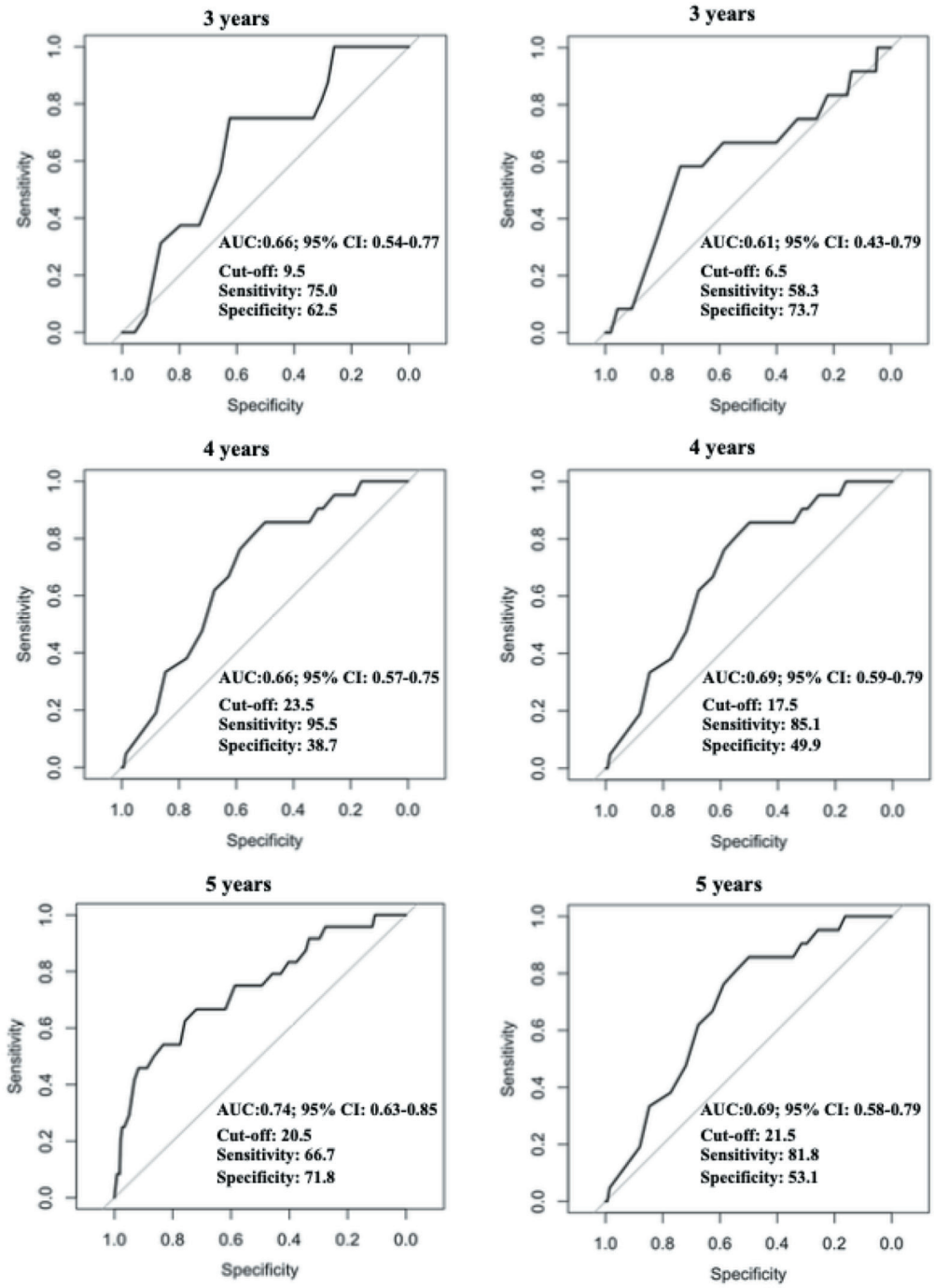


Fig. 2. Receiver operating characteristic curves illustrate the capacity of the capacity of muscular strength (z-score) to identify combined general and central obesity risk in preschool children.

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Conclusion: This study provides age- and sex-specific fitness cut-off points for early detection of general and central obesity risks in preschoolers. These findings highlight the importance of including fitness assessments in early childhood health monitoring to guide specific interventions for cardiovascular health.

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Conflict of Interest: The authors declare no competing interests.

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PO3.133

GLP-1 Receptor Agonists in Children and Adolescents with Obesity: A Systematic Review

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Introduction: The prevalence of obesity (OB) continues to rise among children and adolescents, presenting significant public health challenges. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have emerged as promising treatments, demonstrating effectiveness in this population. This study reviews current evidence on the use of GLP-1 RAs for managing OB in children and adolescents.

Methods: A systematic review (SR) was conducted in PubMed using the search strategy: "((Glucagon-like peptide-1 receptor agonists[MeSH Terms]) OR (semaglutide) OR (liraglutide) OR (GLP-1 agonists) OR (GLP-1 analogue) OR (tirzepatide)) AND ((Children) OR (infancy) OR (teenagers) OR (pediatrics)) AND ((Obesity) OR (overweight))". Clinical trials, meta-analyses (M), randomized controlled trials (RCTs), and SRs published between January 2013 and December 2024 were included. Of the 114 papers retrieved, 27 were deemed relevant after independent screening. Studies focusing on Prader-Willi Syndrome, hypothalamic OB, or exclusively on type 2 diabetes mellitus (T2DM) were excluded.

Results: The review included 13 RCTs and 14 SRs with meta-analyses, covering 925 participants in the RCTs. Drugs evaluated were exenatide (EXE) (15 studies), liraglutide (LI) (17 studies), and semaglutide (SE) (11 studies). Primary outcomes (21 studies) assessed changes in weight, BMI, and BMI-SDS. Secondary outcomes included cardiovascular (CV) risk markers, such as HbA1c, fasting plasma glucose (FPG), serum lipids, and arterial blood pressure. Additional outcomes included quality of life and depressive symptoms, while four studies focused on safety, pharmacokinetics, and pharmacodynamics.

Significant reductions in weight, BMI, and BMI-SDS were reported. An RCT involving 251 adolescents (12–18 years) demonstrated a -4.64% BMI change versus placebo, while another with SE (N = 201) reported a -16.7% estimated BMI reduction. A 2024 meta-analysis observed a mean weight loss of 4.21 kg (7.08–1.35) and a BMI reduction of 2.1 kg/m² (3.6–0.62) across GLP-1 RAs, with SE showing the greatest efficacy. Other meta-analyses found similar results, including a -4.98 kg weight loss (-8.48 to -1.46) and -17.7 kg with SE (-18.89 to -16.51), as well as a -1.71 kg/m² BMI reduction and -5.88 kg/m² with SE.

Evidence on CV parameters was mixed. A 2021 meta-analysis reported a -0.3% change in HbA1c and a -4.0 mg/dL change in FPG, while a 2024 meta-analysis found no significant changes in glucose-related markers but observed a -7.1% LDL cholesterol reduction with SE. An EXE study also reported reductions in inflammatory biomarkers, including IL-18Rα.

GLP-1 RAs were generally associated with mild gastrointestinal adverse effects (AEs), such as nausea, vomiting, and diarrhea. Occasional mild hypoglycemia was reported. No significant increase in serious AEs was observed, although long-term safety data remain limited.

Conclusion: GLP-1 RAs are effective and safe for treating OB in children and adolescents, with semaglutide demonstrating superior efficacy. Further research is needed to evaluate the long-term effects of treatment and its impact on broader health outcomes, including CV risk and quality of life.

PO3.134

Connecting oral to physical health in childhood obesity, a holistic dental and medical collaboration – making every contact count

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Introduction: Dental caries is the most common reason for hospital admission in children aged 5 and 9 years with an estimated cost to the NHS of £40.7 million. Sugar consumption is a shared risk factor for dental disease, obesity and type 2 diabetes. Complications from Excess Weight clinics (CEW) provide children and young people (CYP) living with obesity and associated co-morbidities a holistic plan to achieve healthier lifestyle practices. A unique and multi-faceted interprofessional collaboration was established between a CEW clinic and local dental services in Sheffield, UK, to improve oral health (OH).

Methods: CEW teams have observed a high proportion of CYP are high risk for dental decay and erosion. Many do not access a dentist and come from the most deprived backgrounds. CEW family support workers received OH training from the community dental team in order to address and encourage good oral hygiene during their weight management support home visits. Resources for families were developed by the dental team and embedded in the weight management service's patient app. A specialised commissioning pathway was developed to facilitate improved access to dental care for CEW patients including a bespoke referral route to urgent/routine care recognising this cohort's wider vulnerabilities. Finally, a supervised dental student outreach programme was developed where students provide OH advice, while learning about food and drink preferences, eating patterns, sleep disruption and the influence of social determinants and co-morbidities on oral and general health through a simple and non-stigmatising patient reported questionnaire. Thus a 'one-stop' service model was created for CYP to access OH advice as well as their weight management care. Student reflective reports and CYP feedback will help inform future service development.

Results: This collaboration provides value to CYP & families, by a preventative approach to oral disease, and early intervention. A single visit for medical and preventative dental care minimises time away from education for a CYP and employment absences and travel costs for carers. There has been improved knowledge of oral health by CEW teams, and a greater understanding of childhood obesity by dental teams. CEW teams have incorporated oral health into screening and been able to give powerful messaging around dietary and lifestyle habits and risk to oral health as well as systemic health. Inclusion of student dental professionals in clinics will ensure future dental teams are better equipped to understand common dietary practices in order to address diet for more effective promotion of oral health and to understand the impact of health inequalities on oral health.

Conclusion: This service development champions inter-professional collaboration aligning with the Making Every Contact Count approach and

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CORE20PLUS5. It has potential to improve access to dental care for a high decay risk cohort of CYP and support them with their weight and OH. This model is scalable and by services working together could provide economy of resource.

PO3.135

The integration of a Citizen's Advice (CA) Worker within a Complications from Excess Weight (CEW) clinic multidisciplinary team for childhood obesity

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Introduction: Health outcomes and behaviours are influenced by social determinants. Obesity prevalence is highest among the most deprived groups in society. Children living in the most deprived parts of the country are more than twice as likely to be living with obesity than those in the least deprived areas. In the Sheffield CEW clinic, approximately 70% of patients reside in the two most deprived quintiles.
For these families, the immediate task of daily survival supersedes preventative health measures or action towards improving long term health. Consequently, the capacity to engage in a healthcare plan that needs sustained motivation, such as making dietary changes or increasing activity, or even attending appointments, is significantly hindered, without basic needs of shelter and security being met. A significant amount of healthcare professional time is spent trying to address some of these difficulties causing a delay in progress with weight management.
Methods: In December 2024, a CA worker joined the multidisciplinary team of 3 clinicians, 2 specialist nurses, 1 psychologist, 1 dietitian and 3 weight management support workers for one day a week, as a pilot for a year. Routine screening questions are universally asked of every new patient at their first medical appointment to sensitively enquire if the family face any financial hardship, food insecurity, or concerns about housing that pose difficulties in attending appointments, or affect their resilience or ability to engage with lifestyle management plans. There is often more information provided or observed insights into vulnerabilities during subsequent home visits. If help is required the family is offered a direct referral to CA worker who will contact the family and confidentially help navigate and solve various legal, financial and personal challenges with their expert knowledge of systems. With consent, they report their input back to the CEW healthcare team.
Results: Preliminary findings from the first month of this collaboration with the initial 8 clients referred and seen, have identified 61 issues that they have been supported with. These have included 24 benefits and tax credit issues, 1 requirement for charitable support through a food bank, 10 families facing debt, 2 needing support for education, 1 community care referral, 7 housing issues, 2 tax concerns, 1 travel problem, and 13 difficulties with utilities and communications. Resolution of these problems has resulted in a total income gain of £1194 for these clients.
Conclusion: Without the right expertise within the healthcare team, it is unlikely these issues for families could have been resolved through simple signposting, and many expensive healthcare hours would have been spent in futility. CA workers have the expertise to address multiple related issues simultaneously and not just the ones the families themselves raise. CA has a mediator and advocacy role to take any advice to a greater degree of effectivity. CA addresses Maslow's Hierarchy of Needs by assisting individuals at various levels of the hierarchy and ensuring their basic needs are secured, and will increase the cost-effectiveness of CEW services.

PO3.136

Waist-to-height ratio in 7-year-old Czech children in the years 2008-2023

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Introduction: Childhood obesity is a serious global health problem. Body Mass Index (BMI) may not be the most reliable indicator of obesity in children younger than 9 years old, as it does not account for differences in body composition. The Waist-to-Height Ratio (WHtR) is considered to be a more effective indicator of body fat distribution in children because it is more closely linked to the accumulation of abdominal fat, which is the key factor in assessing health risks of obesity.
Our project is an observational study of 7-year-old children, conducted in collaboration with the European Childhood Obesity Surveillance Initiative (COSI), established by the World Health Organization (WHO). Our project aims to monitor trends in WHtR in children and to evaluate the usability of this index for monitoring body fat distribution in children.
Methods: WHtR above 0.5 was used as the cut-off value for evaluating abdominal obesity in the unique sample of 5703 girls and 5748 boys aged 6.50-7.99 years. WHtR was calculated as waist circumferences (cm) divided by height (cm). The numbers of participants in each COSI round were: 1st round (2008) n=1571 children, 2nd round (2010) n=2483 children, 3rd round (2013) n=2397 children, 4th round (2016) n=1682 children, 5th round (2019) n=2241 children, and 6th round (2023) n=1077 children.
Data were analysed using Statgraphics Centurion, version-XV ($p<0.05$).
Results: The average WHtR values increased during the follow-up period, especially between the start of follow-up in 2008 and 2010, 2016, 2019 and 2023. The exception was the year 2013, when there was observed a temporary decrease in the average index values.
In girls, this trend corresponds with the increasing percentage of WHtR values above 0.5.
Conclusion: We observed the significant increase in average WHtR values of 7-year-old children in the Czech Republic between years 2008 and 2023. This trend was more pronounced in girls than in boys.
BMI is a simple indicator of obesity, but it does not reflect the body fat distribution. This finding highlights the importance of monitoring WHtR in children.

Conflict of Interest: None

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PO3.137

The development of a digital self-management platform and app for children and young adults (CYA) with, or at risk of, Type 2 diabetes (T2D), covering many aspects of lifestyle management towards a healthier weight for prevention and remission

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Introduction: Continuing increase in prevalence of childhood obesity has resulted in early onset T2D in CYA being a rapidly emerging problem evidenced by National Paediatric Diabetes Audit (NPDA) and National Diabetes Audit (NDA) data. In NDA 'Young People with Type 2 report 2021-22' there were 2000 CYP living with T2 diabetes under the age of 18 years, and a staggering 9765 cases 19-25 years. Approximately 70% of CYA with T2D live in the two most deprived quintiles and 55% are from non-white or mixed ethnicity backgrounds. CYA with or at risk of T2D reported 'there are no resources, only for older people', also a lack of

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cultural food representation. Experience of societal stigma was strongly expressed.

Methods: The initial iteration of youngtype2.org was co-designed and launched in 2022. The project was facilitated by 3 main groups:

1. A multi-cultural user group to reflect the diverse cohort of CYA living with obesity and/or T2D, with a multi-disciplinary clinical approval team at Leeds Children's Hospital.
2. A clinical oversight group established to ensure that resources were representative and culturally appropriate.
3. The National Paediatric Network T2 Working Group as stakeholders.

During codesign, CYA stated that content needed to be short and accessible like TikTok videos, and to cater for learning difficulties and language barriers. User testing was then undertaken on the content across 6 sites with 41 CYA completing the testing survey.

Results: Resources have been developed to address many aspects of weight management for prevention and remission of T2D including dealing with stress, increasing activity, takeaway swaps, hidden sugars, portion sizes, unplanned eating, low carbohydrate meal ideas, sleep routine, religious celebrations, cultural diets, tips for motivation and goal setting. 95% found the platform and app could possibly or would be helpful to their self-management 95% would use these resources to train other family members or carers 86% would recommend the platform and app to a friend Improvements have now been made in response to user and HCP feedback. Additional pregnancy and treatment options are almost complete.

Conclusion: Both the app and platform are free of charge to all users and healthcare teams in England. The app is accessed through a unique clinic code, with additional functionalities allowing a clinic to communicate with patients, send alerts, updates, and news items, and house their own resources and contact details for the team. Future developments are underway and will include medications for weight loss and T2D including GLP-1 agonists, including training videos of how to self-administer. There are also plans for resources to support mental health and support for those experiencing stigma or struggling with body image. The information on the platform is supported by a ReachDeck toolbar for accessibility and can be translated into multiple languages. Positive feedback on youngtype2.org supports these resources being adapted for a standalone and bespoke digital tool for chronic relapsing and remitting childhood obesity with the inclusion of information on complications and comorbidities from excess weight.

PO3.138

The ethical, legal and social issues raised by childhood obesity interventions and policies: a systematic qualitative review

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Introduction: Obesity rates have dramatically increased in Europe in the last 40 years, with long-lasting effects on the prevalence of severe obesity, diabetes, cardiovascular disease, premature death, and disability. Avoiding obesity through the life course can be best achieved by preventing children becoming obese and maintaining a healthy weight later at adolescence and young adulthood. However, interventions and policies aimed at preventing or reducing childhood obesity have important ethical, legal, and social implications (ELSI). This aim of this systematic review is to determine systematically the full spectrum of ELSI of childhood obesity intervention and policies.

Methods: A systematic review was conducted on PubMed and included papers dealing with the ELSI of childhood obesity interventions and policies published until September 2023. Data were analyzed and synthesized using qualitative content analysis.

Results: Our literature search retrieved 4,637 publications of which 72 were included in the analysis. We identified 13 key interventions and policies at the individual, community and social level. The 9 major ELSI associated with these interventions and policies included data protection, cost effectiveness, stigma, responsibility, autonomy, uncertainty, structural inequalities, harm, and well-being.

Conclusion: Overarching difficulties regarding childhood obesity interventions and policies related to broader structural inequalities in society, respecting and balancing individual autonomy with improving public health, and the challenge caused by uncertainty around the effectiveness of interventions and policies. Further consideration is needed to prevent or minimize the negative ELSI raised by childhood obesity interventions and policies.

PO3.139

Children and young people's perspectives on obesity treatment and body image: a qualitative study

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Background: Pediatric obesity treatment programs are typically planned, implemented, and evaluated by adults, with limited research incorporating children's perspectives. Some parents may opt their children out of these programs due to concerns about potential negative effects on body image, although research suggests that interdisciplinary obesity treatment can improve body image for many children. This study aimed to explore young people's perspectives on obesity treatment and body image.

Method: Nine participants aged 9–18 years were recruited from an obesity clinic between September 2022 and January 2023. A full-day workshop was conducted in February 2023, using participatory, child-friendly methods to explore the participants' experiences and perspectives on obesity treatment and body image. Four participatory tasks were specifically developed for this study: (1) the 'Photo Memory Task,' (2) the 'Body Image Task,' (3) the 'Ranking Task,' and (4) the 'Plenary Summary Task.' The first three tasks were performed in smaller groups of children (9–13 years) and adolescents (14–18 years) to gain deeper insights into their perspectives. The workshop content was co-developed and quality-assured by four youth experts with prior experience in obesity treatment. Data from all participatory tasks were transcribed verbatim and analyzed using inductive thematic analysis.

Results: Five key themes were identified from the analysis: (1) Content of obesity treatment, (2) Communication with health professionals, (3) Perceptions of obesity treatment, (4) Body image, and (5) Social support from family and peers. Participants discussed several topics regarding the content of obesity treatment, including a lack of information before the first meeting, mixed experiences with weighing, and detailed dietary advice. In terms of communication with health professionals (HPs), younger children sometimes felt excluded from conversations, as they perceived their parents dominated the dialogue. Adolescents emphasized the importance of trust in HPs, appreciating their understanding and non-judgmental approach, but expressed a desire for more time to address mental health concerns and, in some cases, suggested reducing parental involvement. Participants demonstrated detailed knowledge about obesity treatment, and described several healthy lifestyle changes. Positive emotions and experiences were mostly linked to achieving treatment goals, while negative experiences were associated with perceived failures and weight gain. All participants shared experiences of weight-based bullying and the stigma of living with obesity. Finally, support from parents, family members, and friends was described as a vital component of their obesity treatment.

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Conclusion: Children and adolescents are willing to share their experiences with obesity treatment and body image, reporting both positive and negative aspects. Their perspectives are essential for improving future obesity management programs, ensuring that treatment is more child-centered, supportive, and effective in addressing their needs.

PO3.140

Comparative analysis of relative telomere length between individuals with metabolically healthy obesity and metabolically unhealthy obesity

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Introduction: Telomeres are tandem repeat sequences at the terminal regions of eukaryotic chromosomes. During replication, telomeres protect the ends of chromosomes; however, their length gets successively shortened with each round of replication, making them a marker for cellular aging. The primary objective of this study was to investigate the association between telomeres length and the two obesity phenotypes, metabolically unhealthy obesity (MUO) and metabolically healthy obesity (MHO).
Methods: In this cross-sectional study, female-sex adult participants with obesity (≥18 years; BMI ≥30kg/m²) were recruited from an endocrine clinic in Oman. Participants were classified into two groups: participants with Metabolically Unhealthy Obesity (MUO) and participants with Metabolically Healthy Obesity (MHO). Participants were classified to be with MUO if they were affected by any of the following conditions: hypertension, diabetes, dyslipidemia, cardiovascular diseases, or metabolic syndrome. Metabolic syndrome was defined according to the National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP III), in which metabolic syndrome is considered present if three or more out of the following five criteria were met: waist circumference ≥ 88.9 cm, blood pressure ≥ 130/85 mmHg, fasting triglycerides (TG) levels ≥1.7 mmol/L, fasting high-density lipoprotein (HDL) <1.3 mmol/L and fasting blood sugar ≥5.6 mmol/L. Participants were classified to be with MHO if none of the above conditions was present. Blood samples were collected from the participants, and DNA was extracted. Relative telomere length (RTL) was measured using a real-time polymerase chain reaction assay, and RTL was calculated by ΔΔCt method.
Results: A total of 43 female-sex participants matched for age were selected for the study (47.91± 6.09 years). Participants were classified based on their clinical data into one of two groups: participants with MUO (n=21) or participants with MHO (n=22). There was no significant difference in age between participants with MUO (47.86± 5.91 years) and participants with MHO (47.95± 6.38 years) (*t*. test, $p = 0.96$). Moreover, no significant difference in BMI was observed between participants with MUO (BMI: 45.30± 6.11 Kg/m²) and participants with MHO (BMI of 43.76± 6.65 Kg/m²) (*t*. test, $p = 0.44$). Moreover, comparison of the Relative telomeres length (RTL) presented as ΔΔCt revealed no significant difference between participants with MUO (-0.47± 0.93) and participants with MHO (-0.64± 0.96) (*t*. test, $p = 0.58$).
Conclusion: Our findings suggest no association between telomeres length and the two obesity phenotypes (MUO and MHO) of female-sex individuals with obesity.

Conflict of Interest: None Disclosed

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PO3.141

Early learning from 'ENHANCE' - Evaluating the NHs englANd Complications of Excess weight clinics

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Introduction: In 2021/22, NHS England set up 21 Complications of Excess Weight (CEW) clinics across England, with a further 15 added in 2024. The clinics support children and young people who live with severe and complex forms of obesity and related complications. This study aims to undertake a co-produced, comprehensive mixed-methods clinical and economic evaluation of the CEW clinics, which develops the evidence base: understanding optimal models of care, and in doing so contribute to the national CEW clinic framework development, which will support future national roll out and commissioning.
Methods: The evaluation is underpinned by a realist informed approach and comprises five interconnected work packages (WP). WP1 will facilitate coproduction with all stakeholders and embed the experiences of our patient and public involvement (PPI) team into the study design, development and delivery. WP2 will map the delivery and workforce models of CEW clinics using use documentary reviews, surveys, process mapping, semi-structured interviews and focus groups with commissioners and NHS England / CEW staff. WP3 will explore the views and experiences of children, young people and their families attending CEW clinics, using surveys, interviews, questionnaires and focus groups. WP4 will comprise a clinical and economic evaluation to assess service user demographics, analyse clinical, quality-of-life and cost outcomes over time, and provide an economic evaluation of each CEW delivery model. WP5 will use a triangulation protocol to bring together the findings and display them in a convergence coding matrix.
Results: Emerging insights from WP2, 3 and 4 will be presented. WP2 will focus on the context to which CEW clinics were designed and exist, delivery models and workforce, referrals and eligibility criteria, service components, discharge and onward referral. WP3 will provide insights from patients attending the service with regards to their referral experiences, prior knowledge of CEW clinics and their expectations and support needs. WP4 will overview emerging demographic and clinical outcomes, including use of pharmacology of children and young people attending clinics.
Conclusion: The ongoing coproduction of the evaluation with policy makers, clinicians and our PPI team is ensuring the evaluation findings are providing real time insights, to inform ongoing service development and commissioning at a national level.

PO3.142

Nutrition organization of primary school children in Lithuania

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Introduction: Since 2011, schools in Lithuania have been required to comply with the Order of the Minister of Health "On the Procedure for Organizing Children's Meals". The purpose of the procedure was to ensure healthy nutrition of children, food safety and the best quality, so that children's physiological needs for nutrients were met, and healthy eating skills were developed. At school all children must receive hot food, specified in the menu, cooked on the same day. In this abstract we aim to present the

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data about nutrition organization at schools, giving the greatest attention to buffet (Swedish table) experience in Kaunas district schools.
Methods: The survey followed the protocol of the WHO European Childhood Obesity Surveillance Initiative (COSI). Cross-sectional study of a national representative sample of first grade children was performed in 96 schools of Lithuania in 2023. Schools and classes were selected randomly from the list of all primary schools in the country. Stratification was applied by district and level of urbanization. Representatives of selected schools filled in the mandatory School Record Form that involved several characteristics of the school environment.
Results: All the selected schools in ten counties of Lithuania had canteens, also shops or cafeteria where foods or beverages could be purchased strictly following the Order of the Minister of Health. 20.8% of schools had vending machines where children could purchase food or beverages other than water, fruits and vegetables. In 96.9% of schools catering was organized inside school by private companies and in 3.1% - food was delivered in thermoses. 11.5% of schools indicated having a nutrition education course for 7-8-year-old children taught as a separate lesson or integrated into other lessons.
Meals for children are organized by municipalities, so the problem of food waste at schools arises. Kaunas District Municipality - the 6th largest municipality out of 60, has 48 municipal schools and 12 private schools. It has stood out from the others with attention to health-friendly food and organic products, modern production technologies, cozy catering facilities, modern kitchens, food waste control, and focus on the qualification and competence of canteen workers. The Ministries of Health and Education met and have offered Kaunas District Municipality a pilot project and suggested to introduce new tools to change the food culture by using the pupil's self-service (''Swedish table") model.
Conclusions: The conditions created for healthy eating can change the behavior of children. More of them eat at school and don't spend money on fast food in shops near school. Children like the opportunity to choose meals, become more independent, more polite, and learn to use cutlery. The food is healthier, always hot, as it is taken just before eating. Healthy eating skills, eating culture, and the responsibility for uneaten food improved - significantly less food was wasted.

PO3.144

Before screen time and dietary habits as predictors weight gain problems in adolescence

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Introduction: Physical activity is known as a cornerstone for weight maintenance throughout life. Spending expanded time before TV, phone and computer is related to decrease in physical activity and together with inappropriate dietary habits reflect in weight gain problems. The aim of our research is to estimate correlation between before screen time, physical activity level and diet as predictors of weight gain in adolescence.
Methods: We studied 128 boys and 134 girls in a country region (mean age 12.02±3.03 years, mean BMI 20.38±4.36 kg/sq.m). Children and their parents were asked to fill in questionnaires to find out the level of physical activity and dietary habits. Timer on smart phone was used to calculate the exact time spent in sports, open air activities, before screen time and sleep time. Correlations between parameters were assessed.
Results: 67.1% of subjects answered to spend between 60-180 minutes per day in open air activities – football, jogging, etc. (no gender difference with little prevalence of boys at higher age subgroups). Before screen time (defined as before TV screen, smartphone, computer, etc.) for 49.25% of girls and 31.25% of boys was limited to be between 60 and 120 minutes per day. BMI demonstrated high positive correlation with average time spent in physical activity (phi=0.782, $p<0.05$) and high negative correlation with before screen time (phi=-0.674, $p<0.05$). Eating habits showed no correlation with weight gain.
Conclusion: Before screen time and relevant physical activity are important predictors for weight gain problems in adolescence. Eating habits contribute but have lower influence and could be compensated for with exercise and avoiding a sedentary lifestyle.

PO3.145

Before screen time and dietary habits as predictors of weight gain problems in adolescence

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Introduction: Physical activity is known as a cornerstone for weight maintenance throughout life. Spending expanded time before TV, phone and computer is related to decrease in physical activity and together with inappropriate dietary habits reflect in weight gain problems. The aim of our research is to estimate correlation between before screen time, physical activity level and diet as predictors of weight gain in adolescence.
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PO3.146

Hypogonadism in patients with Prader-Willi syndrome: Genital and Pubertal Assessment

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Introduction: Prader-Willi Syndrome (PWS) is the most common cause of genetic obesity, with an incidence of approximately 1 in 15,000 live births. It results from a typically spontaneous genetic error that leads to the loss of expression of paternal genes on chromosome 15, which are essential for hypothalamic development. The hallmark feature of PWS is hyperphagia, which leads to obesity, often severe, and represents the primary cause of morbidity and mortality. While obesity is a major concern for endocrinologists managing PWS, hypogonadism is another significant manifestation. Its pathophysiology is likely multifactorial, involving a variable combination of gonadal failure and central dysfunction. Clinically, hypogonadism in PWS is characterized by genital hypoplasia, cryptorchidism in males, pubertal insufficiency, and infertility.

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Methods: This study analyzed gonadal function disorders in 50 patients with PWS aged 7 to 18 years, who were followed up at our center. The evaluation was primarily clinical and included a general physical examination, anthropometric measurements, and genital examination to determine Tanner pubertal staging.
Results: Of the 50 patients with PWS evaluated, 33 were female, and 17 were male. Among females, 8 (24%) presented with hypoplasia of the labia minora, while only 1 male exhibited scrotal hypoplasia. No cases of absence of the clitoris or labia minora were reported. Cryptorchidism, either unilateral or bilateral, was observed in 12 of the 17 male patients (70%). Regarding pubertal development, 7 patients in the cohort experienced precocious puberty. Most patients initiated puberty spontaneously, with only 4 requiring hormonal therapy to induce puberty due to the absence of Tanner stage 2. A separate analysis was conducted for the subgroup of patients aged 16 to 18 years (inclusive), consisting of 7 females. All patients in this subgroup experienced spontaneous puberty and reached Tanner stage 4. Among these, 3 had menarche, while the remaining 4 did not, despite adequate progression of secondary sexual characteristics. Of the 3 patients who achieved menarche, 2 subsequently developed menstrual disorders: one with hypermenorrhea and another with secondary amenorrhea.
Conclusion: Hypogonadism in PWS demonstrates wide clinical variability, resulting from differing degrees of gonadal involvement and hypothalamic dysfunction. Genital hypoplasia is a common finding, as is cryptorchidism, whose appropriate management is essential to prevent additional gonadal impairment in the context of central dysfunction. Females with PWS often initiate puberty spontaneously but frequently exhibit subsequent menstrual irregularities. Identifying a specific marker for hypogonadism in PWS could prove valuable for its clinical management.

Conflict of Interest: None disclosed.

Funding: No funding to report.

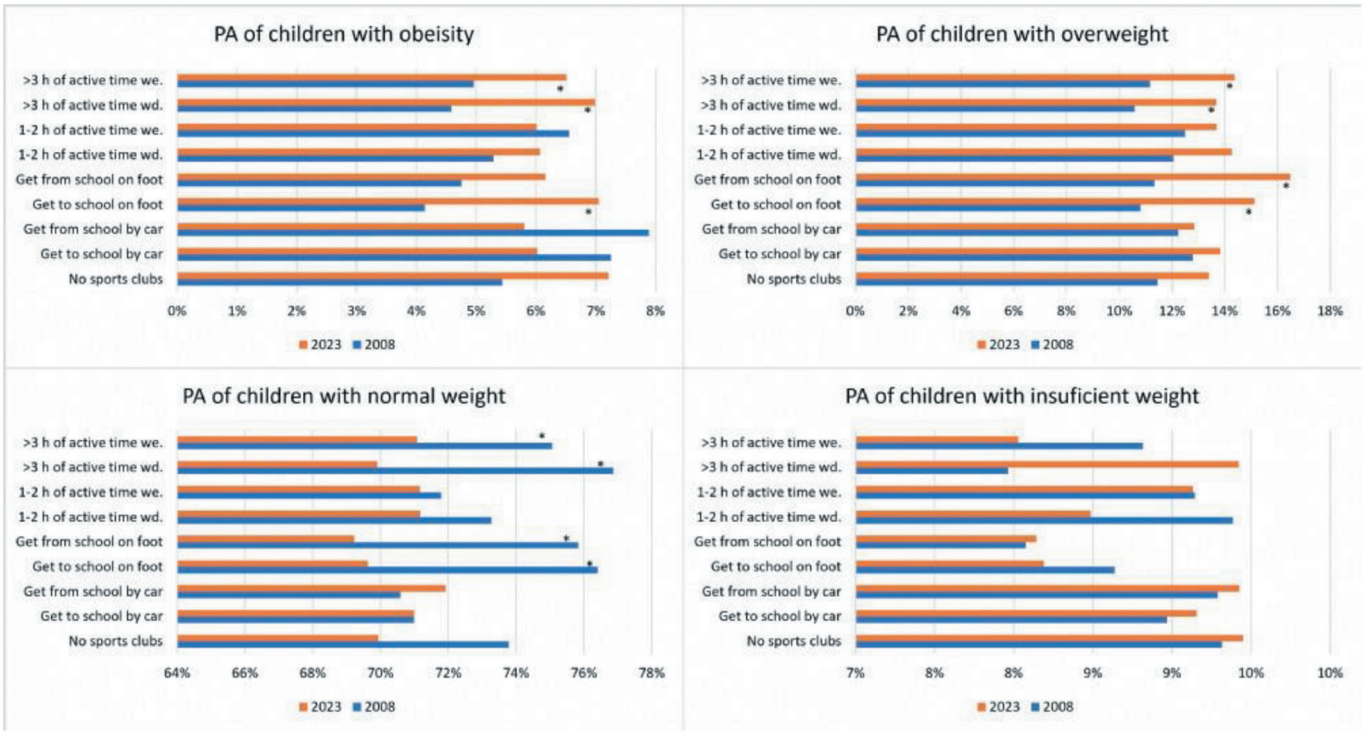
PO3.147

Changes in Physical Activity of First Grade Lithuanian Children during 15 Years of the Surveillance

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Introduction: Monitoring children's growth is essential for evaluating growth patterns and determining their nutritional status. In 2007, the World Health Organization (WHO) launched the European Childhood Obesity Surveillance Initiative (COSI) to routinely measure key anthropometric indicators - height and weight - of primary school children and assess changes in the nutritional status of 6-9-year-old children. Lithuania joined the initiative since its very beginning in 2007. This study aims to analyze and compare the trends of physical activity (PA) in Lithuanian first-graders with insufficient, normal weight, overweight and obesity during a fifteen-year period.
Methods: The first COSI data collection round was conducted in 2008 and the 6th in 2023. The data was collected following a WHO protocol, measurement procedures and questionnaires that included a Family Record Form completed by parents with specific questions about their children's PA. Cluster sampling method (county, school and class) was employed for composing a national representative sample. Children's BMI was calculated and assessed based on the IOTF cut-offs (2012).
Results: Figure 1 shows the main findings of the study related to different physical activity or inactivity. No significant differences were observed between percentages of children in the years 2008 and 2023 in all nutritional status groups: 1-2 h of active time spent playing during weekdays and weekends; getting to and back from school by car; children who were not members of sports/dancing clubs or did not do sports or dance at all. Significant differences in all body mass composition groups (excluding children with insufficient weight) between percentages of children in the years 2008 and 2023 were as follows: more than 3 h of active time spent playing during weekdays (chi² = 12.3, p = 0.006) and weekends



* Indicate significant results between the years (p <0.05). we. – weekend, wd. – weekday.

Fig. 1. Comparison of physical activity of children with different nutritional status between the years 2008 and 2023.

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(chi² = 18.5, p <0.001); getting to (chi² = 20.4, p <0.001) and back (chi² = 19.5, p <0.001) from school on foot (excluding children with obesity).
Conclusion: Over the period of 15 years positive changes between links of nutritional status and physical activity were observed.

PO3.148

Comprehensive family based weight management intervention for children with Complex Health Needs: Service Evaluation of Children Weight Management Service

Adwan, A.; Babber, R.; Sirin Ayva, A.; Roast, J.; Edwards, S.; Gately, P.
MoreLife UK

Introduction: Children living with complex health needs (CHN) such as autism spectrum disorder (ASD) are at greater risk of excess weight gain (1). The contributing factors to obesity this group includes selective eating patterns, disordered sleep, obesogenic medication, as well as social challenges impacting participation in physical activity (1). The gold-standard intervention for weight loss in children is family based intervention(2). MoreLife, Medway and Swale online weight management service offers 1:1 support for children with a BMI ≥98th centile. Families are given tailored support and advice in line with evidence based guidance. Sessions are offered weekly for the first 12 weeks, with regular check-ins thereafter. This intervention offers a multidisciplinary approach, with families having access to a specialist nurse, specialist dietitian, registered nutritionist and psychotherapist.
Method: Feedback and outcomes were gathered through an online questionnaire sent to parents upon joining the program. This questionnaire included validated tools including the Child Eating Behaviour Questionnaire (CEBQ). Weight measurement included weight reported by parents.
Results: Of the total referrals made to our specialist weight management service, 31 participants (39%) had a diagnosis of ASD or ADHD. Mean age was 11 years, and 58% were males. The responses to initial questionnaire on child eating behaviour recorded that all of these children 'never' or 'rarely' enjoyed a variety of food, 'always' refused new foods at first, and are 'always' or 'often' difficult to please at mealtimes. The flexible appointment times and remote phone consultations and individualised support facilitated 100 % retention rate, high engagement with their scheduled appointments. Feedback from families of children with CHN reported several positive changes, including increased willingness to try new foods, improved quality and variety of foods, and improved energy and concentration levels at school. Weight measurement outcomes suggested some improvements with weight loss ranging from 2.5- 3Kg.
Conclusion: Whilst children living with CHN exhibited common difficulties around food, the service proved effective in cultivating positive changes to promote healthy eating guidelines and established acceptability and feasibility of family based intervention in this group.

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Conflict of Interest: None.

Funding: None

PO3.149

The role of Bulimia Nervosa in hormonal and metabolic profile, as well as in menstrual pattern, of overweight and obese adolescents

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Introduction: The aim of this study is to assess the differences between overweight (OW) and obese (OB) adolescents with (BN+) or without (BN-) Bulimia Nervosa regarding menstrual patterns, Sex Hormone-Binding Globulin (SHBG), Testosterone (T), Free Androgen Index (FAI), Insulin and ovarian ultrasonographic (U/S) characteristics.
Methods: Prospective study of 32 BN+ compared to 67 BN- OW & OB adolescents matched for age, BMI, WHR and Waist Circumference. Menstrual patterns were recorded, SHBG, T, FAI, glucose and Insulin were measured, while ovarian U/S characteristics were assessed in all girls.
Results: 21/32 BN+ and 26/67 BN- girls reported oligomenorrhea, amenorrhoea or polymenorrhea (65,6% vs 38,8%, p=0.012). Mean fasting Insulin levels (27.32 vs 22.74 mIU/L), mean fasting Glucose levels (107.7 vs 96.16 mg/dl) mean serum T levels (1.46 vs 1.12 ng/ml), mean FAI (7.6 vs 4.6) and mean SHBG (66.65 vs 84.34 nmol/l) where significantly different in BN+ compared to BN- OW and OB adolescents (all p<0.05). There was no significant difference in U/S ovarian characteristics between the two Groups.
Conclusion: BN+ OW and OB adolescents, independently of body weight or fat distribution, are in greater risk to present menstrual disorders, fasting glucose and Insulin disorders, as well as hyperandrogenemia compared to controls. A multidisciplinary approach is always indicated for these patients with a seriously unhealthy hormonal and metabolic profile, while further studies, with greater sample are needed to confirm these results.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO3.150

Polygenic scores of plasma triglycerides and body mass index in prepubertal children are strong determinants of adolescent hypertriglyceridemia in a Chilean pediatric cohort

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Introduction: Obesity and plasma lipids are risk factors for cardiovascular disease. We derived Polygenic Scores (PGS) for plasma triglycerides and hypertriglyceridemia (HTG) in a pediatric population-based cohort in Chile, assessing the applicability of a multi-ancestry PGS previously derived in international cohorts.

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Aim: To assess the association and predictive capacity of a multi-ancestry PGS for plasma triglycerides, plasma lipids in childhood at prepubertal age, and prepubertal Body Mass Index (BMI) z-score to predict HTG in adolescence.
Methods: Participants (n=532) of a population-based study in Santiago (Chile) with available measurements of Body Mass Index (BMI) z-score and plasma lipids (triglycerides, total cholesterol, HDL-cholesterol) obtained during childhood (Tanner 1; 6.8±0.4 years; mean ± standard deviation) and adolescence (Tanner 4; 12.1±1.4 years). Participants were genotyped using the genome-wide MEGA-Illumina array (>1.7 million gene variants). The multiethnic PGS PGS003816 (>1 million gene variants; developed in >1.6 million individuals, including 350,000 of non-European ancestries; doi: 10.1038/s41586-021-04064-3) was retrieved from the PGS catalog (https://www.pgscatalog.org/) and calculated using directly genotyped and imputed gene variants of our cohort. Multiple logistic regression models assessed the association and interactions between PGS003816, BMI z-scores, and plasma lipids in determining adolescent HTG (plasma triglycerides ≥ 130 mg/dL). The area under the Curve (AUC) for the Receiver Operating Characteristic (ROC) was used to evaluate the predictive capacity of predictors.
Results: The PGS003816 showed significant correlations with plasma triglycerides in both prepubertal childhood (rho=0.13, p=0.004) and adolescents (rho=0.24, p<0.0001). BMI z-score in prepubertal age was the most significantly associated variable with HTG later in adolescence (Odds Ratio, OR: 1.63; 95% Confidence Interval, CI: 1.39-2.08; p<0.0001), with a significant contribution of plasma triglycerides in the prepubertal age (OR per 1-standard deviation: 1.32; 95%CI: 1.04-1.67; p=0.02). No significant associations were found for other prepubertal plasma lipids to predict adolescent HTG after adjustment by age and sex ("clinical model" 1). The additional inclusion of PGS003816 ("clinical + PGS" model 2) indicated a still very significant effect of BMI z-score (p<0.0001) and PGS003816 (OR per 1-standard deviation: 1.66; 95%CI: 1.31.2.15; p<0.0001) in determining HTG in adolescents. In comparison to model 1, model 2 significantly improved the prediction capacity of HTG in adolescents (AUC-ROC model 1: 0.66; p<0.0001; AUC-ROC model 2: 0.71; p<0.0001; p for difference=0.024). No significant statistical interaction was found between BMI z-score at prepubertal age and polygenic scores of plasma triglycerides (0=0.26).
Conclusion: Polygenic scores of plasma triglycerides and BMI-z score in the prepubertal age are strong determinants of adolescent hypertriglyceridemia.

PO3.151

Morelife Physical Activity Club: an adventure therapy-based weight management approach for children and young people

SIRIN AYVA, A. B.; Nicholls, E.; Shiplee, G.; Roast, J.; Edwards, S.; Gately, P.
MoreLife UK

Introduction: Today nearly a third of children aged 2 to 15 are living with overweight or obesity1. Living with obesity also have an impact on mental health2.
MoreLife UK delivers tailor-made, evidence-based and psychologically informed health improvement programmes to individuals and families. However, attendance at a weight management programme is an ongoing issue for children and young people and their families. Parents can be reluctant to attend these programmes due to the fear of stigmatisation and discrimination towards obesity3,4. Often these weight management programmes are labelled as 'fat club' by other kids5.
Morelife created a unique weight management programme for children and young people. This programme is designed based on Adventure Therapy (Experiential Learning) and storytelling approaches to improve their wellbeing and tackle discrimination towards obesity. The programme aims to help children living with obesity to pursue a healthy lifestyle while managing their weight.
Method: The programme is aimed at children living with obesity and their families. It has 10 weekly sessions to cover obesity-related topics, such as nutrition, physical activity, sleep, and stress via adventure therapy activities. There is also complementary parental intervention such as family webinars, online meetings, and digital programmes. Morelife created a Healthy Behaviours Questionnaire to monitor nutrition, screen time and sleep and stress. The questionnaire has 3 subscales (Nutrition: 12 questions, Screen Time: 3 questions, Sleep: 6 questions) 21 questions in total with visual aids to make it more engaging for children and young people. We implemented this questionnaire to monitor healthy behaviours before and after the programme.
Results: Thirty-seven children and 30 parents completed the pre and post Healthy Behaviour Questionnaire. Some of the results are shared below:

- The number of children who have stated that they do not like eating new fruits and vegetables has significantly decreased from 6 in the pre-programme questionnaire to 1 in the post-programme questionnaire. The percentage of children who are eating three or more portions of fruit and vegetables per day has increased from less than a third (32%) to more than half (51%)
- The percentage of parents who think their children know what a balanced diet is has increased from less than 50% to over 80% after completing the programme
- 87% of the parents think that their children have become more aware of what a balanced diet looks like since starting the programme
- The most common changes made at home to help them eat a balanced diet were more fruits and vegetables, reduced sugar and smaller portions.
- No significant changes or reductions in screen time rated by children, but there is more requirement for activities and parents are finding ways to help their children be more active
- The number of children who are waking up full of energy has increased from 14% to 22%

Conclusion: Morelife PA club is effective on improving nutrition, physical activity and sleep. Further data is required to analyse long term effects of this programme.

Conflict of Interest: None

Funding: None

PO3.152

Outcomes of Physical activity referral scheme (PARS) pilot programme with Client Feedback

Sirin Ayva, A. B.; Taylor, A.; Roast, J.; Edwards, S.; Gately, P.
MoreLife UK

Introduction: More Life is a healthy lifestyle provider across the UK. Physical activity referral scheme (PARS) is granted by MoreLife to provide assessments of children and young people (CYP) and their families with the aim of increasing their uptake of community-based physical activity, and, to reduce sedentary behaviours.
This programme has been running since June 2021, allowing health and social care professionals to refer children into the service if they meet the eligibility criteria of ages between 5 and 17 and 91st Centile and above (prioritising 96th centile and above).
Methods: Junior PARS is a 10-week social prescribing programme that connects children and young people aged 5-17 to fun sports and activities in their local neighbourhood. In this programme, Morelife also provides simple tips and advice on how to eat healthy and improve a healthy lifestyle. More Life accepts referrals from health professionals or clients and their families. The programme offers an initial assessment, week 1 and 5 reviews, and an end assessment.
Measurements: The WHO-5 is a self-report instrument measuring mental well-being
Results: Morelife had 210 referrals between October 2023 and July 2024 and 179 actively engaged clients.

- At the start of the 10 weeks, the average amount of physical activity the client engaged in was 2.7 days per week; after the 10 weeks, physical activity increased to an average of 3.9 days per week

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- The average starting weight was 65.97kg, which was reduced to an average of 65 kg
- 77 % achieved their goal of increasing physical activity
- The average BMI centile at referral was 99.4 and reduced slightly to 99.3 post-intervention
- At the start of the 10-week program, the average well-being score (WHO-5) was 69. After 10 weeks, the average well-being score increased to 77, reflecting the positive impacts of attending the program

100% of completers reported they would continue with the activity moving forward Selected parent feedback regarding the programme:
"When she started basketball she was really struggling but is now more confident."
"He is more social and interactive with others"
"He has made positive changes to his BMI, he can run faster and has more stamina."
"He has started to sleep through the whole night, due to his sugary food swaps for fruit after Tea and is now waking up with more energy to start the day"
Selected client feedback regarding the programme
"I like being active and in control of my mind and body"
"I found exercise tricky at first but I'm getting used to it".
"I Made improvements to exercise more than I expected."
Conclusion: The PARS programme has been shown to be an effective way of increasing physical activity and well-being in children and young people. However, long-term evaluations are needed to determine the programme's long-term effectiveness on physical activity and weight.

Conflict of Interest: None

Funding: None

PO3.153

Dysfunctional Uterine Bleeding as an early sign of Polycystic Ovary Syndrome during adolescence

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Introduction: The aim of this study is to assess the causes, evaluation and management of adolescent females who sought care in our Division due to Dysfunctional Uterine Bleeding (DUB), as well as to estimate the correlation between DUB and Polycystic Ovary Syndrome (PCOS) in these girls later in their life.
Methods: Retrospective study of the records of adolescent females who presented in our Division, from 03/2014-03/2024, due to DUB. In all females the diagnosis of DUB was set after the exclusion of a possible pregnancy, hematologic disorders, pathology of female genital tract, endocrine disorders, trauma, medication or other causes. Ultrasound scan or other imaging exams were performed as needed. All of the patients had a long term follow-up, every 6 months. The Rotterdam criteria were used for the diagnosis of PCOS.
Results: A total number of 112 patients, with the diagnosis of DUB and mean age of menarche 12.04 ± 1.63 years, mean age at first attendance 13.46 ± 3.07 years and mean Body Mass Index at first attendance 20.65 ±5.74 Kg/m2 were included in the study. Thorough laboratory investigations indicate that all DUB cases were due to immaturity of the hypothalamic-pituitary-ovarian axis. In 23 patients admission to the hospital was required. Oral Contraceptives pills administration was used in all patients. In 74 females, during their long term follow-up, the diagnosis of PCOS was set. A statistically significant correlation (P<0.01) was shown between DUB during the first 2 years after menarche and PCOS later during adolescence.
Conclusion: DUB is a potentially life threatening condition that needs proper evaluation and management. Our study indicates that statistically significant portion of DUB patients proceed to developing PCOS later in life. Proper management of the two distinct conditions in the young patients is essential.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO3.154

Multimodal health behaviour-changing interventions for children living with obesity – a Cochrane review with meta-analyses to inform the evidence-based guideline by the WHO

Franco, J. V. A.[1]*; Guo, Y.*[1]*; Bongaerts, B.*[1]*; Metzendorf, M.-I.*[1]*; Hindemit, J.*[2]*; Aqra, Z.*[1]*; Alhalahla, M.*[1]*; Tapinova, K.*[3]*; Villegas Arbelaez, E.*[4]*; Alade, O. T.*[5]*; Rodriguez, M. M.*[6]*; Rees, K.*[7]*; Al-Khudairy, L.*[7]*; Torbahn, G.*[8]*; Ells, L. J.*[9]

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Background: Childhood obesity is a global public health problem with multifactorial causes. The first-line approach for managing obesity are multicomponent health-behaviour and lifestyle interventions (HBLT). However, previous research highlighted uncertainty about the sustainability and long-term results of these approaches. Therefore, we systematically assessed the effects of multimodal HBLT for children living with common obesity (CLwO) aged 0 to 9.
Methods: On 28 February 2024, we searched CENTRAL, MEDLINE, PsycINFO, CINAHL, LILACS, and trial registers for randomised controlled trials (RCTs) of multicomponent HBLT (minimum of 12 months (mo) of follow-up (FU)) in CLwO, without publication status or language restrictions. Outcomes were prioritized by the WHO Guideline Development Group and included critical (e.g., physical/mental well-being, physical activity (PA), quality of life (QoL), obesity-associated disability, adverse events (AEs), BMI z score and important (e.g., BMI, obesity-related coexisting conditions, blood pressure, adiposity and fat distribution, laboratory biomarkers) outcomes. We used methods as proposed by Cochrane review standards (e.g. assessing risk of bias (Cochrane RoB tool), certainty of evidence (CoE; GRADE), random effects meta-analyses).
Results: We included 34 RCTs (n=6,849 participants) aged 4 to 9 from high-income countries. We identified 11 community (schools, community centres) and 23 healthcare-based (primary care, hospitals) interventions. Three RCTs targeted parents directly, while the other used family-based approaches through individual or group sessions. Healthcare-based HBLT may improve physical well-being (Pediatric Quality of Life Inventory (PedsQL): standardized mean difference (SMD) 0.05, 95% confidence interval (CI) -0.09 to 0.19; 2 RCTs; n=757; moderate CoE), but result in little to no difference in mental well-being (PedsQL emotional or psychosocial scores SMD 0.02, 95% CI -0.12 to 0.16; 2 RCTs; n=757; moderate

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CoE) at 12 mo FU. Objectively measured PA may increase at 12 mo FU (SMD 0.23, 95% CI -0.16 to 0.63; 3 RCTs; n=278; low CoE), but not at 18 mo FU. They likely result in little to no difference in QoL at 12 mo FU (PedsQL mean difference (MD) 0.36, 95% CI -1.18 to 1.90; 5 RCTs; n=921; moderate CoE). We are uncertain about intervention effects on AEs (3 RCTs; n=614 very low CoE). There may be little to no effect on BMI z score at 12 mo (MD -0.15, 95% CI -0.23 to -0.06; 16 RCTs; n=2397; very low CoE), with similar effects at 18, 24 and 48 mo FU (low CoE). We identified no data on obesity-associated disability. Community-based HBLT showed mainly comparable effects for physical and mental well-being and QoL, while effects for PA and BMI z score were less pronounced.
Conclusions: Multimodal HBLT may have small long-term effects on critical patient-important outcomes and other objective measures such as anthropometry. Future research should consider innovative approaches to the care of CLwO and involve diverse populations, as we found limited research conducted in disadvantaged and culturally/ethnically diverse populations and other low-resource settings.

PO3.156

Physical inactivity predisposes to obesogenic lifestyle patterns in early adolescence

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Introduction: Physical inactivity is a significant determinant of health, strongly associated with unfavourable outcomes, including visceral fat accumulation, obesity, and an increased risk of type 2 diabetes and cardiovascular diseases. It plays a substantial role in the global burden of chronic diseases, increasing healthcare costs. The study explored associations between physical inactivity and lifestyle behaviours, including sleep duration, screen time, and dietary patterns in students aged 10- 15.
Methods: A cross-sectional study was conducted in middle schools across Tirana, involving students aged 10–15. Participants completed a questionnaire regarding their physical activity levels after school and on weekends and their daily screen time and sleep duration. Additional data on dietary habits were also collected. Recognizing the significant impact that even minor changes in physical inactivity habits can have, students were categorized into two groups: "physically inactive" (those who did not participate in extracurricular physical activities) and "physically active" (those who engaged in any form of physical activity or sports, irrespective of meeting recommended physical activity guidelines). Binary logistic regression models assessed the relationship between physical inactivity and lifestyle behaviours.
Results: The study included 2020 participants, 51.1% of whom were boys. 336 students (16.6%) were not engaged in physical activity except for the physical education classes at school: 26.01% of girls and 7.65% of boys. Physically active early adolescents spent 7.57 ± 3.94 hours per week in physical activity (range: 3-40), while physically inactive spent only 2.25 ± 0.00 hours per week.
Girls have a greater risk of being physically inactive than boys, RR = 3.39; 95% CI: 2.68-4.30; P < 0.0001.
Students who participated in any extracurricular physical activity were likelier to consume more than three portions of fruits and vegetables daily: OR = 1.49; 95% CI: 1.07-2.08; P = 0.01.
Physically inactive students spent more time in front of screens compared to physically active students, respectively, 3.11 ± 1.92 (0-14) hours and 2.64 ± 1.67 (0-11) hours, P < 0.0001. They have a greater risk of consuming food in front of screens OR = 1.73; 95% CI: 1.13-2.63; P = 0.01, compared to physically active students.
Sleep duration per night was higher for students who did some extracurricular physical activity than for students who did not do any physical activity, respectively 8.72 ± 1.02 (5-13) and 8.56 ± 1.05 (5-11), P = 0.009.
Conclusion: Physically inactive children and adolescents have unhealthier dietary and lifestyle patterns than their physically active peers; they consume fewer fruits and vegetables than recommended, spend more time in front of screens, consume energy-dense food in front of screens and have a shorter sleep duration. Efforts should be made to address physical inactivity by developing policies that promote regular physical activity and participation in diverse sports among children and adolescents.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO3.158

Implementation Fidelity of a pilot Tier 3 Child Weight Management Service: A Process Evaluation

Sanders, G.; Sirin Ayva, A. B.; Roast, J.; Edwards, S.; Gately, P.
MoreLife UK

Introduction: England is facing an obesity epidemic. By the time children enter primary school, 1 in 4 are already living with overweight or obesity &, by the time they leave primary school, that figure increases to 1 in 3. Tackling obesity & its causes is high on the public health agenda & it is clear that there is no simple solution. It is recommended that process evaluations of implementation fidelity become an integral part of the conduct of all health behaviour intervention research. The current study evaluated implementation fidelity of a pilot digital tier 3 child weight management service in the southeast of England.
Methods: A pragmatic sample of 14 individual interviews & 4 focus groups were conducted. This resulted in a total of 36 (15 male) individuals comprising service staff across senior management (n = 1), team lead (n = 1) & practitioner (n = 4) roles, as well as service clients comprising of children & young people (n = 19) & significant others (n=11). Questions for interviews & focus groups were structured around the PRECEDE stage of the PRECEDE–PROCEDE model of health programme design, implementation & evaluation. Questions addressed knowledge, attitudes & beliefs towards health behaviour change, as well as views on barriers & opportunities for pilot participation. All data were transcribed verbatim. Thematic analysis was then conducted with outcomes represented as pen profiles which presents findings from content analysis via a diagram of composite key emerging themes.
Results: Positive views of the service were highlighted by children, young people & significant others across the key themes of: Programme staff & structure; family engagement & support; lifestyle changes; health & weight outcomes; & emotional & psychosocial wellbeing. With regards to service staff, mixed degrees of implementation fidelity were noted across the key themes of: Family engagement & support; staff meetings & training; programme structure; & client outcomes. Lessons learned showed that the program's structure & supportive approach resulted in high retention rates & consistent session attendance. This indicated strong client commitment & satisfaction. Furthermore, significant weight loss, improved physical health, & enhanced emotional wellbeing were noted highlighting service effectiveness. Overall, clients were making healthier lifestyle choices, which was reflected in both physical health improvements & positive behavioural changes.
Conclusion: This process evaluation represents one of the first efforts to document implementation fidelity of an ongoing tier 3 child weight management service. The findings of which have subsequently informed the design, delivery & recruitment strategies of the service. In the context of child weight management services, the ubiquity of digital technologies & their adoption into day-to-day life translates into greater potential reach than traditional health behaviour change interventions, & consequently, greater potential for positive public health impact. Results can be used to conceptualise best practices as a process to further strengthen the design, delivery & recruitment strategies of the pilot.

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PO3.159

Multimodal health behaviour-changing interventions for adolescents living with obesity – a Cochrane review with meta-analyses to inform the evidence-based guideline by the WHO

Franco, J. V. A.[1]*; Guo, Y.*[1]*; Bongaerts, B.*[1]*; Metzendorf, M.-I.*[1]*; Hindemit, J.*[2]*; Aqra, Z.*[1]*; Alhalahla, M.*[1]*; Tapinova, K.*[3]*; Villegas Arbelaez, E.*[4]*; Alade, O. T.*[5]*; Rodriguez, M. M.*[6]*; Rees, K.*[7]*; Al-Khudairy, L.*[7]*; Torbahn, G.*[8]*; Ells, L. J.*[9]

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Background: The first-line approach for managing obesity is multimodal health-behaviour and lifestyle treatment interventions (HBLT). However, previous research highlighted uncertainty about the sustainability and long-term results of these approaches. Therefore, we systematically assessed the effects of multimodal HBLT for adolescents living with common obesity (ALwO) aged 10-19.
Methods: On 28 February 2024, we searched five databases and two trial registers for randomised controlled trials (RCTs) of multicomponent HBLT (minimum of 12 months (mo) of follow-up (FU)) in ALwO, without language restrictions. Outcomes were prioritized by the WHO Guideline Development Group and included critical (e.g., physical/mental well-being, physical activity (PA), quality of life (QoL), obesity-associated disability, adverse events (AEs), BMI z score and important (e.g., BMI, co-morbidities, blood pressure, adiposity and fat distribution, laboratory biomarkers) outcomes. We used methods as proposed by Cochrane review standards (e.g. assessing risk of bias (Cochrane RoB tool), certainty of evidence (CoE; GRADE), random effects meta-analyses).
Results: We included 33 RCTs (n=5,949 participants) primarily from high-income countries, of which 13 included community (schools, churches, community centres) and 20 healthcare-based (primary care, hospitals) interventions. One RCT targeted parents or ALwO only, the remaining used family-based approaches (individual or group sessions). Healthcare-based HBLT may result in no difference in physical well-being (multiple scales,standardized mean difference (SMD) 0.13, 95% confidence interval (CI) -0.13 to 0.39; 4 RCTs; n=1006; low CoE). They may improve physical outcomes (PedsQL; SMD 0.59, 95% CI -0.17 to 1.01; 1 RCT; n=95; low CoE; 18 mo FU), but show little to no difference in emotional functioning (multiple scales, SMD 0.09, 95% CI -0.07 to 0.24; 4 RCTs; n=693; low CoE; 12-18 mo FU)). Although little to no difference in self-reported PA (multiple scales, SMD 0.51, 95% CI -0.07 to 1.10; 4 RCTs; n=964; very low CoE), they may slightly improve QoL (multiple scales, SMD 0.13, 95% CI 0.02 to 0.24; 7 RCTs; n=1454; low CoE). We are very uncertain about intervention effects on AEs (1 RCT reported no AEs; n=46 very low CoE). They probably result in little to no difference in BMI z score at 12-18 (MD -0.11, 95% CI -0.19 to -0.02; 17 RCTs; n=2666 participants) and 24mths follow-up (both low CoE). No RCT reported on obesity-associated disability. Community-based HBLT showed more pronounced effects for physical health, but little to no difference in mental well-being at 12mths follow-up. We found comparable effects for PA and BMI z score, while effects for QoL were less pronounced.
Conclusions: Multimodal HBLT may improve certain patient-reported outcomes (e.g., physical well-being, QoL) and showed limited benefits on most, especially objective measured, outcomes. Future research should consider innovative approaches to the care of ALwO and involve diverse populations, as we found limited research conducted in disadvantaged and culturally/ethnically diverse populations and other low-resource settings.

PO3.160

Frequency of Bardet-Biedl syndrome variants in a population with early-onset obesity

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Introduction: The melanocortin-4 receptor (MC4R) pathway is critical for hunger regulation, energy balance, and weight regulation. In patients with Bardet–Biedl syndrome (BBS), a rare, genetically heterogeneous, and highly pleiotropic disease, the immotile primary cilia are dysfunctional, leading to an MC4R pathway impairment. Patients suffer from symptoms including early loss of vision, learning difficulties, and renal dysfunction, next to hyperphagia and early-onset obesity. The Rare Obesity Advanced Diagnosis (ROAD)™ genetic testing program aims to enhance access to genetic testing for European and Middle Eastern individuals with suspected rare MC4R pathway diseases. Here, we assessed BBS gene variant frequency using ROAD data.
Methods: Genes from individuals with early-onset obesity were sequenced. This analysis focuses on BBS genes (*BBS1-BBS22*). Variants were classified as pathogenic/likely pathogenic/variants of unknown significance (P/LP/VUS) according to American College of Medical Genetics criteria. The VUS category was further divided into suspected pathogenic (SP), uncertain, or suspected benign (SB) based on available evidence.
Results: Among 5,051 individuals, 7.1%, 24.6%, 28.4%, and 39.8% were aged <6, 6-<12, 12-<18, and ≥18 years at the time of testing, respectively, and the mean age (standard deviation, SD) of obesity onset was 8.0 (3.9) years. Overall, 16 individuals caried a P/LP biallelic variant and 72 a VUS biallelic variant, with variants in *BBS14* (n=22), *BBS20* (n=11) and *BBS9* (n=9) most frequently reported. In this cohort, for individuals <18 years mean BMI z-score was 3.8 (1.2) and for individuals ≥18 BMI was 41.6 (9.5) kg/m². Age of onset of obesity was 4.8 (3.7) years and of hyperphagia 3.1 (2.8) years. Individuals with P/LP/VUS variants in BBS genes were from Türkiye (n=38, 5.82% of tested individuals), Spain (n=20, 1.09%), Italy (n=14, 1.08%), UK (n=10, 2.25%), Israel (n=3, 0.60%), Ireland (n=2. 0.80%), and Germany (n=1, 1.32%). Of these patients, only 25 (28%) had a suspicion of BBS at the time of testing.
Conclusions: Among individuals tested, 1.74% with early-onset obesity caried a biallelic variant in 1 of 22 tested BBS genes, with a higher frequency of *BBS14* and *BBS20* variants versus literature, and a high frequency in Türkiye because of high consanguinity rates. At diagnosis, not all patients had a clear BBS phenotype. This indicates that all BBS genes should be included in panels testing for early-onset obesity, not just those investigating suspected syndromic disease, to help improve disease etiology understanding, and allow early diagnosis of patients who may benefit from novel treatments.

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PO3.161

Childhood Obesity Through a Clinical Lens: Exploring Causes, Challenges, and Consequences

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Childhood obesity leads to metabolic and systemic complications. While primary obesity is often lifestyle-related, secondary obesity, caused by genetic syndromes or hypothalamic tumors, poses unique challenges. This case series discusses three examples of childhood obesity, focusing on diverse causes, diagnostic difficulties, and associated complications.

CASE 1: Primary Obesity in a 12-Year-Old Boy

The patient comes from a disorganized family, with a mother living with severe obesity who abandoned the family and a father with type 2 diabetes who provides minimal supervision. Since age six, the patient experienced weight cycling. At presentation, his weight was 105 kg, with a BMI of 43.7 kg/m² (+2.8 SD). Complications included impaired glucose tolerance (OGTT-confirmed), insulin resistance (HOMA-IR=6), and metabolic dysfunction-associated liver disease (MASLD). The patient's history underlines the role of environmental and familial factors in the development of primary obesity. A multidisciplinary approach, including dietary interventions, physical activity, and psychosocial support, was recommended.

CASE 2: Prader-Willi Syndrome in a 6-Year-Old Girl

Genetic diagnosis was confirmed postnatally due to neonatal hypotonia, feeding difficulties, and distinctive facial features. Despite this, the parents resisted accepting the diagnosis and opposed treatment. The patient presented with severe obesity (BMI: 26.5 kg/m², +3.1 SD), type 2 diabetes (OGTT: 2-hour glucose=204 mg/dL), severe sleep apnea (AHI=18), and systolic hypertension above the 95th percentile. Initial management included dietary changes and Metformin, improving OGTT results, allowing Metformin discontinuation. However, growth hormone therapy could not be initiated due to obesity and sleep apnea. This case highlights the challenges in managing secondary obesity in genetic conditions, particularly when faced with family resistance.

CASE 3: Hypothalamic Obesity in a 9-Year-Old Girl with a Brain Tumor

A previously healthy girl experienced rapid weight gain (23 kg in 8 months), polydipsia-polyuria syndrome, and decreased visual acuity. MRI revealed bilateral optic nerve atrophy and a hypothalamic tumor, suspected to be a craniopharyngioma. Partial tumor resection confirmed the diagnosis of an optic chiasm germinoma. She began hormone replacement (hydrocortisone, levothyroxine, desmopressin) and later chemotherapy and radiotherapy. Despite appropriate weight management, she developed a cushingoid appearance six months into hydrocortisone replacement. She is now in remission with slight visual recovery and remains under multidisciplinary care.

Conclusion: This case series underscores the complexity of childhood obesity, its varied etiologies, and potential complications. While primary obesity is often driven by environmental and familial factors, secondary obesity related to genetic syndromes or tumors presents unique challenges.

Conflict of Interest: No conflict of interest to disclose.

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PO3.162

Development of a Large Language Model Chatbot to aid healthcare professionals in Childhood Obesity Management

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Introduction: Worldwide, the number of children with obesity is increasing at an alarming rate making childhood obesity a global health challenge [1]. To this end, BIO-STREAMS, an EU-funded project, delivers new evidence, methodologies and tools to support healthcare professionals (HCPs) in addressing this challenge in an effective and timely manner. This work proposes the development of a conversational agent (chatbot) to assist HCPs in the prevention, diagnosis and treatment of childhood obesity.

Background: National and international guidelines exist to guide HCPs on the management of childhood obesity; however, HCPs face severe time constraints and information overload in their clinical routine that can hinder their ability to access and apply these resources in their decision-making effectively. Recent developments in Artificial Intelligence (AI), namely Large Language Models (LLMs), offer promising ways for improving clinical decision-making. [2][3]

Methods: Leveraging the LLMs capacity to augment clinical expertise and streamline decision-making, we develop a conversational agent to provide HCPs evidence-based recommendations on the management of childhood obesity. A LLM is being fine-tuned using rigorously selected peer-reviewed scientific literature and guidelines on childhood obesity to transfer domain-specific knowledge to the model to enhance the model's ability to deliver precise, context-aware recommendations. Acknowledging that LLMs often 'hallucinate' false outputs and unsubstantiated answers [4], we implement a robust validation pipeline to ensure the reliability of the generated recommendations. To assess and compare the model's performance, we expose both chatbot and two groups of experts and junior HCPs to the same set of standardized multiple-choice questions designed to simulate real-world clinical scenarios.

Conclusion: In this work, we introduce a model that is designed to address the complexity of childhood obesity management and enhance clinical decision-making, improve access to evidence-based knowledge, and complement the expertise of healthcare professionals. This study represents a pivotal step toward integrating AI into clinical workflows for improved patient outcomes in childhood obesity care.

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PO3.163

Treatment of Obesity in Adolescents: A Significant Challenge

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Introduction: Obesity is a chronic disease that is difficult to manage, posing significant therapeutic challenges, especially in adolescents. Liraglutide, a GLP-1 receptor agonist, has demonstrated great potential as a pharmacological tool for weight control in this population. This study aimed to evaluate the impact of liraglutide treatment in adolescents with grade II and

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III obesity, analyzing its effects on weight, body mass index (BMI), body composition, and quality of life. Additionally, outcomes were explored in patients who complemented this treatment with bariatric surgery.
Methods: A prospective observational study was conducted in the clinical and surgical obesology service of an institution in Córdoba, Argentina, over six months. The study included 13 patients aged 13 to 19 years, diagnosed with grade II and III obesity, who received liraglutide in progressive doses (0.6 mg to 3 mg) administered subcutaneously. Additionally, some patients complemented their treatment with bariatric surgery, specifically gastric bypass (n=5) or sleeve gastrectomy (n=1).
Data were collected from electronic medical records, including weight, BMI, body composition (percentage of total body fat [TBF], visceral fat [VF], and muscle mass [MM]), adverse effects, and quality of life. All patients were evaluated and treated by a multidisciplinary team composed of clinical physicians, psychologists, nutritionists, kinesiologists, and surgeons. Data analysis included descriptive comparisons of variables before and after treatment.
Results: The patients had an initial average weight of 129 kg and a mean BMI of 45 kg/m². The average percentage of TBF was 35%, VF was 10%, and MM was 20%. After six months of liraglutide treatment, the average weight decreased to 117 kg and BMI to 39.44 kg/m². A significant reduction in TBF and VF was also observed, along with an increase in MM, associated with strength-based physical activity performed by the patients. Sixty percent of the patients (n=6) underwent bariatric surgery, with five undergoing gastric bypass and one sleeve gastrectomy. The pharmacological treatment was well-tolerated, with nausea being the only reported adverse effect. All patients showed an improvement in quality of life and self-esteem.
Conclusions: Obesity in adolescents is highly prevalent and associated with a greater risk of developing cardiometabolic diseases in adulthood. Early treatment, combining pharmacological strategies such as liraglutide and surgical approaches in selected cases, proved effective in reducing weight, BMI, and improving body composition. This comprehensive approach, supported by a multidisciplinary team, is essential to improve morbidity, mortality, and quality of life in adolescents with obesity.

Conflict of Interest: The authors declare no conflicts of interest.

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PO3.165

Intertwined pathways: Longitudinal evidence on weight status and mental well-being in children and adolescents

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Background: Obesity and poor mental well-being in childhood and adolescent are both growing public health concerns with potential implications for a broad range of life outcomes. It has been suggested that there is a bi-directional relationship between obesity and poor mental health, where psychological distress promotes unhealthy weight gain, and a high weight status further worsen mental health issues, making it increasingly difficult for affected children and adolescents to break out of this detrimental cycle. However, the majority of this research involve psychiatric diagnoses including depression and anxiety. Understanding the longitudinal and possible bidirectional relationship between weight status and mental well-being (defined as a non-clinical construct) is crucial for developing effective interventions to support children and adolescents.
Methods: This systematic review synthesizes evidence on the bidirectional relationship between weight status and indicators of mental well-being over time. Peer-reviewed studies were identified through searches in PubMed, PsycINFO, Scopus, and Web of Science. Eligible studies included longitudinal designs assessing weight status and mental well-being in populations up to age 18 years. Risk of bias was assessed using the Joanna Briggs Instrument, and findings were narratively summarized.
Results: The review included 33 longitudinal studies conducted between 1994-2022. Findings indicated a bidirectional association between weight and mental well-being, with stronger evidence supporting the impact of weight status on mental well-being than vice versa. There was a scarcity of longitudinal studies exploring the influence of mental well-being on subsequent weight status. Large heterogeneity in design and methods was found across included studies.
Discussion: The review underscores the importance of addressing both physical and psychosocial factors in weight- and mental well-being interventions targeting children and adolescents. Future research should prioritize longitudinal designs to better understand the influence of mental well-being on later weight development and explore underlying mechanisms.

PO3.166

Outcomes of GLP-1 usage in childhood obesity

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Introduction: Obesity in children is a growing concern with significant long-term health implications. Recent studies suggest potential benefits from The usage of GLP-1 RA, such as liraglutide, among pediatric populations.GLP-1 receptor agonists.
This study presents the outcomes, including efficacy and safety, of GLP-1 receptor agonist treatment in 10 pediatric cases diagnosed with obesity.
Case Series Overview:
Number of cases: 10
Age range: [12-18year old]
Realted Metabolic Outcomes: insulin resistance., dysglycemia, dyslipidemia
Methods: All patients received GLP-1 agonist therapy, liraglutide, following the typical dose adjusment regimen
Treatment duration ranged from 6 months to 2 years
Baseline assessments included anthropometric data (weight, height, BMI), metabolic markers (blood glucose, insulin resistance), and relevant comorbidities.
Follow-up assessments were conducted every to monitor weight loss, side effects, and other clinical parameters.
Outcomes:
Weight Loss:
Average weight reduction: 8-12% reduction in body weight
Average BMI reduction: 4-6 BMI points
Percentage of patients achieving clinically significant weight loss 8 out 10
Improvement in Metabolic Parameters:
Reduction in fasting glucose and insulin levels.
Improvement in insulin sensitivity as assessed by HOMA-IR.
Positive effects on lipids (cholesterol, triglycerides).
3. Comorbidity Resolution:
Improvement in quality of life as reported by patient and family assessments.
Postivie psychological outcomes: better self- confidence, social life and physical activity
4. Side Effects:
Common side effects included: nausea (3 patients), vomiting (1 patient), constipation (4 patients), injection site reaction (1 patient)
No severe adverse events were reported, but mild gastrointestinal symptoms were prevalent, which subsided after a few weeks of treatment.
Monitoring for potential thyroid or pancreatic concerns, with no significant findings in the cohort.
Adherence and Acceptability:
Overall adherence rate: 95%.
Patient and caregiver feedback indicated- overall satisfaction, some of the patients had some challenges with injection.
Psychological support was provided to manage patient expectations and address any emotional concerns related to body image and treatment.
Side effects were mild and transient in most cases, with no long-term adverse effects noted.

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There was a notable improvement in comorbidities such as insulin resistance and hypertension, which suggests a beneficial impact beyond just weight management.
Conclusion: GLP-1 receptor agonists demonstrated promising efficacy in promoting weight loss and improving metabolic outcomes in children with obesity.
Further studies with larger cohorts and longer follow-up are necessary to confirm these findings and refine treatment protocols.
Close monitoring for side effects, as well as psychological support, is essential in optimizing outcomes for pediatric patients.
Acknowledgements: Rayna Stoyanova, M.D, Kalina Topuzova M.D, Iliyana Kaleva M.D

PO3.167

Assessing eating behavior and hunger/satiety using a lab- ad libitum test meal in school-age children with obesity

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Introduction: Ad libitum meals are used to study eating behavior and metabolic responses. Participants eat based on their preferences and hunger/satiety cues. Literature is limited to a few studies on adults, and even fewer studies in children, with different body weight ranges and conditions.
Our study aims to assess eating behavior and hunger/satiety perceptions during a lab-ad libitum test meal in school-aged children as compared to those reported during the nutritional counseling
Methods: Ten fasting children (6-11 years, 70% males) with excess body weight were given a standardized breakfast (salty, sweet or mixed, based on children's preferences), tailored to LARN (Livelli di Assunzione di Riferimento di Nutrienti ed energia) recommendations, adjusted by age 75° percentile of total daily energy expenditure. An ad libitum lunch was served 3 hours later, to be consumed within 1 hour. Children were instructed to eat until their satisfaction. A dietitian observed eating behavior and time of consumption, in a neutral distraction condition with children grouped in pairs and parents waiting outside. Hunger/satiety were assessed using a 10-point faced Visual Analogue Scale (VAS), self-administered by children at five different time points, preceded by a short training to assess their awareness. Food was weighed before and at the end of the meal, to determine nutritional intake through food labels.
Results: 50% of children chose a mixed breakfast, 30% a sweet one and 20% chose the salty one. The average calorie intake during the ad libitum lunch was 1043.16 kcal (± 388.60), with macronutrients distributed as follows: 17.8% proteins, 47.65% fats, 33.54% carbohydrates. Children consumed the meal in about 33 minutes with an average intake of 31.6 kcal/minute. At the VAS scale, hunger decreased, and satiety increased significantly (p=0.074 and p=0.0009, respectively). All the participants reported a significant decrease in the additional amount of food they could consume afterward (p = 0.020), while no significant changes were observed in the desire to eat. Calorie intake, macronutrient distribution, and food preferences were aligned with diary reports.
Conclusion: The ad libitum meal proved effective in the clinical assessment of school-aged children's qualitative and quantitative eating habits and their ability to recognize hunger and satiety. Most of the children showed a preference for high-fat foods, deviating from the macronutrients distribution recommended by LARN. Intake and preferences during the test meal aligned with data reported on food diaries reproducing the dietary pattern described by parents and children. Meals were consumed at a moderate pace but the calorie intake per minute has to be taken into account as index of voracity.

PO3.168

Universal obesity school-based prevention program for Spanish adolescents: baseline situation

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Introduction: Childhood obesity is a public health concern due to its impact on physical and mental health. Three out of ten adolescents in Spain have excess weight. In the literature, interventions based on healthy habits and promoting emotional health have been described as an effective treatment for this disease. This group program aimed to prevent adolescent obesity through an intervention based on emotional regulation.
Methods: Eighty-eight adolescents aged 15-17 years (52 girls, 21% had overweight and obesity) from Gipuzkoa (Spain) participated in the intervention program. This cross-cohort study consisted of a 12-hour group intervention. The main elements of the program were emotional psychoeducation, physical sensations, healthy thinking, healthy behaviors, social skills training, and generalization of concepts. Body composition was assessed through body mass index. The Kidmed questionnaire evaluated adherence to the Mediterranean diet. The child and adolescent assessment system assessed behavioral and emotional regulation, and the adolescent silhouette test evaluated body image distortion and dissatisfaction.
Results: The baseline situation of the participants showed that 16% of the sample had a low adherence to the Mediterranean diet, 57% needed to improve their dietary pattern to adjust it to the Mediterranean model, and 27% had an optimal Mediterranean diet. Regarding the participants with excess weight, 61% showed poor or had to improved adherence to the Mediterranean diet.
Regarding emotional regulation, adolescents scored higher in internalized and externalized problems and lower in self-esteem and social skills. Likewise, girls scored higher in emotional and behavioral issues and lower in personal resources. Regarding differences according to BMI, differences were found in anger control problems between underweight and normal weight groups and underweight and overweight groups.
Data on body image showed that, in men, 71% presented body distortion and 68% body dissatisfaction. In women, 2% were at risk of eating disorders, 73% had body distortion, and 71% had body dissatisfaction. Of the participants with excess weight, 78% of the males presented body distortion and body dissatisfaction, and 89%of the females presented body distortion and 100% body dissatisfaction.
Conclusion: These results suggest that the adolescents presented an improvable eating pattern, as well as difficulties in emotional regulation and body image. This data can be used to monitor adolescents' challenges and physiological and psychological evolution during their development.

PO3.169

The Silent Threat: How Childhood Obesity and Insulin Resistance Shape Arterial Health

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Introduction: Insulin resistance associated with childhood obesity is a significant risk factor for the development of type 2 diabetes and cardiovascular damage. Early detection of complications is essential to reduce

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their impact. Monitoring vascular biomarkers of arterial stiffness is useful for long-term risk assessment. This study aims to explore the correlation between insulin resistance and arterial stiffness in children living with obesity.
Methods: The study included 100 children aged 6–18 years: 70 children with obesity and 30 with normal weight. Clinical parameters assessed included BMI, waist circumference (WC), waist-to-height ratio (WHR), the presence of acanthosis nigricans, and irregular menstrual cycles, in adolescent girls. Arterial stiffness parameters—pulse wave velocity (PWV), augmentation index (AIx), and peripheral and central blood pressures (SBP, DBP, cSBP, cDBP)—were evaluated using a Mobil-O-Graph device (brachial measurement). Blood tests included HOMA-IR, lipid profile, uric acid, transaminases, and 25-OH vitamin D levels.
Results: HOMA-IR showed a positive correlation with the clinical parameters. For vascular parameters, the correlation was significant in prepubertal and postpubertal children but not in pubertal children. HOMA-IR was an independent predictor for PWV, AIx, and both peripheral and central blood pressures. Acanthosis nigricans was present in 55% of children with obesity, and AUC-ROC analysis identified cut-off values for PWV (>4.9 m/s), SBP (>124 mmHg), and cSBP (>118 mmHg) to predict its presence. Obese girls with irregular menstrual cycles had higher HOMA-IR, PWV, SBP, and DBP values. Elevated levels of uric acid, LDL-c, non-HDL-c, triglycerides, and transaminases, along with decreased HDL-c and 25-OH vitamin D levels, were correlated with increased PWV and peripheral and central blood pressures.
Conclusions: In children with obesity, insulin resistance exacerbates arterial stiffness. HOMA-IR is an independent predictor of all vascular biomarkers analyzed. HOMA-IR is not a sufficiently accurate marker during puberty. Acanthosis nigricans is a significant marker of insulin resistance, highlighting the need for more comprehensive vascular health investigations in affected children.

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PO3.170

The Early Burden of Childhood Obesity: Exploring Arterial Stiffness, Subclinical Atherosclerosis, and Preventable Risk Factors

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Introduction: Children living with obesity face a higher cardiometabolic risk, with longer durations of obesity linked to earlier and more severe vascular damage. Non-invasive vascular biomarkers that assess arterial stiffness and subclinical atherosclerosis can provide valuable insights into disease progression. Identifying modifiable risk factors is critical to reducing long-term cardiovascular risk.
Methods: This study included 120 children aged 6–18 years, divided into 70 children living with obesity and 50 with normal weight. Secondary obesity and acute inflammation were excluded. Clinical assessments included BMI, waist circumference, waist-to-height ratio, Tanner stage, presence of acanthosis nigricans, and irregular menstrual cycles, in adolescent girls. Vascular biomarkers—carotid intima-media thickness (CIMT), pulse wave velocity (PWV), peripheral and central blood pressures—were measured using non-invasive devices. Blood tests included HOMA-IR, lipid profile, uric acid, and 25-OH vitamin D. Risk factors such as maternal weight gain during pregnancy, postnatal nutrition, family history of obesity, sedentariness, smoking exposure, and sleep deprivation were analyzed.
Results: Children living with obesity showed significantly higher vascular biomarker values than controls. PWV and central SBP cut-offs were defined for detecting obesity across age groups. Waist circumference and waist-to-height ratio strongly correlated with all vascular parameters. HOMA-IR independently predicted most vascular biomarkers. Irregular menses in girls were associated with elevated PWV and BP. Elevated uric acid, LDL-c, triglycerides, and transaminases, alongside low HDL-c and 25-OH vitamin D, correlated with arterial stiffness and CIMT. Risk factors such as maternal weight gain (>20 kg), smoking exposure, sedentariness, and sleep deprivation were linked to worse vascular outcomes.
Conclusions: Childhood obesity promotes early arterial stiffness and subclinical atherosclerosis, increasing cardiovascular risks into adulthood. Waist circumference and waist-to-height ratio are critical clinical markers of vascular health. Insulin resistance exacerbates arterial damage, necessitating further evaluation of vascular health in these patients. Addressing risk factors like maternal obesity, passive smoking, and sleep deprivation can slow disease progression and improve long-term outcomes.

Conflict of Interest: No conflict of interest to disclose.

Funding: No funding to disclose.

PO3.171

Voices for the future: what children's preferences, perceptions, knowledge, tell us about the food environment, food choices and the way forward?

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Introduction: Childhood and adolescence are key periods of body development and a foundation of eating behaviours. Grasping children's eating patterns and food environment from their own perspectives is essential to better understanding circumstances related to (familiar) food choices and to shape food literacy competencies forward healthy and sustainable dietary behaviors through life.
Methods: A cross-sectional study using visual methods and game-based in-depth interviews was conducted with thirty-four children aged 6-7 years. Three questions were documented in drawings: "What is your favourite food?", "What makes you grow strong and healthy?" and "What do you enjoy doing the most?". A memory game composed of wooden pieces with food subjects - open/closed fruits, vegetables, and a miscellaneous of food items including processed food - was played with a group of 2-3 children during the in-depth interview. Interviews were transcribed verbatim and analysed together with the drawings; a coding scheme reported the competences related to food. This work was conducted between January and February 2024 and is an integral part of the 2-year PAS GRAS study 'Gymnastic against Obesity' (713/2023).
Results: Food recognition and categorization was made with great ease, especially in fruits and ultra-processed food categories; some vegetables, legumes and nuts were less known. Regardless of the children's favorite food, where ultra-processed items were frequently mentioned, their knowledge about (un)healthy food and the importance of food and nutrition, eating healthy and sustainable foods was unanimous. Food diversity, as the case of types of meat and fish and some cereals, fruits, vegetables, legumes and tubercles was also addressed, the latter mostly associated with diversity due to color differences. Several children associated the fruits with the seasons but not all were familiar with it. Interestingly, households

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that grow fruit and vegetables, with great emphasis on the grandparents, and green spaces in the neighbourhood highlight the connection between food and nature. Despite the large range of mentioned skills, food preparation, cooking with family, and pleasure from eating shared meals, was always reported with enthusiasm. Playing was the preferred activity chosen, often associated with an exercise component, while screen use was rarely mentioned.
Conclusion: The present participatory approach with drawings and in-depth interviews playing the game allowed us to characterize competences related to food (relational, functional and critical) offering valuable insights about how the food-related knowledge, perceptions, and behaviors, and its relationships with the food environment. Such insights contribute to mapping environmental determinants of health from the children's perspectives but also a way forward to guide integrated healthy and sustainable food programs aligned with the children's voices in the prevention and treatment of children living with overweight and obesity.

Conflict of Interest: None Disclosed

Funding: This research is related to the PAS GRAS project funded by the European Union, under the grant agreement No 101080329.

PO3.172

Validity of Several Equations for Predicting Resting Energy Expenditure in Pediatric Patients with Crohn's disease

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Introduction: Nutritional therapy is a fundamental part of the treatment for pediatric patients with Crohn's disease. Consequently, pediatricians commonly prescribe specific diets to these patients. To do so, clinicians need to estimate the patients' energy needs, which is typically done using equations to predict resting energy expenditure (REE). However, these equations were developed using data from healthy individuals and may not accurately predict the REE of pediatric patients with Crohn's disease. This study aims to investigate the validity of the REE-predicting equations proposed by the WHO, Harris and Benedict, and Schofield.
Methods: Twenty-five pediatric patients (14 females, 11 males; age: 14.4±2.2 years; body mass index: 19.7±3.8 kg/m²) with Crohn's disease participated in this ongoing observational study. The participants' REE was measured using indirect calorimetry (Omnical, Maastricht Instruments Inc., The Netherlands). Measurements were performed early in the morning after an overnight fast, with participants lying quietly in a reclined bed. Following a minimum of 15 minutes of rest, a 30-minute measurement was conducted. Participants' anthropometric data were collected using standard methods and used to estimate their REE with equations proposed by the WHO, Harris and Benedict, and Schofield. The Schofield equation was applied both with and without incorporating height. Estimated REE values were compared with measured REE using paired t-tests and Bland-Altman plots.
Results: All REE-predicting equations, except Harris and Benedict, overestimated the participants' measured REE (measured REE: 1421±214 kcal/day; WHO: 1482±233 kcal/day, P=0.075; Schofield: 1491±235 kcal/day, P=0.038; Schofield without height: 1494±242 kcal/day, P=0.039; Harris and Benedict: 1447±208 kcal/day, P=0.421). Furthermore, the Harris and Benedict equation showed the narrowest range of 95% confidence limits of agreement (618 kcal/day compared to 641 kcal/day for the WHO equation, 624 kcal/day for the Schofield equation, and 657 kcal/day for the Schofield equation without height).
Conclusions: Preliminary findings suggest that the Harris and Benedict equation is the most valid approach for estimating the REE of pediatric patients with Crohn's disease.

Conflict of Interest: None Disclosed

Funding: The study was supported by an equipment loan from Maastricht Instrument Inc.

PO3.173

The microbiota of children with obesity is associated with carbohydrates and insulin resistance

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Introduction: Among diet, microbiota, and obesity exists a close correlation that remains insufficiently explored, particularly within the pediatric age. We aimed to investigate the relationship between dietary composition and microbiome in pediatrics subjects with obesity in depth before conducting educational training in a Mediterranean-style diet.
Methods: 55 subjects (10-18 years) with overweight or obesity and visceral adiposity, diet naïve, or failure to a previous weight loss program were phenotypically described through clinical and metabolic parameters, including circulating LPS levels. 16S DNA sequencing was used to profile the microbiota. Lifestyle habits (KIDMED score, 24-hour recall, International Physical Activity Questionnaire for Adolescents) and diet composition were assessed.
Results: Five different main enterotypes were found. Females at the end of puberty were well separated from the other subjects at the PCA. Also, LPS levels negatively correlated with Tanner stages. Gut microbiota composition considering all the clinical parameters was significantly modulated mostly by the percentage of carbohydrates (CHO) intake and indexes of insulin resistance, (HOMA-IR ≥ 95° percentile). CHO intake ranging from 45-55% determined a high number of species but with a reduction of biodiversity (Shannon and Simpson indexes). *B. dorei*, *Turicibacter sanguinis*, and *B. vulgatus* were among the main species involved in signatures of CHO intake, whereas an enrichment in *Bacteroides stercoris* was found in subjects with a low fiber intake. Adherence to the Mediterranean diet was associated with a great presence of dietary fiber metabolizers and SCFA producers, including *Faecalibacterium prausnitzii* and *Lachnospira* sp. *Alistipes finegoldii* and *Akkermansia muciniphila* were more represented in low insulin resistance, while *Bifidobacterium pseudocatenulatum* and *Clostridium clostridioforme* were enriched in patients with high insulin resistance.
Conclusion: CHO content of the diet, insulin resistance, and microbiome are strictly related in children with obesity. A certain degree of dysbiosis could link obesity to a severe phenotype. Since gender and puberty status impact on the microbiota signature, clustering pediatric patients to diet intervention is a challenge.

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PO4 - OBESITY MANAGEMENT and INTERVENTION

PO4.001

Comprehensive Correlation and Predictive Analysis of TMAO and Resistin as Biomarkers of Cardiometabolic Risk Factors: Development of Significant Independent Predictors and Evaluation of Cardiometabolic Risk

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Introduction: Obesity in adults is associated with an elevated cardiometabolic risk, manifesting as subclinical atherosclerosis and early onset of insulin resistance. This study aimss to develop a predictive model for cardiometabolic risk by simultaneously assessing the relationship between biomarkers, including resistin and trimethylamine N-oxide (TMAO), and carotid intima-media thickness (CIMT), within the context of routine clinical evaluations in overweight individuals.

Methods: The study enrolled 60 adults (ages 18-71) of varying nutritional profiles, from normal weight to obesity. Medical history, including familial and personal cardiometabolic diseases and lifestyle factors, was recorded. Clinical assessments measured BMI, waist-to-hip ratio (WHR), and waist circumference (WC), with body composition analyzed using the TANITA BC-418. Carotid intima-media thickness (CIMT) was assessed via the Aixplorer MACH 30 ultrasound system. Blood biomarker analysis included TMAO and resistin, along with other metabolic function tests conducted within three months prior to the study.

Results: The study examined health variables across five BMI categories, showing significant increases in TMAO, resistin, CIMT, fat mass, fasting blood glucose, HbA1c, and lipid profiles as BMI increased ($p<0.001$), reflecting worsened metabolic and cardiovascular health. Muscle mass and body water declined, while Resting Basal Metabolism and liver enzymes (AST, ALT) rose ($p<0.001$), with vitamin D levels decreasing ($p<0.001$). Thyroid function, triglycerides, and uric acid remained stable across BMI groups ($p>0.05$). Significant associations were found between TMAO, resistin, and factors like family medical history, physical activity, and vascular impairment. Family history of obesity, diabetes, and cardiovascular disease significantly correlated with higher TMAO levels ($p=0.03$, $p=0.01$, $p=0.02$), while resistin was higher with a family history of diabetes ($p=0.04$) and shorter sleep ($p=0.04$). Both biomarkers were elevated in less active participants ($p=0.001$ for TMAO, $p=0.02$ for resistin), and TMAO was linked to vascular impairment ($p<0.001$). TMAO also showed strong correlations with CIMT ($\rho=0.674$ and $\rho=0.680$), indicating its role in atherosclerosis risk. Logistic regression identified total cholesterol, FT4, and AST as predictors of high cardiometabolic risk using a TMAO threshold of 380 (Nagelkerke $R^2=0.475$). ROC analysis showed excellent model discrimination (AUC=0.880), with sensitivity of 71.4%, specificity of 97.8%, and 91.7% accuracy ($p<0.001$). Multiple linear regression explained 44.3% of the variance in resistin levels, with age negatively associated (estimate=-0.08, $p<0.001$) and CIMT, WHR, and total cholesterol positively linked. LDLc had a significant inverse relationship with resistin (estimate=-0.06, $p=0.003$).

Conclusion: This study emphasizes the role of TMAO in linking elevated BMI with metabolic and cardiovascular dysfunctions, showing strong associations with central adiposity and atherosclerosis, particularly through CIMT correlations. Both TMAO and resistin provide key insights into the metabolic and cardiovascular risks associated with obesity.

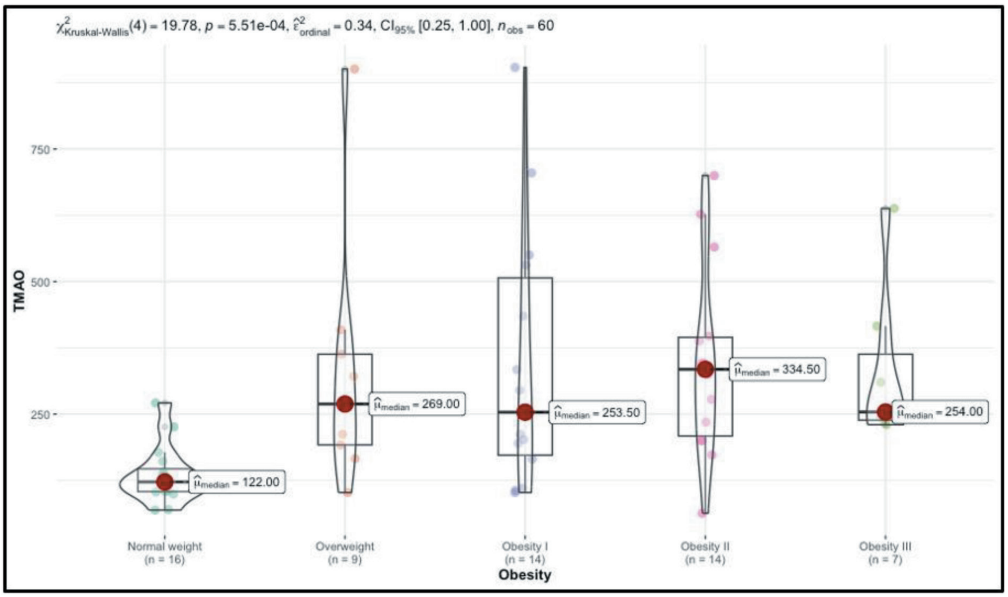


Fig. 1. Distribution of TMAO Levels Across Different BMI Categories.

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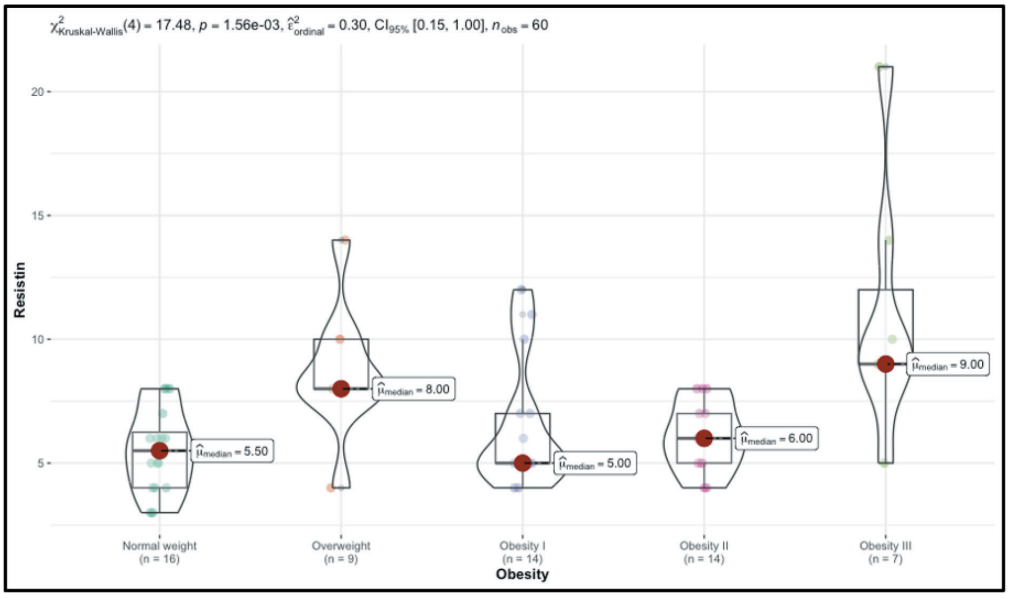


Fig. 2. Distribution of Resistin Levels Across Different BMI Categories.

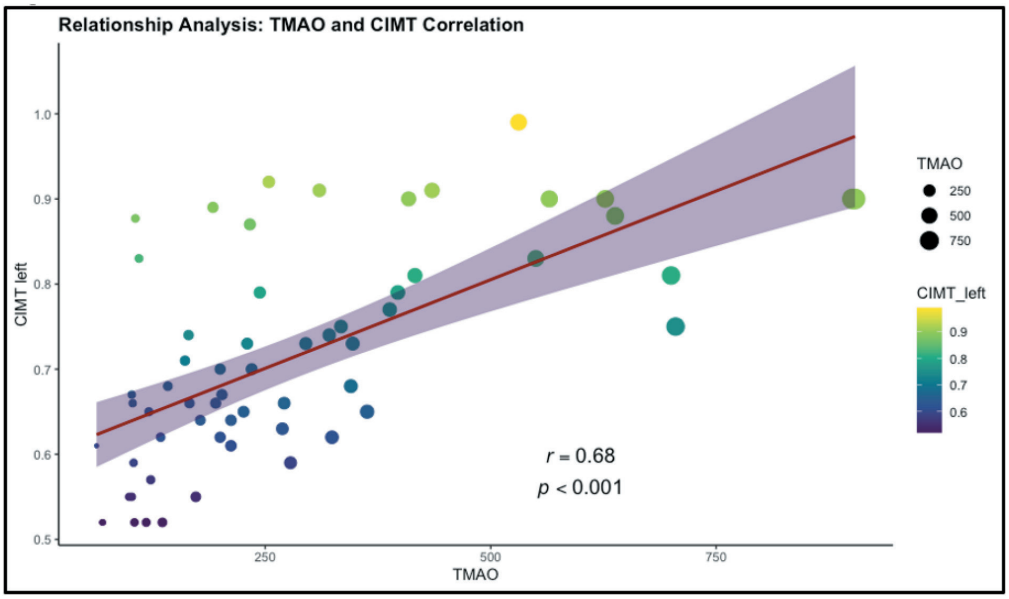


Fig. 3. Correlation Between TMAO Levels and Left Carotid Intima-Media Thickness (CIMT).

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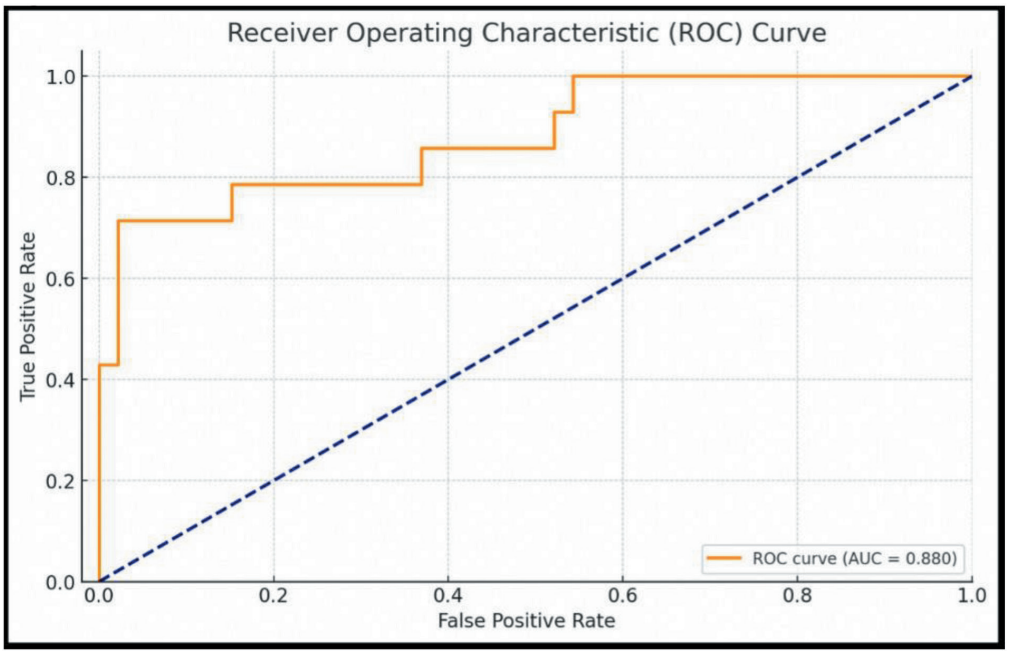


Fig. 4. ROC Curve for TMAO-Based Cardiometabolic Risk Prediction Model.

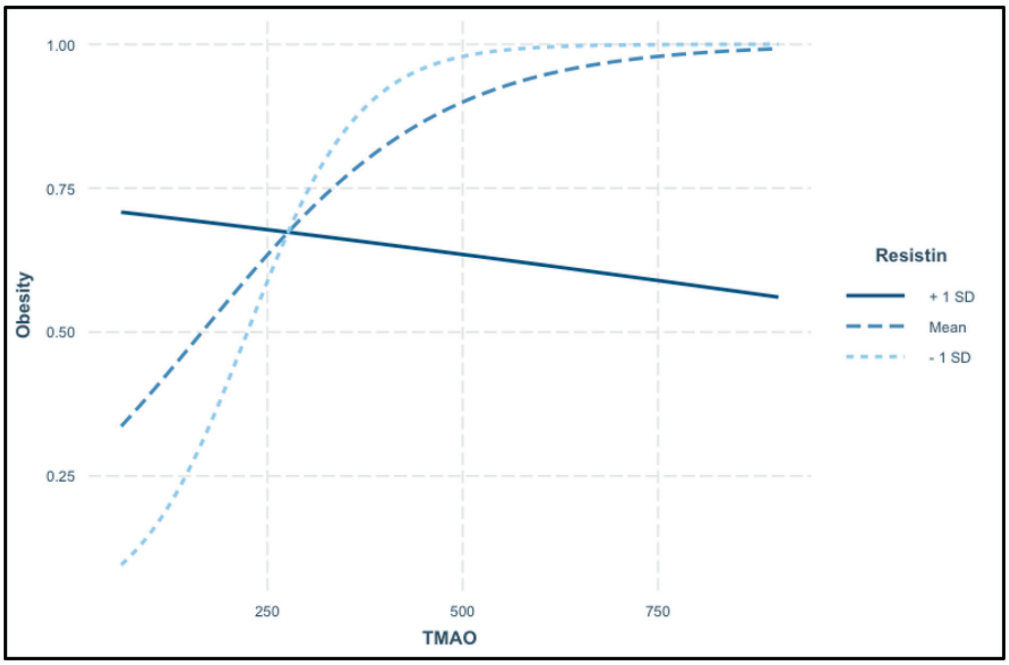


Fig. 5. Interaction of TMAO and Resistin in Predicting Obesity.

Tab. 1.

Predictors	Odds Ratios	CI	p-valuea
Total Cholesterol	1.03	1.01-1.05	0.015
FT4	0.72	0.52-0.95	0.029
AST	1.10	1.03-1.20	0.010
R2 Nagelkerke	0.475		

Assessing cardiometabolic risk using TMAO. Abbreviations: TMAO -Trimethylamine N-oxide, FT4 - Free Thyroxine (Free T4), AST - Aspartate Aminotransferase, CI - 95% Confidence Interval, p-value - Wald's test result.

Tab. 2.

Predictors	Odds Ratios	CI	p-value
TMAO	1.02	1.01-1.04	0.003
Resistin	1.93	1.19-3.39	0.012
TMAOX Resistin	1.00	1.00-1.00	0.010
R2 Nagelkerke	0.321		

Interaction between TMAO and resistin for predicting obesity risk

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PO4.002

Bariatric Arterial Embolization vs Bariatric Surgery: Comparison of metabolic effects in obese patients with Type2 Diabetes

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Background and Aims: Global diabetes incidence has reached 9.3%, with over half (50.1%) of adults undiagnosed, with type 2 diabetes (T2D) accounting for about 90% of all people with diabetes (1,2). Obesity is the main risk factor for T2D, due to its relationship with insulin resistance and chronic systemic inflammatory process, leading in turn to altered glucose homeostasis. The relationship between obesity and T2D is so strong that weight loss directly impacts the improvement of glycemic control of these patients achieved with clinical and/or nutritional approaches (2). Our aim is to evaluate the long-term metabolic control, remission of T2D and weight loss after bariatric arterial embolization (BAE) in comparison with bariatric surgery (RYGB).

Materials-Methods: On this prospective, randomised, non-blinded, controlled and interventional clinical single-centre study, we compared the impact of RYGB and BAE on metabolic control in patients with T2D and Obesity (BMI between 30-43 Kg/m2) over 1 year. The study was approved by the Ethics Committee (NR 012/20 and 92/2020/CEFCM) and performed in accordance with the Helsinki Declaration. Seven participants aged 53–74 ± 7 years with mean BMI of 31.7- 47.3 ± 6.7 and 17 participants aged 21–72 ± 14 years with mean BMI of 31.8- 47.9 ± 4.7 were enrolled for the BAE approach and RYGB, respectively. BAE was performed by transarterial embolization of the left gastric artery using 300- to 500-µm embolic microspheres (embospheres). The RYGB was performed according to established surgical procedures. Participants were evaluated at baseline, 1,3,6 and 12 months after BAE and RYGB surgery. Primary endpoints were 30-day levels of body weight and glycemic control parameters. Secondary end points at up to 12 months included technical feasibility, impact of weight and the success rate of biochemical resolution of T2D. At each visit blood samples were collected, and analysis of BMI, weight and waist circumference were made. Statistical analysis of percentage of change of each parameter was performed by student t-test or One-Way ANOVA.

Results: BAE and RYGB surgery were performed successfully for all participants with no major adverse events or procedure complications (Clavien Dindo Classification). Body weight loss was significantly higher with RYGB surgery at 3 months (BAE= 9.7% and RYGB= 24.1%, $p<0.01$). Regarding the T2D remission, most patients stopped their diabetes medication after 30 days of BAE with no differences to RYGB. Glycemia, triglycerides (TGs) and GGT plasma levels decreased significantly more with BAE approach in comparison to RYGB surgery (% of change: Glycemia= 30.1 and 14.7, $p<0.01$; TGs= 72.5 and 21.2, $p<0.05$; GGT= 3.3 and -1.0, for BAE and RYGB, respectively).

Conclusion: Despite RYGB having a higher beneficial impact of body weight control, BAE showed to have a higher impact in metabolic control at 3 months post-intervention. We can conclude that BAE can be a better alternative for metabolic control in patients without indications for the invasive surgical approach of RYGB.



embosphere particles 300- 500 microns were selected for the study.

Fig. 1. Embosphere particles.



Embolisation start site in the left gastric artery trunk

Fig. 2. Left gastric artery trunk.

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PO4.003

Impact of multifactorial lifestyle interventions on psychosocial well-being in children living with obesity

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Introduction: Children with obesity are at greater risk of impaired psychosocial well-being, yet limited knowledge exists regarding the long-term effects of lifestyle interventions on psychosocial well-being. This study examines the long-term impact of a one-year and three-year family-centered lifestyle intervention on psychosocial well-being in children with obesity.
Methods: The study included 319 children aged 5 to 10 years with obesity (BMI ≥ 30 kg/m², adjusted for age and sex) who participated in either a one-year (n=107), a three-year (n=66), or no intervention (n=146). The mean follow-up period was 23.7 ± 4.2 months. Psychosocial well-being was assessed using the Danish National Well-being Questionnaire and analyzed using multivariable logistic regression.
Results: The three-year intervention group showed a significant decrease in loneliness (aOR: 2.02 CI: 1.00, 4.13) and bullying (aOR: 2.75 CI: 1.31, 5.77) compared to the one-year intervention group. However, it did not show significant long-term effects compared to the non-intervention group. Conversely, the one-year intervention group showed increased loneliness (aOR: 0.55 CI: 0.31, 0.97) and bullying (aOR: 0.43 CI: 0.24, 0.76) compared to the non-intervention group.
Conclusion: The longer and more flexible three-year lifestyle intervention proved more effective than the one-year intervention in improving long-term psychosocial well-being in children with obesity.

PO4.004

Real-world evaluation of weekly Semaglutide 2.4mg (Wegovy™) in adults with complex obesity: insights from phase 1 implementation in a UK National Health Service (NHS) inner city obesity service

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Introduction: Semaglutide (Wegovy™), a glucagon-like peptide-1 receptor agonist, is recommended by the National Institute for Health and Care Excellence (NICE) for adults with a Body Mass Index (BMI) of ≥35 kg/m² with obesity-related comorbidities. However, uptake within the NHS has been challenging due to funding and capacity constraints. In our specialist weight management service, we prioritised urgent cases during the phased rollout of semaglutide.
Aim: This service evaluation aimed to evaluate clinical outcomes during the initial adoption of semaglutide.
Methods: We conducted an analysis of patients commenced on subcutaneous weekly injectable semaglutide 2.4 mg over 6 months (May to Dec 2024). The patients were prospectively identified during their initial assessment in Obesity Clinic and their electronic health record were reviewed to complete demographics, clinical history (co-morbidities, medications), dietary/ lifestyle history, psychological assessment, measurements (weight, height, blood pressure) and laboratory measurements (lipids, HbA1c). The clinical pathway involves 3-monthly visits over 2 years and multidisciplinary visits including medical, dietetic, pharmacist and psychological support where necessary.
Results: In Phase 1, 129 patients were initiated on weekly injections of semaglutide for obesity, prioritised due to the requirement of preoperative weight reduction to enable surgery, e.g. organ transplant (n=47), presence of severe obstructive sleep apnoea/ obesity hypoventilation syndrome (n=41), idiopathic intracranial hypertension (n=13), weight loss to facilitate cancer-related treatment (n=7) or other reasons (n=21).The mean (SD) age of the patients was 48 (13) years, majority being female (n=103, 80%) and 44% of the patients were from a white ethnic background. At baseline, mean BMI was 49.9 (11.2) kg/m², mean weight was 138.3 (30.2) kg, and mean HbA1c was 42.5 (7.10) mmol/mol, 6.1% (0.65). The cohort exhibited numerous obesity-related comorbidities, including hypertension (n=66, 51%), type 2 diabetes mellitus (n=38, 30%) hyperlipidaemia (n=44, 34%), and mental health disorders (n=52, 40%). At 12 weeks, compared to baseline, mean change in body weight was -7.7 ± 4.4 kg ($p < 0.0001$; 95% CI: -8.8 to -6.5), with an average percentage body weight loss of -5.65%. Categorical outcomes indicated that 50% of patients achieved clinically significant weight loss (≥5%). For those treated for 26 weeks (n = 26), the mean body weight reduction was -11.1 ± 4.7 kg ($p < 0.0001$; 95% CI: -13.0 to -9.2), -8.6% reduction in body weight, with 80.8% reaching clinically significant weight loss of (≥5%). Despite mild adverse effects, notably gastrointestinal, the retention rates remained significantly elevated at 94%.
Conclusion: A tailored, multidisciplinary Phase 1 optimisation pathway has significantly enhanced weight loss. Further studies are warranted to evaluate weight reduction and other health benefits.

PO4.005

GLP-1 receptor agonists and risk of bone fractures in elderly people with type 2 diabetes

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Objective: To assess the risk of fractures associated with glucagon-like peptide 1 receptor agonists (GLP1-RAs) therapy compared to sodium-glucose cotransporter-2 inhibitors (SGLT-2i) and dipeptidyl peptidase-4 inhibitors (DPP-4i) therapy in elderly people with type 2 diabetes.
Methods: A nationwide, population-based cohort study included individuals with type 2 diabetes aged 65 years or older, who initiated GLP-1RA therapy or one of the comparators in January 2018- October 2022. The primary outcome was the first incident of bone fracture, either vertebral, hip, pelvic, humerus, forearm or rib fractures. Patients anthropometric and clinical characteristics, including osteoporosis and risk factors for fractures, were extracted from the electronic database. People were followed until the earliest of fracture, death, or March 2024. After adjustment for propensity score, hazard ratios (HRs) with 95% CIs were estimated using stepwise Cox models, and Fine Grey model for competing risks. Subgroup analyses by age, sex, ethnicity, BMI, and osteoporosis were also performed.

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Results: In a cohort of 45,222 people with a median follow up of 35.3 (IQR 24.7-48.0) months, 3,618 (8.0%) had an incident fracture. Among 11,061 and 34,161 new users of GLP-1RAs and the active comparator drugs, the overall incidence of fractures was comparable between the two group, 2.82 (95%CI 2.63-3.02) vs. 2.75 (95% CI 2.65-2.85), p=0.53, per 100 person years, respectively. In multivariate analysis, adjusted for propensity score and multiple risk factors for osteoporotic fractures, initiating GLP-1RAs was associated with a 12% increased risk for bone fractures compared to the control group (HR 1.12, 95%CI 1.03-1.23, p=0.006). Repeating the analysis for competing risks, along with conducting various subgroup and sensitivity analyses, yielded results consistent with those of the main analysis.
Conclusions and Relevance: Initiation of GLP-1RA therapy was associated with an increased risk of incident fractures compared to DPP4i and SGLT2i among elderly individuals with type 2 diabetes.

PO4.006

Service evaluation of real-world data of a medication-assisted digital clinical programme, Roczen Plus, on outcomes in self-paying patients living with obesity in the UK

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Introduction: Obesity is a global public health issue, with 64% of adults living with overweight or obesity in the UK. Digital interventions have gained momentum due to their scalability, ease of access and mounting operational pressures on the NHS. Roczen is a digital, clinical programme designed for people living with obesity. It is recommended in guidance by the National Institute of Health and Care Excellence for digital weight management inclusive of pharmacotherapy in the NHS. The aim was to examine the impact of Roczen's medication-assisted doctor-led pathway in a cohort of patients who self-funded the programme, using real world data.
Method: We conducted a retrospective, real-world service evaluation of a self-pay cohort. Patients were initiated on a glucagon-like peptide-1 (GLP-1) or GLP-1/glucose-dependent insulinotropic polypeptide receptor agonist by a doctor in addition to dietary and physical activity guidance, via the Roczen App. The programme was digitally-delivered with regular video consultations to follow up, goal setting, self-monitoring, motivational interviewing, feedback, and peer support. Patients were able to track biometrics and other data within the App. These data were visible to Roczen clinicians who remotely monitored the patient's outcomes in order to track progress, ensure patient safety and conduct pharmacovigilance. Advice was individually tailored and based on patient preference. We calculated mean±standard deviation to compare biometric outcomes.
Results: We included 76 patients (53.7±11.7 years, 69.7% female, BMI: 35.3±5.3kg/m2, 78.9% were from white ethnicity) who were at varying stages of the programme (mean time on programme 31.0±26.9 weeks). At baseline, mean waist circumference was 110.4±15.0cm (n=69), mean systolic blood pressure (SBP) was 132±13.0mmHg, mean diastolic blood pressure (DBP) was 81±8.4mmHg (n=62) and the number of obesity-related co-morbidities was 1. (n=60). Of data available, mean weight loss was 9.6±7.3kg (-9.5%) at 3months (m) (n=52, p=0.003) and at 6m, mean weight reduction was 14.5±7.4kg (-14.9%, n=38, p<0.001). At 6m, ≥5%, ≥10%, ≥15% and ≥20% body weight loss was achieved by 89.5%, 71.1%, 55.3% and 25.7% respectively. Waist circumference, mean reduction was 10.3±7.2cm (9.1%) at 3m (n=35, p=0.01) and 14.6±4.4cm (13%, n=24, p<0.001) at 6m, respectively. SBP and DBP reduced by 11.8±14mmHg (n=28, p=0.009) and 6.4±8.4mmHg (n=28, p=0.006), respectively, at 3m. Retention rates at 3m and 6m were 82% and 64%, respectively.
Conclusions: Evaluation of the Roczen Plus programme within a real-world setting shows that patients achieve clinically significant outcomes over 6m with over a quarter of patients achieving ≥20% weight loss. High retention rates further support the feasibility and acceptability of this digitally-delivered pathway.

PO4.007

Pharmacogenomic analysis of the GLP-1 receptor in a phase 2 trial of survodutide, a glucagon/GLP-1 receptor dual agonist, in adults with obesity

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Introduction: Obesity presents a global health challenge, and there is a continuing need for effective obesity medications. Survodutide is a glucagon/glucagon-like peptide-1 (GLP-1) receptor (R) dual agonist in clinical development for the treatment of obesity, and metabolic dysfunction-associated steatohepatitis. Data from a phase 2 clinical trial in adults with obesity without diabetes (NCT04667377) were published.[1] Studies have shown that genetic variants, such as single nucleotide polymorphisms (SNPs), may influence inter-individual therapeutic responses to GLP-1R agonists.[2] We present data from a prespecified pharmacogenomic analysis of GLP-1R variants in the phase 2 trial population to investigate their possible effect on therapeutic responses to survodutide.
Methods: 387 adults (≥18 to <75 years) with BMI ≥27 kg/m² without diabetes were randomized to once-weekly subcutaneous survodutide (0.6, 2.4, 3.6, or 4.8 mg) or placebo for 46 wk, comprising an initial rapid dose-escalation period of up to 20 wk (option to adjust dose for gastrointestinal tolerability), followed by dose-maintenance for the remaining trial duration. Blood samples were obtained from trial participants at visit 2, prior to start of study treatment. Following DNA extraction (Chemagic DNA Blood 400 Kit special, Perkin Elmer), 5 ng of DNA was used for genotyping the 3 most common GLP-1R SNPs; rs6923761, rs10305420, and rs2268640 (TaqMan, ThermoFisher/Applied Biosystem). Mixed models for repeated measurements (MMRM) were fitted to data of six endpoints to test treatment effect heterogeneity after 46 weeks across genotypes of each of the selected SNPs. Treatment group referred to actual dose and only on-treatment data were analyzed. P-values from F-tests of heterogeneity at week 46 across genotypes and across all treatment comparisons (survodutide actual dose vs placebo) were considered nominally significant at the 5% level.
Results: Whole blood samples were available from 344 trial participants; of these, 337 samples were available for analysis following DNA extraction and quality checks. Genotyping analysis of GLP-1R SNPs revealed there was no statistically significant treatment effect heterogeneity between these genetic variants and the observed changes in bodyweight (rs6923761 p=0.44; rs10305420 p=0.69; rs2268640 p=0.48) (Figure), waist circumference (rs6923761 p=0.89; rs10305420 p=0.38; rs2268640 p=0.44), and selected protein biomarkers; blood HbA1c (rs6923761 p=0.94; rs10305420 p=0.38; rs2268640 p=0.61); fasting plasma glucagon (rs6923761 p=0.85; rs10305420 p=0.95; rs2268640 p=0.40), and fasting plasma glucose (rs6923761 p=0.82; rs10305420 p=0.63; rs2268640 p=0.19); and fasting serum insulin (rs6923761 p=0.32; rs10305420 p=0.97; rs2268640 p=0.55).
Conclusion: The GLP-1R variants investigated here were not associated with changes in survodutide efficacy in this phase 2 trial population.

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Forest plot summary of subgroup MMRM analysis for percentage change from baseline in bodyweight (%) at week 46 by genotype – gene variant rs6923761 (FAS; actual treatment; on-treatment)

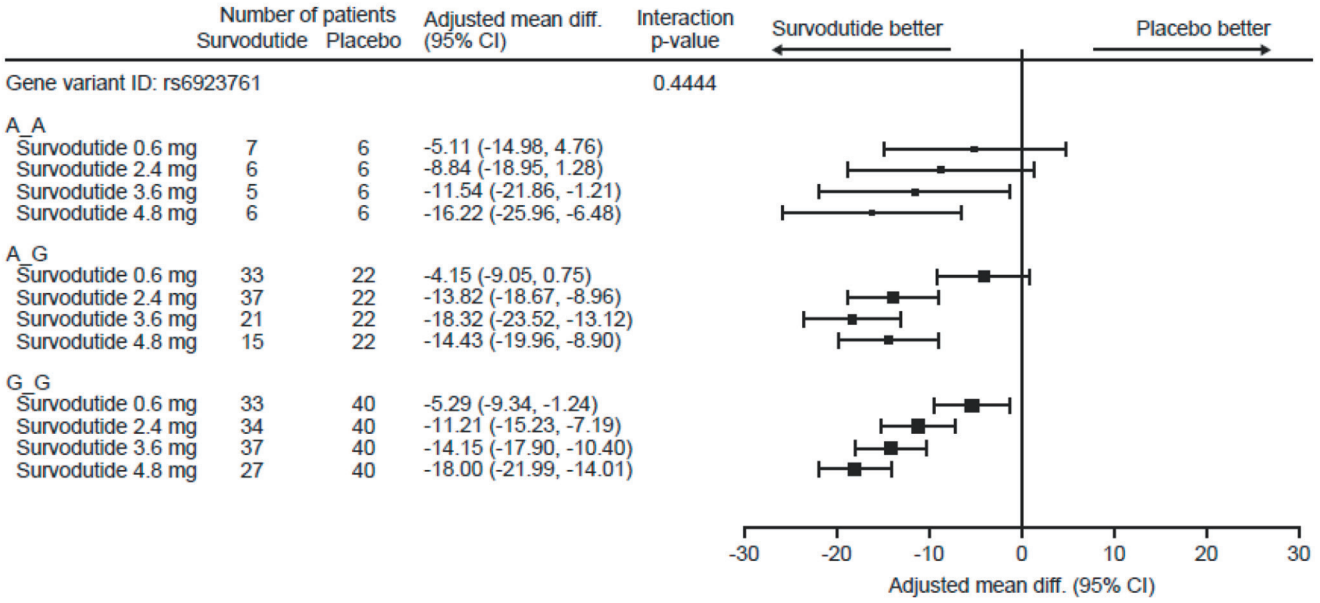


Fig. a. rs6923761.

Forest plot summary of subgroup MMRM analysis for percentage change from baseline in bodyweight (%) at week 46 by genotype – gene variant rs10305420 (FAS; actual treatment; on-treatment)

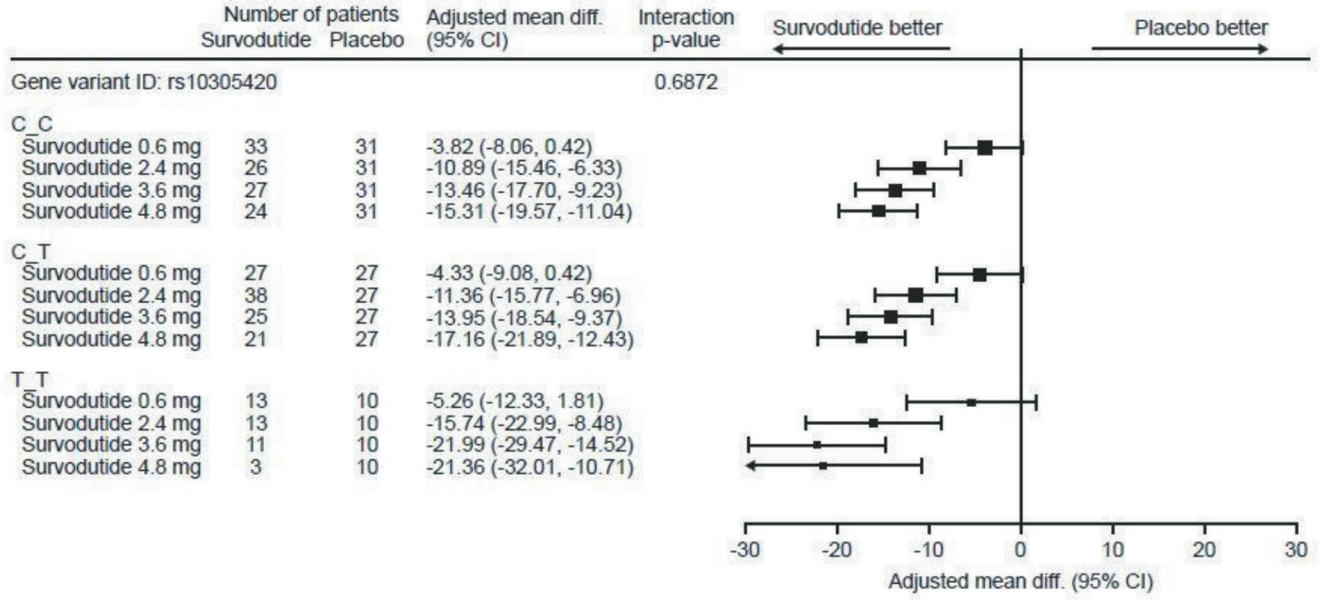


Fig. b. rs10305420.

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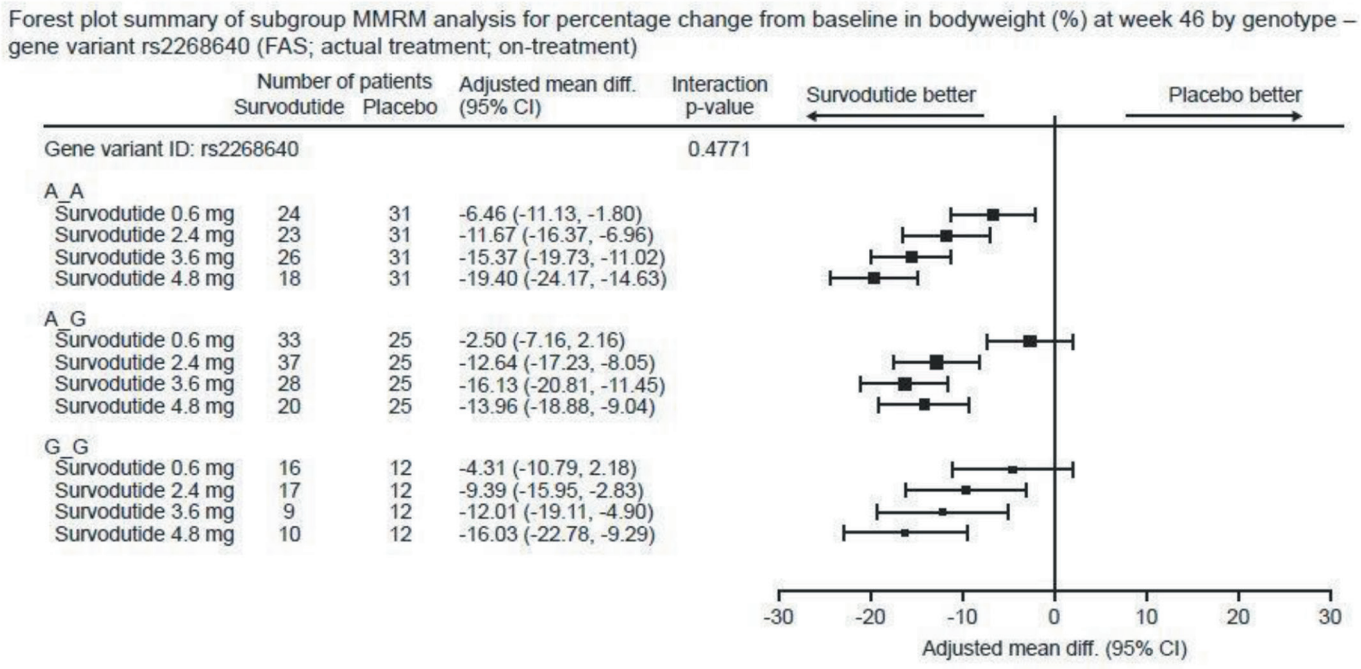


Fig. c. rs2268640.

PO4.008

Thrombelastography in women with overweight and obesity planning pregnancy: impact of BMI on thrombotic risk

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Introduction: The prevalence of obesity among women of reproductive age is increasing, with over 40% worldwide having overweight or obesity at pregnancy onset. Obesity and pregnancy are recognised as prothrombotic conditions and are associated with increased risk of thromboembolic events (e.g., deep vein thrombosis and pulmonary embolism). Conventional coagulation tests link obesity to hypercoagulability, potentially underlying the increased risks and complications associated with overweight and obesity during pregnancy and delivery. The pathophysiological link between overweight and thrombogenesis remains poorly understood, and whether weight loss reduces prothrombotic risk in these high-risk individuals has yet to be studied. A global physiological view of the haemostatic system can be obtained by using thrombelastography (TEG) technique, a whole-blood viscoelastic test that provides data of the entire haemostatic process. Our aim is to investigate the relationship between haemostasis, assessed using TEG, and factors such as body mass index (BMI), body fat percentage, and hepatic steatosis. This research seeks to enhance understanding of how obesity affects the haemostatic system in women with overweight or obesity seeking pregnancy.

Method: The current study presents baseline data from the ongoing PRESTORK trial (NCT05578690). All women were seeking pregnancy within one year and were evaluated before inclusion in the main trial. In a total of 126 women aged 18-38 years with BMI: 27-42 kg/m2 we measured TEG, BMI, body fat percentage (using bioelectrical impedance analysis), and hepatic steatosis (measured by Fibroscan® (controlled attenuation parameter (CAP)). The TEG analysis includes the initiation process of clot formation (R-time), the rate of clot formation (K-time and α-Angle), the clot´s maximum amplitude (MA), the contribution of fibrinogen to clot strength (MA-FF) and the fibrinolytic activity (LY-30). Data were analyzed by simple linear regression models.

Results: For each one-unit increase in BMI and body fat percentage, the clot strength, expressed by MA, increased with 0.34 mm ($p<0.001$, $R2=0.14$ and $p<0.001$, $R2=0.17$) (Figure). The contribution of fibrinogen to the clot strength, MA-FF, increased similarly with 0.44 mm ($p<0.001$, $R2=0.16$) and 0.48 mm ($p<0.001$, $R2=0.24$) respectively. Accordingly, a higher rate of clot formation was also associated with higher BMI and body fat percentage, as expressed by a 0.024 min ($p=0.0059$, $R2=0.052$) and 0.023 min ($p=0.0046$, $R2=0.056$) decrease in K-time and an increase of 0.22 degrees ($p=0.0041$, $R2=0.057$) and 0.20 degrees ($p=0.0042$, $R2=0.057$) α-Angle respectively. Similar associations were seen between CAP and clot strength (MA) and fibrinogen contribution to the clot strength (MA-FF) but not for the rate of clot formation (K-time and α-Angle).

Conclusion: The present study demonstrates that increased BMI and body fat percentage are associated with hypercoagulable findings, as measured by TEG. This contributes to the understanding of the increased susceptibility to thrombotic events during a future pregnancy in women with overweight or obesity.

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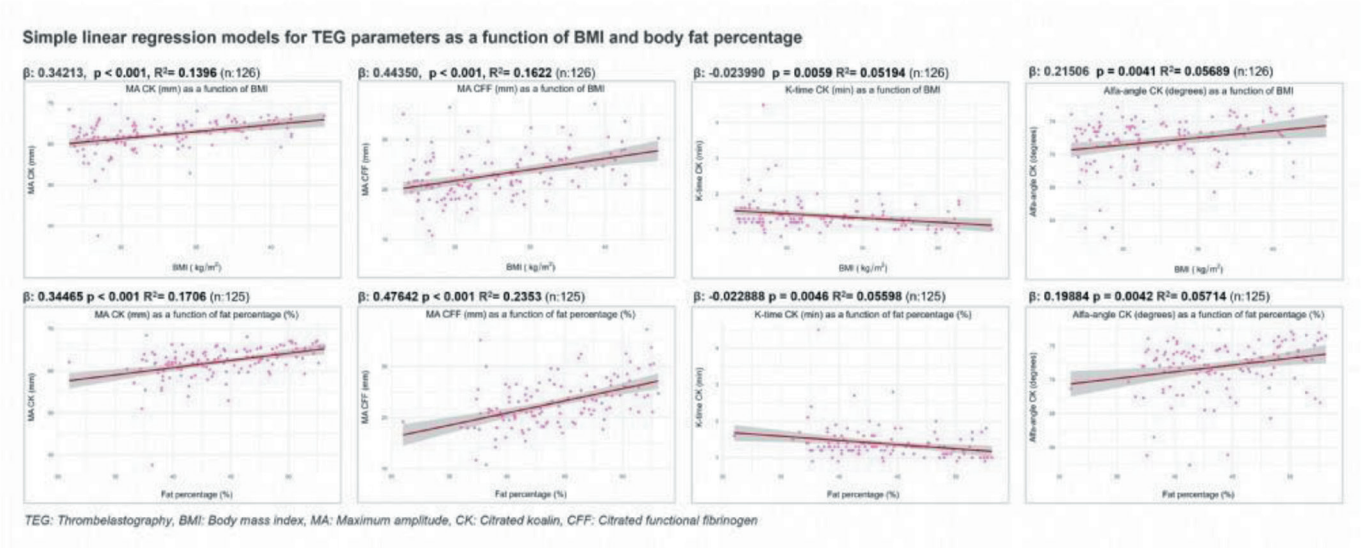


Fig. 1.

PO4.009

Weight regain following the cessation of GLP-1 RAs for weight management: a systematic review and meta-analysis

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Background: GLP-1 receptor agonists (GLP-1 RAs) are increasingly used for the treatment of obesity. We aimed to quantify the rate of weight regain after the cessation of GLP-1 RAs.

Methods: Trial registries, databases and forward citation searching until December 2023 were used to identify randomised and non-randomised trials using GLP-1 RAs (≥8 weeks) in adults with overweight/obesity and reporting measures of body weight ≥4 weeks after the end of treatment. Two independent reviewers screened the studies, extracted the data and assessed the risk of bias. Data were analysed using mixed and time-to-event models for all GLP-1 RAs and for newer and more effective GLP-1 RAs only (semaglutide and tirzepatide).

Results: On average, participants lost 7.9 kg (95% CIs: 5.2-10.7) at the end of treatment with any GLP-1 RA and 16.1 kg (95% CIs: 11.8-20.3) at the end of therapy with newer GLP-1RAs. Thereafter, the rate of weight regain was 0.7 kg/month (95% CIs: 0.6-0.8) and 0.8 kg/month (95% CIs: 0.7-0.9) for all GLP-1RAs (13 intervention arms) and newer GLP-1RAs (3 intervention arms), respectively. The mixed model estimated a regain of 8.3 kg (95% CIs: 6.7-9.8) and 9.6 kg (95% CIs: 7.8-11.4) within the first year after cessation of any GLP-1 RA and newer GLP-1 RAs, respectively. Weight was projected to return to baseline weight by 0.9 years (95% CIs: 0.5-1.3) and 1.7 years (95% CIs: 1.1-2.3) after cessation of any GLP-1RA and newer GLP-1RAs, respectively. Among randomised controlled trials, the model estimated a significantly higher rate of weight regain relative to control by 0.5 kg/month (95% CIs: 0.3-0.8) for GLP-1RAs (p<0.01). It predicted that the time to no difference in weight between intervention and control is 0.8 years (95% CIs: 0.2-1.6) after cessation of any GLP-1RA.

Conclusion: Cessation of GLP-1 RAs leads to return to baseline weight in less than 2 years with no difference to control groups in less than 1 year. This rate of regain is greater than observed following behavioural weight management programmes and sounds a cautionary note to the use of these medications without a more comprehensive approach to the treatment of obesity and prevention of weight regain.

PO4.010

Canagliflozin or acarbose versus placebo to ameliorate post-bariatric hypoglycaemia – the glycaemic variability findings of the HypoBar I randomized clinical trial

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Introduction: Post bariatric hypoglycaemia (PBH) is a late complication of bariatric surgery, that can be impairing and limit quality of life. It is triggered by fast meal absorption followed by pronounced insulin secretion. PBH treatment options are limited and empirical. Acarbose slows down carbohydrates digestion and thus absorption. It is popular for PBH treatment, but it is often associated with gastrointestinal side-effects that limit patient compliance with the treatment. Canagliflozin reduces sodium-dependent glucose absorption in the kidney but also in the gut, and has been shown to change entero-pancreatic hormone dynamics and reduce glycaemic excursions after a meal, so it could potentially be useful for PBH treatment. We aimed at validating acarbose and canagliflozin for the treatment of PBH.

Methods: Eleven people with PBH previously submitted to gastric bypass joined the study and underwent 4-week treatment interventions with acarbose 50 mg thrice daily, canagliflozin 300 mg twice daily and placebo in a cross-over design. Over the last 2 weeks of each intervention, they underwent 10-days continuous glucose monitoring (CGM) and a mixed-meal tolerance test. CGM data was analysed for time under hypoglycaemia (glucose < 3.9 mmol/L; primary endpoint), time in range (3.9-7.8 mmol/L), percentiles and glycaemic variability metrics targeted at the rate of glucose

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changes (mean absolute glucose change [MAG change] and continuous overlapping net glycaemic action [CONGA1]) and variability across days of monitoring (mean of daily differences [MODD]). Each day was parted in day- and night-time for analysis (1-6 a.m.).
Results: Following intention-to-treat analysis, neither of the treatments reduced time under hypoglycaemia significantly ($p > 0.05$), despite there was a tendency for hypoglycaemia amelioration with acarbose. Acarbose increased time in range and reduced the postprandial glucose excursions in test settings. Both treatments lowered the maximum and P90 glucose, slowed glucose postprandial excursions (MAG change and CONGA1) and increased glycaemic stability across the monitored days (MODD) during daytime.
Conclusion: Acarbose has a mild non-significant effect on hypoglycaemia. Canagliflozin has a neutral glycaemic effect. Yet, both treatments reduced the magnitude and speed of glucose fluctuations and increased glycaemic stability during the periods of meal ingestion (daytime). EudraCT 2022-000157-87.

Conflict of Interest: NBJ reports having taken a position with Novo Nordisk A/S, Søborg, Denmark. Other authors have nothing to declare in relation to the current trial.

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PO4.011

Changes in waist circumference and waist-to-height ratio in participants with prediabetes from SM-1 3-year study

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Introduction: The concept of treating to target is well-established in type 2 diabetes and cardiovascular disease (CVD) risk management, but appropriate targets for obesity are not yet clearly defined. Traditionally, reduction in body mass index (BMI) has been used to assess response to obesity treatment, but this method has limitations in evaluating cardiometabolic health gains. This posthoc analysis of the SURMOUNT-1 3-year study assessed changes in BMI, waist circumference (WC), and waist-to-height ratio (WtHR) along with correlations between BMI and WC or WtHR providing evidence for these measures in study participants contributing to the emerging treat-to-target obesity concept.
Methods: SURMOUNT-1 3-year Phase 3, double-blind, randomized, controlled trial included participants with obesity and prediabetes (N=1032) who were randomized in a 1:1:1:1 ratio to receive a once-weekly dose of 5 mg, 10 mg, or 15 mg tirzepatide (TZP) or placebo (PBO) for 176 weeks. This posthoc analysis was conducted using the efficacy analysis from randomized participants with prediabetes grouped by weight, WC, and WtHR. Shifts of the outcome categories from baseline to Week 176 are reported. The correlation between BMI and WC and BMI and WtHR was examined using the Pearson correlation coefficient. The outcomes are presented in scatter plots with an imposed linear regression line. Additional correlations were carried out between HbA1c and BMI, WC, and WtHR (data not shown).
Results: A greater proportion of participants treated with TZP (n=237, 31.1%) improved BMI categories than those treated with PBO (n=10, 3.70%). Similarly, improvements were observed in WC categories (TZP: n=254, 33.3%, PBO: n=12, 4.4%) and WtHR categories (TZP: n=360, 47.2%; PBO: n=26, 9.6%). Results tended to be dose-dependent.
BMI correlated more strongly with WC in participants treated with 10 and 15 mg TZP than PBO (PBO: r=0.79, 5 mg: 0.74, 10 mg: 0.88, 15 mg: 0.87). Select results are highlighted in Figure 1. BMI also tended to be more strongly correlated with WtHR in participants treated with 10 and 15 mg TZP than PBO (PBO: r=0.86, 5 mg: 0.77, 10 mg: 0.90, 15 mg: 0.91), with select results highlighted in Figure 2. There was a slightly stronger correlation between BMI and WtHR than BMI and WC for TZP at baseline and Week 176.
Conclusions: Both BMI to WC and BMI to WtHR correlations were strongly positive, with BMI to WtHR displaying a stronger and more linear correlation in the study population. After 176 weeks of TZP treatment, all correlations remained positive, indicating a consistent reduction in BMI and WC or WtHR. Additionally, correlations generally strengthened in a dose-dependent manner.
The EASO includes WtHR in its new framework for diagnosing, staging, and managing adult obesity. WtHR and WC are cost-effective clinical measures that can shift the focus from weight loss to treating obesity as an adiposity-based chronic disease while introducing obesity targets to treat. Including WC and WtHR alongside BMI for the initial clinical phenotyping of obesity and evaluating treatment response may provide clearer insights into cardiometabolic risk and modification in study participants.

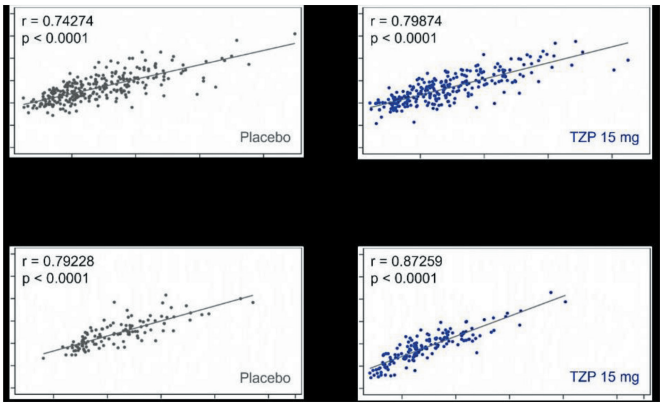


Fig. 1. Scatter plots and Correlations between BMI and waist circumference at baseline and Week 176 show a reduction in BMI and waist circumference and a stronger correlation in participants treated with tirzepatide over time. The efficacy analysis set was used, and "r" is Pearson correlation coefficients; "p" is the p-Value for correlation coefficients. The solid line is a simple regression line of WC on BMI.

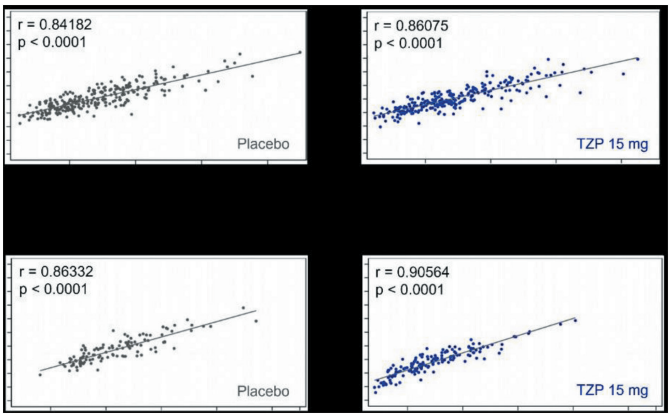


Fig. 2. Correlation between BMI and the waist-to-height ratio at baseline and Week 176 shows a reduction in BMI and waist-to-height ratio and a stronger correlation in participants treated with tirzepatide over time. The efficacy analysis set was used, and "r" is Pearson correlation coefficients; "p" is the p-Value for correlation coefficients. The solid line is a simple linear regression line of WtHR on BMI.

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PO4.012

Associations between tirzepatide treatment and bodily pain in people with obesity: a post-hoc analysis of the SURMOUNT trials

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Introduction: Many obesity-related complications (ORCs) can contribute to a person living with physical pain. Pain may be underrecognized in patients living with obesity. Tirzepatide is a once-weekly GIP and GLP-1 receptor agonist approved for the treatment of both type 2 diabetes and obesity in adults. In the SURMOUNT-1, -3, and -4 (SM-1, -3, -4) trials, participants with obesity or overweight and without diabetes treated with tirzepatide lost 15-25% of body weight from baseline over 72 or 88 weeks. The aim of this post-hoc analysis of SM-1, -3, -4 trial data was to evaluate the change in bodily pain by baseline pain scores as measured by SF-36v2 Bodily Pain Domain among participants with obesity.
Methods: On-treatment data from randomized participants in the SM-1, -3, and -4 trials were used. Pain and interference with normal work was assessed using the SF-36v2 Bodily Pain Domain at baseline and end of treatment [week 72 (SM-1 and -3) or 88 (SM-4), or early treatment discontinuation]. Higher scores on SF-36v2 reflect better quality of life, thus, lower scores indicate higher self-reported pain. Participants were categorized into the higher pain group (if SF-36 Bodily Pain score at baseline was <25th percentile) and the lower pain group (≥25th percentile).
Results: At baseline (randomization for SM-1 and lead-in for SM-3 and SM-4), participants in the higher pain group of SM-1 (N=515), -3 (N=128), and -4 (N=162) had mean body weight of 108 to 113 kg, mean BMI 40 kg/m2, and mean age 48 to 51 years. Participants in the lower pain group of SM-1 (N=2017), -3 (N=447), and -4 (N=508) had mean body weight of 104 to 108 kg, mean BMI 38 kg/m2, and mean age 44 to 47 years. In SM-1, SF-36v2 Bodily Pain score increased (improved) with tirzepatide treatment in the high pain group (placebo-adjusted least squares mean (LSM) change from baseline to week 72 = 2.3, 3.0, and 2.5 for 5mg, 10mg, and 15mg, respectively) and in the low pain group (placebo-adjusted LSM change = 1.1, 1.4, and 2.4 for 5mg, 10mg, and 15mg, respectively), with the degree of increment being numerically higher in the high pain group. Body weight reduction with tirzepatide treatment was comparable between the high pain group (placebo-adjusted LSM percent change -13.6%, -19.1%, and -20.7% for 5mg, 10mg, and 15mg, respectively) and the low pain group (placebo-adjusted LSM percent change -13.6%, -18.9%, and –20.1% for 5mg, 10mg, and 15mg, respectively). Results of SM-3 and SM-4 were consistent with those of SM-1.
Conclusion: In this post-hoc analysis of the SM studies, tirzepatide treatment was associated with improvement in bodily pain domain scores, especially in participants with higher baseline bodily pain score. Reduction in body weight with tirzepatide treatment was similar in those with higher and lower bodily pain score thus highlighting that bodily pain may not be a barrier to effective weight reduction. These data could provide additional considerations for individualized obesity care.

PO4.013

Weight Status-associated Brain Connectome Biomarkers of Quantitative Brain Magnetic Resonance Imaging in Patients with Obesity

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Introduction: Obesity profoundly affects the brain's neural pathways, disrupting the equilibrium between reward-seeking behaviors and cognitive control mechanisms. This study examines the correlation between body mass index (BMI) and the brain's connectome by analyzing differences in structural and functional brain connectivity, as delineated through diffusion imaging and functional magnetic resonance imaging (MRI).
Methods: Conducted from August 2021 to June 2023, this prospective cohort study included 40 patients with obesity and eight age- and gender-matched normal-weight controls. All underwent brain MRI scans. Diffusion MRI data were used to compute the fractional anisotropy (FA) skeleton via tract-based spatial statistics, with subsequent voxel-wise regression analysis against BMI using statistical parametric mapping. Resting-state fMRI data were similarly analyzed to produce maps of fractional amplitude of low-frequency fluctuations (fALFF), also correlated with BMI. Analyses controlled for age and gender, with a significance level set at $p < 0.001$. Primary outcomes included parametric maps for FA, mean diffusivity, radial diffusivity, axial diffusivity, and fALFF.
Results: The study included 36 women (75%) and 12 men (25%), with a median age of 47 years (interquartile range: 30 to 53) and a median BMI of 29.7 kg/m² (interquartile range: 25.9 to 32.0). Diffusion MRI analysis revealed a significant association between BMI and FA in the left superior longitudinal fasciculus, a region linked to cognitive control (T value: 4.30 to 6.08, $p < 0.001$; Figure 1A). Resting-state functional MRI identified significant correlations between BMI and fALFF in four brain regions: the corpus callosum, which is involved in intra-hemispheric connectivity related to hedonic feeding decisions; the left medial orbital frontal cortex, associated with the valuation of food and reward; the right posterior cingulate gyrus, implicated in the food reward process; and the angular gyrus, which responds to food rewards (T values: 5.75 to 8.23, all $p < 0.001$; Figure 1B and Table 1).
Conclusion: Our findings reveal a strong correlation between increased BMI and alterations in MRI biomarkers within brain regions linked to eating behavior, indicating a shift in obese individuals toward neural networks that prioritize external stimuli over hedonic decision-making processes. Connectome analysis via brain MRI thus provides crucial insights into the disrupted balance between reward-seeking and cognitive control circuits in obesity.

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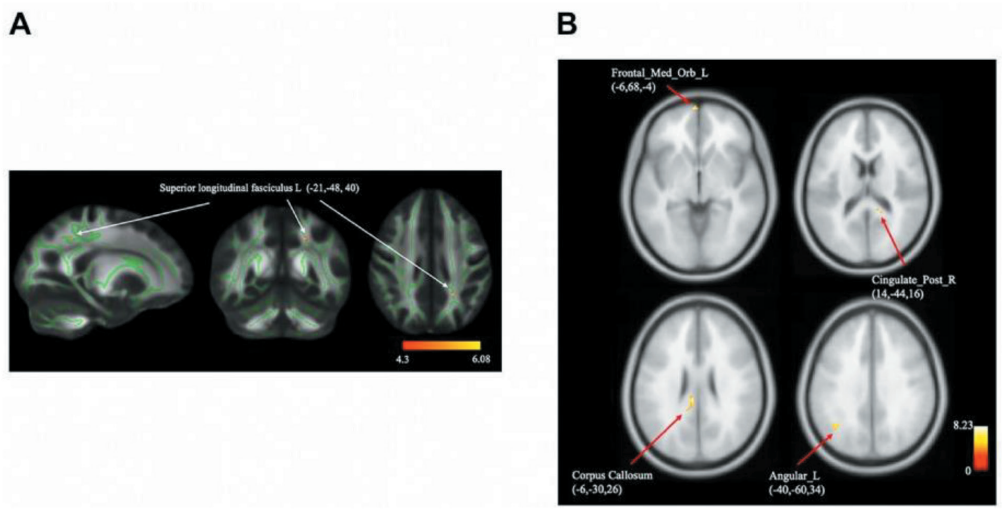


Fig. 1. (A) Diffusion magnetic resonance imaging (MRI) analysis reveals a significant association between body mass index (BMI) and fractional anisotropy (FA) in the left superior longitudinal fasciculus. (B) Resting-state functional MRI analysis demonstrates significant correlations between BMI and fractional amplitude of low-frequency fluctuations (fALFF) in four brain regions: corpus callosum, left medial orbital frontal cortex (Frontal_Med_Orb_L), right posterior cingulate gyrus (Cingulum_Post_R), and angular gyrus (Angular_L).

Tab. 1. The results of the regression analysis with body mass index (BMI) value and fractional amplitude of low-frequency fluctuations (fALFF).

			Montreal Neurological Institute (MNI) Coordinates [mm]		
Cluster size [voxels]	Anatomical Automatic Labeling (AAL) Region	X	Y	Z	T- value
36	Corpus Callosum	-6	-30	26	8.23
15	Frontal_Med_Orb_L	-6	68	-4	7.42
10	Cingulum_Post_R	14	-44	16	5.90
16	Angular_L	-40	-60	34	5.75

PO4.014

Ketogenic diet is less effective in ameliorating depression and anxiety in Obesity than mediterranean diet: exploring the GUT-Brain axis

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Introduction: Obesity is associated with increased depressive symptoms due to biological and psychological factors. Dietary interventions, including the ketogenic (Keto) and Mediterranean (Med) diets, impact weight loss and mental health differently. While the Keto diet promotes rapid weight loss by increasing ketone body levels, its effects on mental health, particularly in individuals with obesity, remain unclear. This study explores the impact of both diets on depression and impulsiveness, focusing on the gut-brain axis.
Methods: A cohort of 60 individuals with obesity (BMI >30, no diabetes) was randomized to follow a 3-month Keto or Med diet. Depression (BDI) and impulsive (UPPS) scores were evaluated before and after the intervention. Stool samples were collected for microbiota analysis and fecal transplantation in healthy mice to assess microbiota-mediated behavioral changes. Brain and serum metabolites in recipient mice were analyzed using HR-MAS and 1H NMR spectroscopy.
Results: The Med diet showed greater improvement in depression and impulsivity scores compared to Keto. Fecal transplants from Keto participants induced anxiety-like behaviors in recipient mice, correlating with significant microbiota and metabolite changes. The Keto group exhibited increased levels of taurine, alanine, and betaine in the brain, while succinate levels decreased. Threonine levels were strongly correlated with behavioral changes and gut-brain axis disruption.
Conclusion: The Med diet demonstrated superior mental health benefits compared to the Keto diet. The findings highlight the role of diet-induced microbiota changes and metabolite alterations in the gut-brain axis. Tailored dietary interventions may be essential for optimizing mental and physical health outcomes in obesity.

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PO4.015

Postprandial plasma bile acid response is elevated after bariatric surgery in persons with type 2 diabetes and obesity compared with obesity alone

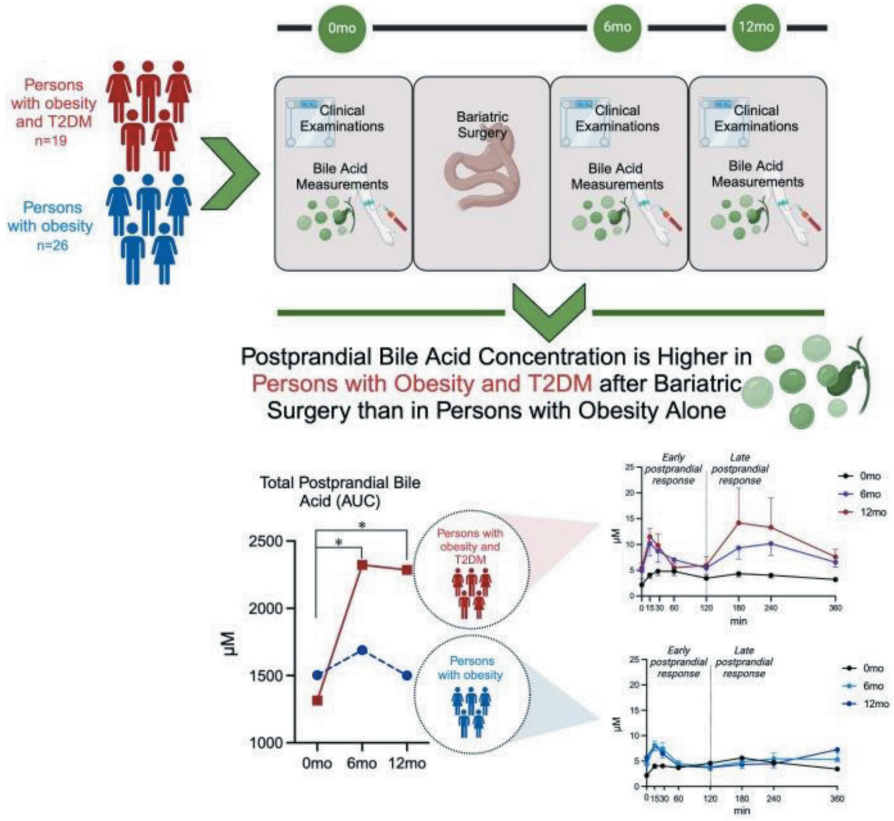
Kontro Rosales, A.[1]; *Karppinen, J. E.*[1]; *Saarinen, T.*[2]; *Kuula, J.*[3]; *Groop, P.-H.*[4]; *Neuvonen, M.*[5]; *Niemi, M.*[5]; *Juuti, A.*[2]; *Pietiläinen, K.*[1]; *Heinonen, S.*[1]

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Introduction: Bariatric surgery (BS) is an effective treatment for obesity and type 2 diabetes mellitus (T2DM). Elevated bile acid (BA) concentrations post-surgery is proposed as one key factor behind the metabolic improvements. Knowledge on the effects of T2DM status in these changes is still lacking. This study aimed to determine whether individuals with obesity and T2DM compared to those with obesity alone exhibit different alterations in their BA profiles following weight loss through BS for 1 year, and whether these BA changes are associated with the metabolic improvements observed.
Methods: This study included 45 adults with obesity (15 males, 30 females) who underwent BS (25 Roux-en-Y gastric bypass, 20 One-anastomosis gastric bypass) and were followed up until one year post-operatively. Participants were categorized into two groups: Obesity with T2DM (n=19) and Obesity (n=26) based on their T2DM status at baseline. Clinical measurements and circulating plasma BA concentrations at fasting and postprandially during a mixed meal test (MMT) of 360 minutes were measured at three time points: 8 weeks before, and 6 and 12 months after BS. We investigated 14 individual BAs, 7-HCO -an intermediate metabolite of the BA synthesis, total BAs, 16 BA groups and ratios between BA groups. Between-group differences in changes as well as associations between changes in BAs and clinical characteristics were analyzed by linear mixed-effects models.
Results: Significant weight loss and metabolic improvements occurred in both groups during the follow-up. However, greater improvements in weight, fat %, liver fat, HbA1c, and fasting glucose ($p<0.05$) were observed in persons with T2DM. Postprandial BAs (total, primary, conjugated, non12a-hydroxylated, hydrophobic, and hydrophilic), and 7-HCO increased significantly more in persons with obesity and T2DM compared to those without T2DM from baseline to 6 and 12 months ($p<0.05$ all). Mean change in postprandial total BAs from baseline to 12 months was +970,9μM in persons with T2DM, and -2,0μM in persons with obesity alone. The differences were driven by the late postprandial response (120-360 min of the MMT). Additionally, increases in BAs (total, conjugated primary, primary, non-12α-hydroxylated, and unconjugated) had greater associations with AUC-insulin values in persons with T2DM than those with only obesity during weight loss, suggesting a better coordination of BA-insulin responses post-operatively.
Conclusions: Post BS, persons with obesity and T2DM experience greater increase in their postprandial BA concentrations when compared to persons with only obesity. This increase is mainly driven by the late postprandial response of conjugated and primary BAs. The results indicate that the metabolic status of the person relates to the improvement of BA levels and can have implications for therapeutic approaches.

Conflict of Interest: No conflict of interest.

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Graphical abstract of the study setup and main results

Fig. 1. Graphical abstract.

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PO4.016

ASC47, a Muscle-Preserving Weight Loss Drug Candidate in Healthy Participants: A First-in-human Single Ascending Dose Study

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Introduction: ASC47 is a first-in-class, adipose-targeted, once-monthly subcutaneously injected, muscle-preserving weight loss drug candidate for the treatment of obesity. ASC47 is a new molecular entity as well as a potent and selective small molecule thyroid hormone receptor beta (THR-β) agonist discovered and developed in-house at Ascletis. ASC47 possesses unique and differentiated properties, in combination with ultra-long-acting subcutaneous (SQ) injection administration, enabling adipose targeting, resulting in dose-dependent high drug concentrations in the adipose tissue. In a head-to-head diet-induced obese (DIO) mouse study, ASC47 reduced more fat and increased muscle in a dose-dependent manner compared to Semaglutide. The current study assessed the safety, tolerability, and pharmacokinetics of ASC47 injection in a first-in-human single ascending dose study in healthy participants with elevated LDL-C.
Methods: This study was a randomized, double-blind, placebo-controlled, single ascending dose trial conducted in healthy participants with LDL-C > 2.8 mmol/L. A total of 20 eligible healthy participants were enrolled, with 4 receiving a single dose of ASC47 (10 mg or 30 mg) and 2 receiving a matching placebo in each of the first two dose groups. In the third dose group, 6 participants received a single dose of 90 mg ASC47 and 2 received a matching placebo.
Results: ASC47 demonstrated target engagement, with significant reductions in lipid biomarkers (such as LDL-C and TC) observed on Day 29 after a single SQ injection. Table 1 shows preliminary pharmacokinetic analyses supporting once-month SQ dosing for chronic weight management. The most common adverse events were injection site reactions (including erythema, pain, and pruritus), which resolved without intervention in most cases. These reactions occurred predominantly in the higher-dose group (90mg). No serious adverse events were reported, and there were no clinically significant changes in vital signs or laboratory parameters.
Conclusions: ASC47 exhibited a good safety and tolerability profile, target engagement, and superior PK profile, supporting further clinical evaluation as either once-monthly monotherapy or combination therapy with incretin-based drugs for chronic weight management.

Tab. 1. ASC47 demonstrated a superior and dose-proportional PK profile in humans.

Cohort (n)	Cohort 1 (n=4)	Cohort 2 (n=4)	Cohort 3 (n=6)
ASC47 concentration (mg/mL)	100	300	300
Dose (mg)	10	30	90
T1/2 (hr)	284.29±139.72	625.07±279.21	345.39±112.57
Tmax (hr)	258.00±136.29	276.00±124.71	204.00±84.17
Cmax (ng/mL)	6.54±2.08	7.46±2.20	35.79±25.92
AUClast (hr*ng/mL)	3,237.44±1498.82	4,493.50±1012.18	15,282.77±7831.08
AUCinf (hr*ng/mL)	3,744.27±1737.29	5,748.37±1272.63	17,499.43±8351.99

Note: * Participants in Cohort 1 and Cohort 2 were followed up for up to 57 days (1344 hours). Participants in Cohort 3 were followed up for a duration ranging from a minimum of 43 days (1008 hours) to a maximum of 57 days (1344 hours).

PO4.017

The prevalence of Overweight and Obesity among Athletes: Why WHO BMI Classification Does not fit?

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Introduction: Body composition in athletes is characterized by an increased muscle mass and reduced body fat (BF), hence the indicators of excessive adiposity (i.e. overweight and obesity) are more likely to occur at higher cut-points of body mass index (BMI) with respect to the ones on which the World Health Organization (WHO) relies. Therefore we aimed to test the validity of BMI cut-off points for overweight (≥25 kg/m²) and obesity (≥30 kg/m²) status in young adult male athletes from different sport disciplines in Italy.
Methods: This cross-sectional study is composed of 622 male adult athletes aging between 20 and 40 years, and BMI≥20 kg/m². Initially the sample was categorized according to the WHO BMI classification system and afterward was re-categorized by adiposity status based on the total BF% as measured by dual-energy X-ray absorptiometry (DXA). A predictive equation based on BF% was developed using multivariable model-building to predict the best new BMI cut-offs for identifying overweight and obesity in this specific population. The agreement between the classification systems was performed using kappa statistic.
Results: According to the WHO BMI classification, only 451 (72.5%) individuals were of normal-weight, and 148 (23.8%) and 23 (3.7%) with overweight and obesity respectively. While when the sample was re-categorized by adiposity level based on the total BF%, 590 (94.8%) individuals were of normal weight, and only 25 (4.1%) were overweight and 7 (1.1%) were with obesity. Hence, revealing a strong disagreement between the classification systems (WHO BMI vs. BF%). A kappa of 0.218 reflected a weak agreement and an overestimation of the prevalence of overweight and obesity based on WHO BMI cut-offs (i.e. overweight ≥25 kg/m² and obesity ≥30 kg/m²). Finally based on the predictive equation, new BMI cut-off has been identified as BMI≥28.2 kg/m² for overweight and 33.3 kg/m² for obesity in male athletes, that showed a good agreement as reflected by a kappa of 0.541. Accordingly performed better in distinguishing between normal weight, overweight and obesity in this population.
Conclusions: The WHO BMI system is not suitable for the classification of young adult male athletes while screening for overweight and obesity, where body composition assessment remains the most accurate technique to this aim. Otherwise, the new BMI cut-points that we are proposing showed excellent performance, therefore should be implemented in national guidelines used to assess body weight status in young adult male athletes in Italy as the current one (i.e. WHO BMI) in use need mandatorily to be revised accordingly.

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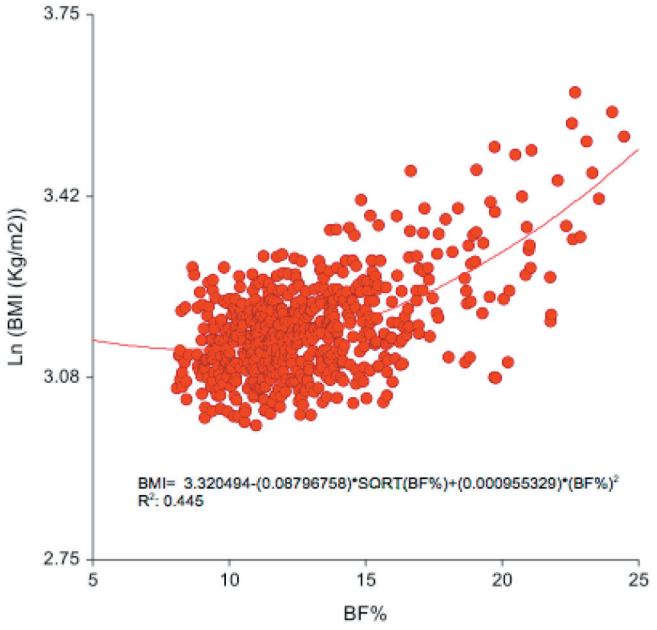


Fig. 1. BMI predictive equation using multivariable model-building based on BF%.

Tab. 1. Classification of the sample based on WHO BMI, BF%, new BMI cut-off.

Sample classification	Normal weight n (%)	Overweight (%) n (%)	Obesity (%) n (%)
WHO BMI	451 (72.5%)	148 (23.8%)	23 (3.7%)
BF%	590 (94.8%)	25 (4.1%)	7 (1.1%)
New BMI	580 (93.3%)	33 (5.3%)	9 (1.4%)

PO4.019

Prevalence of sarcopenic obesity in candidates for bariatric surgery: A Multicentre Register from the Area of Obesity of the Spanish Endocrinology Society

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Introduction: Sarcopenic obesity (SO) is defined as a combination of low strength and muscle mass along with excess adiposity and it is associated with adverse outcomes. Our study aimed to determine the prevalence of sarcopenic obesity, according to ESPEN/EASO criteria, in candidates for bariatric surgery,as a part of a Spanish multicentre Register.

Methods: Prospective multicentre study of adult patients (18-60 years) candidates for bariatric surgery (BMI 40 kg/m2 or 35 kg/m2 with associated complications). Dual energy X-ray absorptiometry (DXA) was performed using a Horizon Wi densitometer (Hologic Inc., Bedford, MA, USA). Adiposity was assessed by the percentage of fat mass, according to Gallagher's cut-off points1. Muscle mass was assessed by ALM/weight, with cut-off points according to Batsis2. Muscle strength was measured by a Jamar dynamometer, using cut-off points for Spanish population according to Sanchez-Torralvo3, and five-times sit-to-stand test (5T-STST).
Results: A total of 482 subjects were included (71% women, 29% men), mean age was 50.5(SD 8.6) years-old, BMI 46.2(SD 6.3) kg/m2. In women, body fat percentage (BF%) was 51.1(SD 4.4), visceral fat 292.1 cm3 (SD 92.3), low appendicular lean mass (ALM/weight) was observed in 24.6%, low handgrip strength in 13.5% and following ESPEN/EASO criteria, 5.26% were categorized as having SO. In men, BF % was 46.2(SD 5.1), visceral fat 373.4 cm3(SD 134.9), low ALM/weight was observed in 77.1%, low handgrip strength in 39.3% and 33.5% were categorized as having SO. Osteosarcopenia was present in 3.5% of women and 30% of men. A SARC-F-score ≥4 was obtained in 30% of women and 20% in men. 5T-STST 3.8% of women had > 9.2 s and 20% of men >10.8 s.
Conclusions: The prevalence of SO according to ESPEN/EASO criteria in candidates for bariatric surgery was very high, mainly in men, based on the diagnostic method and cut-off points used. These findings highlight the importance of a presurgical body composition assessment of patients. Further studies will be needed to assess the evolution and impact of SO on surgical outcomes.

Reference

1 Am J Clin Nutr 2000;72:694–701; 2 J Am Geriatr Soc 2013;61(6):974-80; 3 Nutr Hosp 2018;35:98-103.

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PO4.020

Weight loss-related changes in MRI-derived measures of body composition and liver health: a large-scale analysis from the UK Biobank

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Perspectum Ltd.

Introduction: Amid rising global obesity rates and advances in weight-loss therapies, measuring body composition and ectopic fat relative to weight loss could refine treatment strategies. We investigated weight loss-related changes in body composition and liver health in the UK Biobank.
Methods: Participants (N=2,204) from the UK Biobank with whole-body MRI scans from two visits, spaced 1-3 years apart (mean 2.3 years), were included. MRI data were processed automatically to derive volumetric visceral adipose tissue (VAT), subcutaneous adipose tissue (SAT), skeletal muscle volume (SMV) and index (SMI), and psoas muscle cross-sectional area (CSA) in the abdominal region. Liver fat content (LFC) and liver inflammation (cT1) were assessed using LiverMultiScan. Participants were categorized into two groups based on relative weight change across visits: ≥5% weight loss and <5% weight loss. Causes of weight loss were not investigated. Within-group comparisons were conducted using the paired Wilcoxon signed-rank test, while between-group comparisons were assessed with the Wilcoxon rank-sum test.
Results: In the ≥5% weight loss group (N=220, age 64 years, male 43%, BMI 27 kg/m², baseline VAT 3.6L, SAT 7.2L, SMV 5.2L, SMI 43 cm²/m², psoas CSA 14.8 mm², LFC 3.5%, cT1 701 ms), significant % reductions from baseline were observed: LFC -26%, VAT -24%, SAT -17%, SMV -3.8%, psoas CSA -5%, SMI -3% (all p<.001). Liver cT1 decreased by 8 ms, which was not clinically significant. In the <5% weight loss group (N=1,872, mean age 64 years, male 50%, BMI 25 kg/m², baseline VAT

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3.1L, SAT 5.9L, SMV 5.5L, SMI 43 cm^2/m^2, psoas CSA 15.7 mm^2, LFC 3%, cT1 689 ms), no significant reductions were observed in any of the body composition or liver metrics. Between-group comparisons showed significant differences across all metrics (p<.001).
Conclusion: A weight loss of at least 5% causes a 3% decrease in skeletal muscle index and a 5% decrease in psoas muscle cross-sectional area.

PO4.021

Nasal exposure to a volatile odorant compound enhances resting energy expenditure and body temperature in individuals living with obesity

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Introduction: Volatile odorants form a dynamic airborne messenger hub containing important information about the environment to orchestrate organismal responses. Preliminary studies in mice identified a highly volatile natural odorant ("odorant") that enters the brain upon inhalation to reduce calorie intake and to increase brown adipose tissue (BAT) activity specifically in mice with obesity.
The aim of the present trial was to investigate if the identified odorant molecule, compared to placebo, impacts resting EE (REE) and body temperature (BT) in humans with obesity and lean controls.
Methods: In a crossover, randomized, placebo-controlled, single-center trial n=20 participants with normal body weight and n=20 participants living with obesity w/o diabetes mellitus were enrolled. Participants with normosmia, confirmed via the Sniffin' Sticks Test and no severe comorbidities were included. The study participants were nasally exposed to the "odorant" or placebo for 90 min via a device that was clipped to the nasal septum allowing the "odorant" or placebo, respectively, to evaporate naturally into the nasal cavity from where it was inhaled. Participants were exposed to the "odorant" or placebo during two study visits, with a wash-out period of 1–7 days between visits. REE was assessed via indirect calorimetry in the morning after an 8 h-overnight fasting period at baseline (for 30 min) and afterwards for 90 min during volatile stimulation. Core BT was assessed via infrared tympanic measurement before and after volatile stimulation. The primary endpoint was the change in average of REE and Respiratory Exchange Ratio (RER) during the last 30 minutes compared to the first 30 minutes of stimulation and was calculated as delta (last 30 minutes – first 30 minutes).
Results: In the group of individuals living with obesity, REE increased by 60.61 ± 23.47 kcal/day upon "odorant" stimulation and by 7.43 ± 25.80 kcal/day upon placebo, with a significant difference between the two treatments (63.37 ± 24.05, p = 0.017*). RER did not change upon "odorant" stimulation compared to placebo (p=0.444). Core BT increased by 0.055 °C (p = 0.011*) upon 90 min odorant exposure while no significant change was observed upon placebo stimulation (p=0.300).
In the lean group, REE increased by 63.89 ± 31.35 kcal/day upon "odorant" stimulation and by 9.36 ± 29.12 kcal/day upon placebo with no significant difference between treatments (54.53 ± 41.13, p=0.201). "Odorant" exposure did not significantly impact RER (p = 0.135). Core BT increased by 0.279 °C (p = 0.001**) upon "odorant" stimulation while there was no change upon placebo treatment (p=0.163).
Conclusion: The identified volatile natural odorant compound may enhance REE and thermogenesis in humans. While odorant effects on REE were more pronounced in individuals living with obesity, effects on thermogenesis were more pronounced in lean controls. Our findings highlight natural volatile odorants as airborne bioactive compounds with the potential to impact systemic metabolism in humans. This might open new trajectories for the treatment of patients living with overweight and obesity in the future.

PO4.023

The effect of an ultra-processed diet rich in saturated fats on type 2 diabetes mellitus and obesity

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Introduction: Increasing evidence highlights the harmful effects of excessive consumption of ultra-processed foods and saturated fats on the progression of chronic non-communicable diseases, particularly in patients with Type 2 Diabetes Mellitus (T2DM) and Obesity. In this context, the objectives of this research were to analyze the diet of patients with T2DM and Obesity treated in a medical outpatient clinic over 12 months, and to evaluate the effect of this diet on anthropometric and laboratory parameters.
Methods: This study recruited 40 participants with T2DM and Obesity, on using hypoglycemic and antihypertensive medications, whose diets were analyzed and monitored over 12 months. Parametric data were compared using paired t-tests, while non-parametric data were compared using Wilcoxon tests. Parametric data were represented by mean ± standard deviation, and non-parametric data by median ± interquartile range. A significance level of p<0.05 was adopted.
Results: A high intake of ultra-processed foods rich in saturated fats was observed over 12 months (cakes, cookies, sweets, savory snacks, chips, hamburgers, fast food, delivery food, and frozen foods). At baseline, participants consumed a diet comprising 47.15 ± 1.6% carbohydrates, 16.2 ± 2.4% proteins, and 35.8 ± 5.5% fats (48.8 ± 5.9g saturated; 16.3 ± 2.4g monounsaturated; 5.1 ± 2.9g polyunsaturated), with a Total Energy Value (TEV) of 2003.98 ± 105.33 kcal. By the 12th month, participants' diets consisted of 48.2±6.8% carbohydrates, 15.8±2.3% proteins, and 36.3 ± 5.24% fats (48.3 ± 1.9g saturated; 12.8 ± 1.4g monounsaturated; 8.1 ± 2.9g polyunsaturated), with a TEV of 2006.5 ± 103.4 kcal. Significant increases were observed in several analyzed anthropometric and laboratory parameters (glycated hemoglobin, LDL cholesterol, weight, BMI, and waist-hip ratio) between baseline and the 12th month (p<0.05).
Conclusion: The ultra-processed diet rich in saturated fats worsened anthropometric and laboratory parameters over 12 months in patients with T2DM and Obesity, even using hypoglycemic and antihypertensive medications.

Conflict of Interest: None Disclosed.

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PO4.024

Quantitative Analysis of the Caloric Restriction versus Isocaloric Diets Models based on Macronutrients Composition: Impacts on Body Weight Regulation, Anthropometric and Bioimpedance Parameters in Women with Obesity

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Introduction: Obesity is currently a major public health concern due to the significant increase in prevalence, particularly among young adults, with long-term therapeutic management still under debate. This prospective observational study aims to quantitatively compare the effects of caloric restriction and isocaloric diets with varying macronutrient distributions on body composition and anthropometric indices in obese women over a 12-week monitored weight loss program, with the goal of identifying the most effective dietary strategies for managing obesity-related health outcomes.

Methods: Each participant was assigned a 12-week diet by a certified clinical nutritionist, categorized as hypocaloric: low-energy diet (LED) and very low-energy diet (VLED), isocaloric with macronutrient distribution: low carbohydrate diet (LCD), ketogenic diet (KD) and high protein diet (HPD) and isocaloric without macronutrient distribution: time restricted eating (TRE). Participants were dynamically monitored using anthropometric parameters: body mass index (BMI), waist circumference (WC), waist to hip ratio (WHR) and bioelectrical impedance analysis using the TANITA Body Composition Analyzer BC-418 MA III (T5896, Tokyo, Japan) at three key intervals—baseline, 6 weeks, and 12 weeks. The following parameters were evaluated: body weight (kg), basal metabolic rate (BMR), percentage of total body fat, trunk fat, muscle mass, fat-free mass (kg), and hydration status (%).

Results: All diets demonstrated efficacy in reducing body weight by the study's conclusion, though significant differences in weight loss emerged over time between them. The TRE model resulted in significantly less weight loss compared to the LED at the final follow-up (6.30 kg, 95% CI: 4.08 to 8.51, p<0.001). Similar and unexpected results were also observed with the VLED (4.69 kg, 95% CI: 2.28 to 7.10, p<0.001). Participants on isocaloric diets with varied macronutrient distributions achieved significantly greater weight loss compared to those on the LED diet by the conclusion of the study (p<0.001). The KD led to significant reductions in WC at both 6 weeks (-2.70 cm, 95% CI: -4.61 to -0.79, p = 0.006) and 12 weeks (-4.08 cm, 95% CI: -5.99 to -2.17, p < 0.001). At 12 weeks, a significant difference in WHR was observed among diet groups (p = 0.01), indicating varying effectiveness in reducing WHR. Post-hoc analysis showed significant fat mass differences at 12 weeks between HPD and IF (p=0.01) and HPD and VLED (p=0.003), highlighting HPD's enhanced effectiveness in reducing fat mass. LCD was highly effective, significantly reducing trunk fat at 6 weeks (-2.36%, p = 0.001) and 12 weeks (-3.79%, p<0.001). The HPD increased muscle mass at 12 weeks (2.95%, p = 0.001), while VLED decreased it (-2.02%, p=0.031). The TRE diet showed a smaller BMR reduction at 12 weeks compared to LED (35.95 kcal/day, 95% CI: 2.55 to 69.36, p = 0.035), suggesting it may better preserve BMR over time.

Conclusion: This study highlights the superior long-term benefits of isocaloric diets with macronutrients distribution over calorie-restrictive diets in optimizing weight, BMI, body composition, and central adiposity.

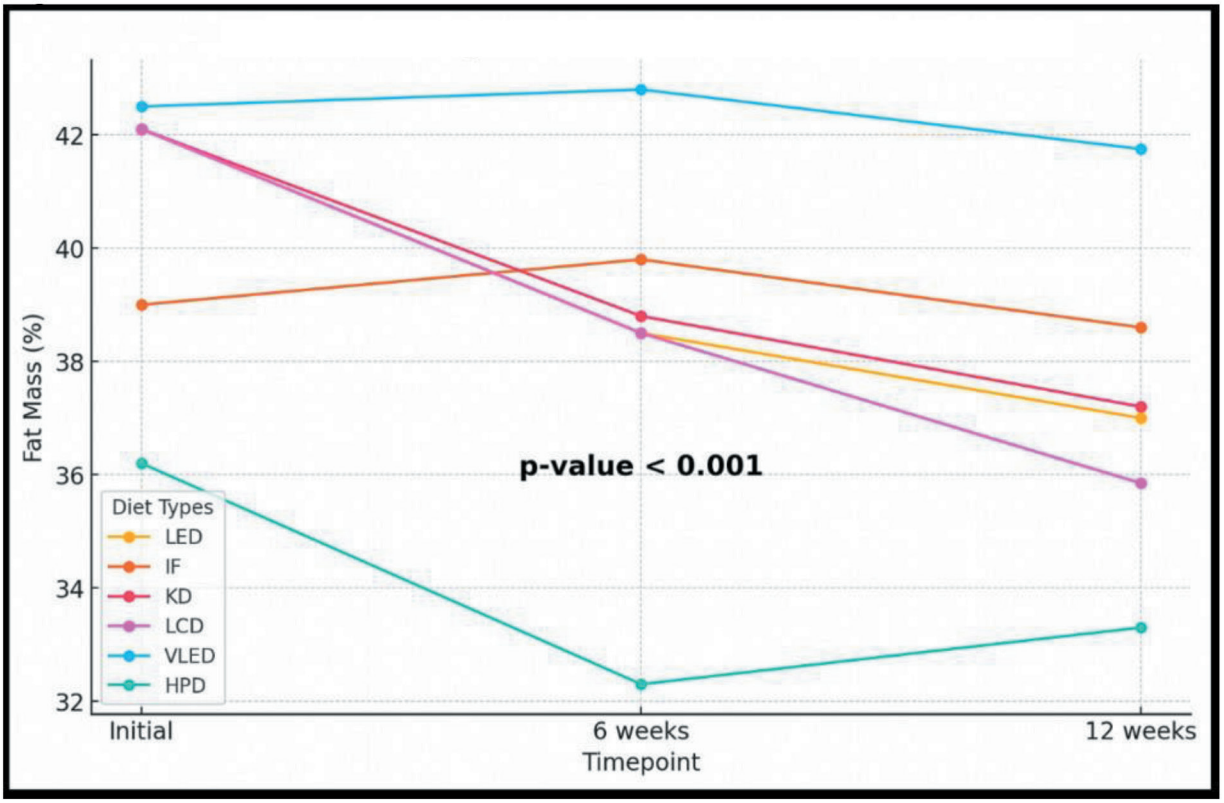


Fig. 1. Fat mass changes across different diets over time.

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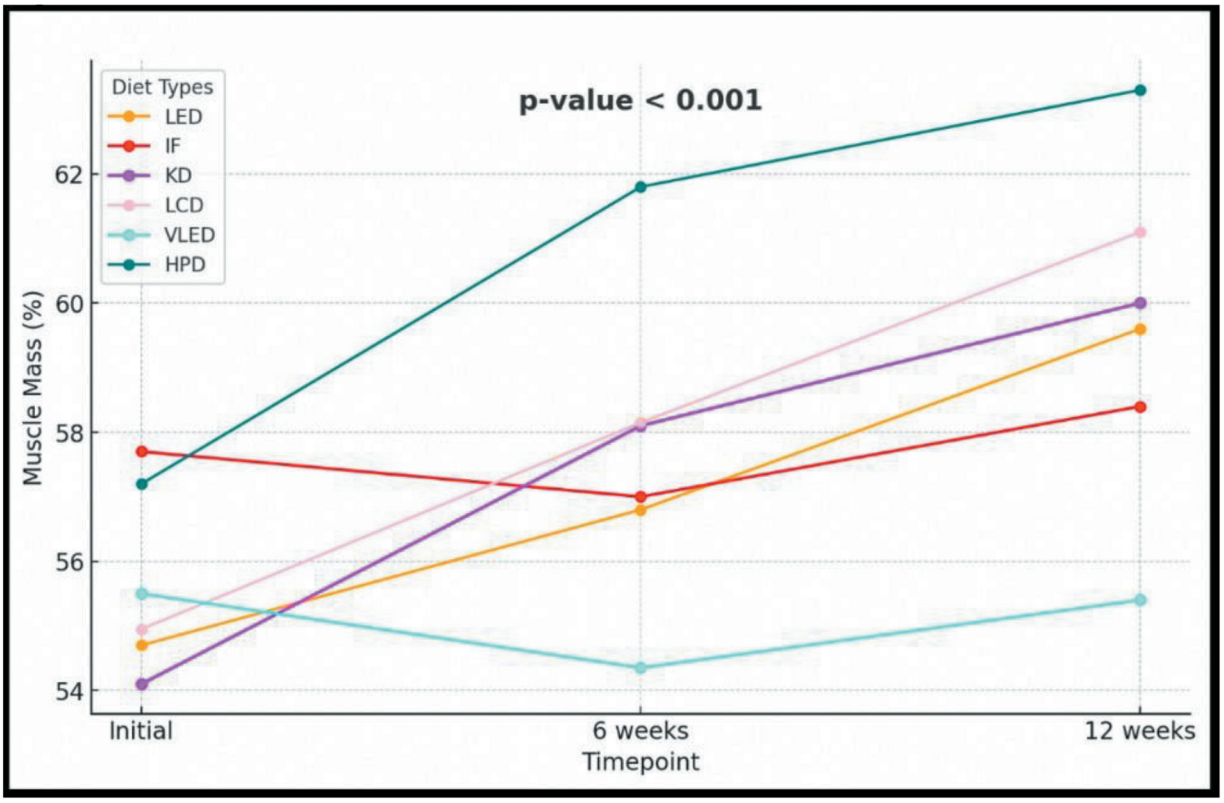


Fig. 2. Muscle mass changes across different diets over time,

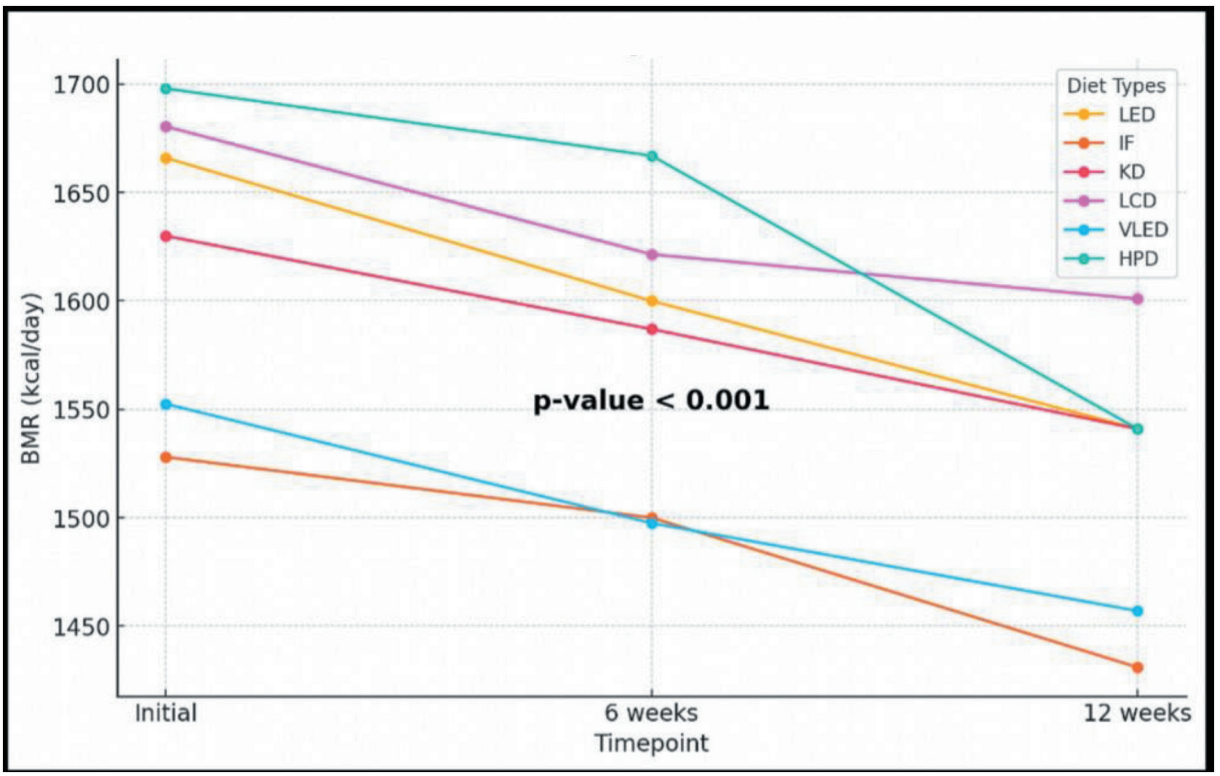


Fig. 3. Basal metabolic rate changes across different diets over time.

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PO4.025

Comparative Analysis of Dietary Habits and Obesity Prediction: Body Mass Index Versus Body Fat Percentage Classification Using Bioelectrical Impedance Analysis

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Introduction: Obesity remains a widely debated issue, often criticized for the limitations in its identification and classification. This study aims to compare two distinct systems for classifying obesity: body mass index (BMI) and body fat percentage (BFP) as assessed by bioelectrical impedance analysis (BIA). By examining these measures, the study seeks to clarify how different metrics of body composition influence the identification of obesity-related risk factors.
Methods: The study enrolled 1255 adults, comprising 471 males and 784 females, with a mean age of 36 ± 12 years. Participants exhibited varying degrees of weight status, including optimal weight, over-weight, and obesity. Body composition analysis was conducted using the TANITA Body Composi-tion Analyzer BC-418 MA III device (T5896, Tokyo, Japan), evaluating the following parameters: current weight, basal metabolic rate (BMR), adipose tissue (%), muscle mass (%), and hydration status (%).
Results: Statistically significant differences were identified between the groups of participants with overweight and obesity and the control group in terms of the evaluated categories ($p<0.001$) in both proposed models (BMI versus BFP), with minor exceptions. For specific conditions and health issues based on BMI classification, differences were observed in the onset of menopause in women ($p<0.001$) compared to the model based on adiposity where no differences were recorded ($p=0.15$). Different predictors were noted between the two evaluated models. Age was identified as a risk factor for obesity only in the BMI model (OR: 1.08, CI: 1.03–1.13, $p=0.004$). Several psychological factors were predictors for obesity only in the BMI model and did not impact adiposity: craving (OR: 17.08, CI: 4.82–68.55, $p<0.001$), fatigue (OR: 16.90, CI: 5.20–64.03, $p<0.001$), stress (OR: 42.07, CI: 12.70–172.12, $p<0.001$), compulsive eating (OR: 32.93, CI: 10.16–128.04, $p<0.001$), and nibbling (OR: 4.37, CI: 1.19–17.04, $p=0.029$). Having a family history of diabetes exhibited different effects in the two models; it was protective in the BMI model (OR: 0.33, CI: 0.11–0.87, $p=0.032$) but increased risk in the BFP model (OR: 1.66, CI: 1.01–2.76, $p=0.046$). The comparative analysis of the BMI and BFP models reveals notable differences in their predictive performance for obesity. The BMI model demonstrates exceptional predictive ability, with an AUC of 0.998

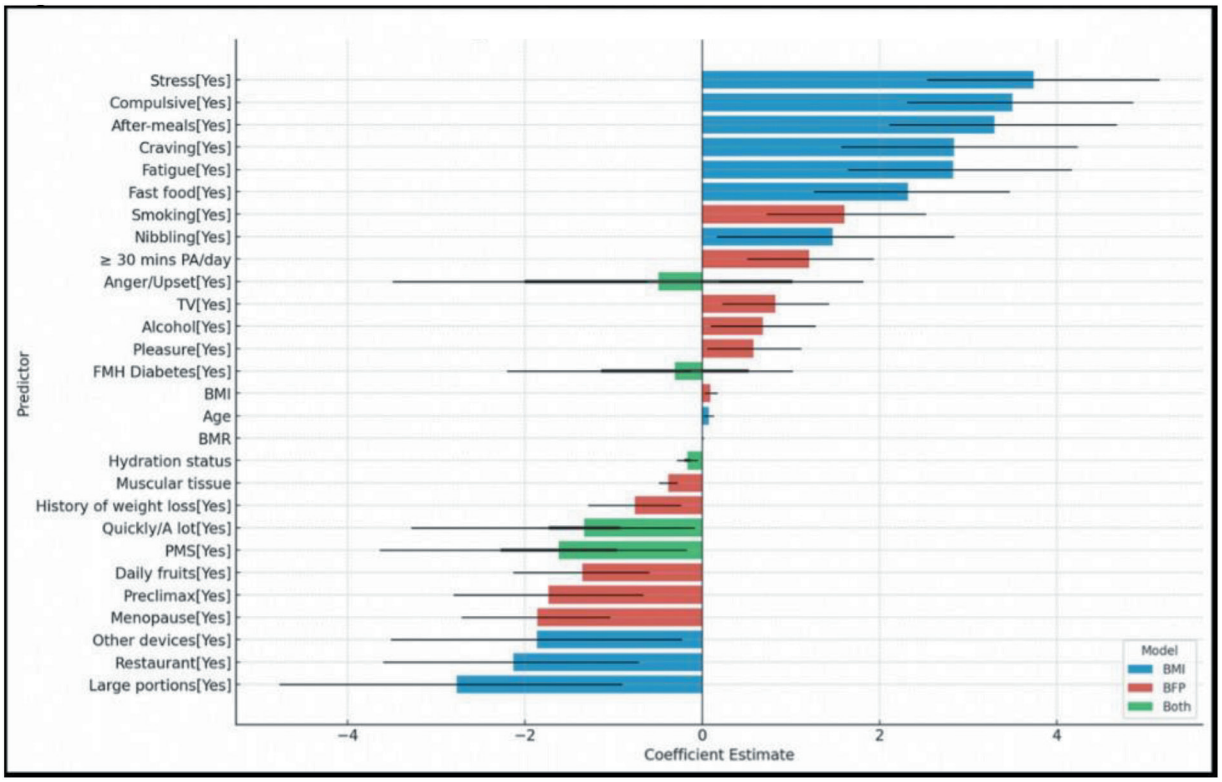


Fig. 1. Significant risk factors for BMI and BFP models.

Abbreviations: BMI—body mass index; BMR—basal metabolic rate; PMS—premenstrual syndrome.

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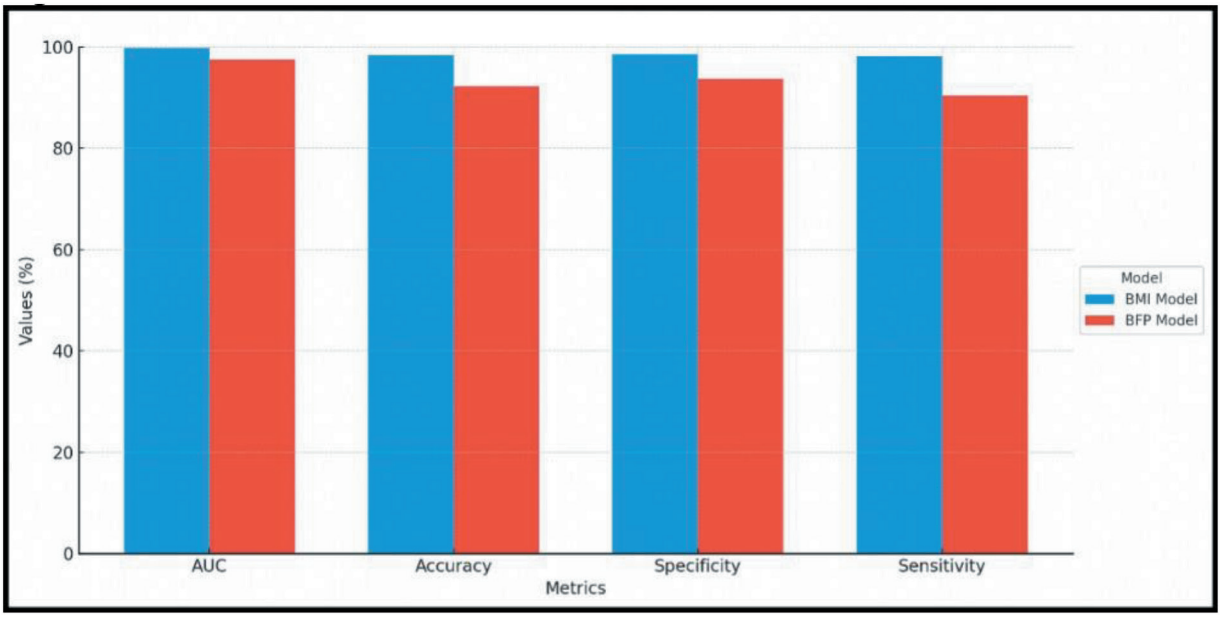


Fig. 2. Comparison of BMI and BFP models.

Tab. 1. Comparison between BMI and BFP models.

Model	AUC	95% CI	Accuracy	Specificity	Sensitivity
BMI	0.998	0.996-0.999	0.983	0.985	0.982
BMF	0.975	0.967-0.982	0.922	0.937	0.904

(95% CI: 0.996 - 0.999). In contrast, the BFP model, while still performing well, exhibits a lower AUC of 0.975 (95% CI: 0.967 - 0.982), indicating slightly reduced discriminative power compared to the BMI model.
Conclusions: While both the BMI and BFP models exhibit strong performance in predicting obesity, the BMI model demonstrates superior predictive accuracy, specificity, and sensitivity. This suggests that BMI remains a more reliable measure for identifying obesity-related risk factors compared to the BFP model.

PO4.026

Development of a Comprehensive Risk Prediction Model for Arterial Stiffness Assessment in Individuals with Obesity

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Introduction: Obesity in adults is a known risk factor for cardiovascular events and is associated with a decline in arterial elasticity. This study aims to evaluate the utility of pulse wave analysis (PWA) parameters in routine clinical practice for the primary prevention of cardiovascular events by developing a prediction model for arterial stiffness among individuals with obesity and overweight.
Methods: The study enrolled 84 adult patients, aged 18 to 85 years, with varying degrees of weight status, including optimal weight, overweight, and obesity. The lifestyle habits, the personal and family history of cardiometabolic diseases, as well the clinical evaluation that included BMI (body mass index), WHR (waist-to-hip ratio), WC (waist circumferance) were performed. PWA evaluation was conducted using the Mobil-O-Graph device, assessing the following parameters: pulse wave velocity (PWV), augmentation index (AIx), heart rate (HR), central pulse pressure (cPP), peripheral and central blood pressure (SBP, DBP, cSBP, cDBP). Body composition analysis was performed using the TANITA BC-418 body analyzer. Laboratory results from the past three months were also collected during initial nutritional consultations for each patient.
Results: Family history of cardiovascular events showed positive correlations with all PWA parameters, while diabetes history only with PWV and family history of obesity with PWV, DBP, cSBP. Insufficient sleep duration showed positive associations with all arterial stiffness parameters except cDBP. Smoking status correlated with significantly elevated PWV and Aix values, while insufficient physical activity was associated solely with PWV. Positive correlations were showed between current weight and PWV, while WC demonstrated positive associations with PWV, SBP, and cSBP. Body composition analysis revealed significant associations between trunk adipose tissue mass (%) and PWV, SBP, and cSBP. Hydration status (%) emerged as an independent predictor for PWV, exhibiting an inverse relationship. HOMA-IR (Homeostatic Model Assessment for Insulin Resistance) showed a strong positive correlation with PWV. Negative associations were observed with HDL-c and vitamin D. Threshold values for age, cDBP and Cardiac Index providing positive diagnostic for vascular impairment.
Conclusion: The assessment of arterial stiffness can be considered a reliable approach to prevent obesity-related cardiovascular events and facilitate the comprehensive management of such pathologies.

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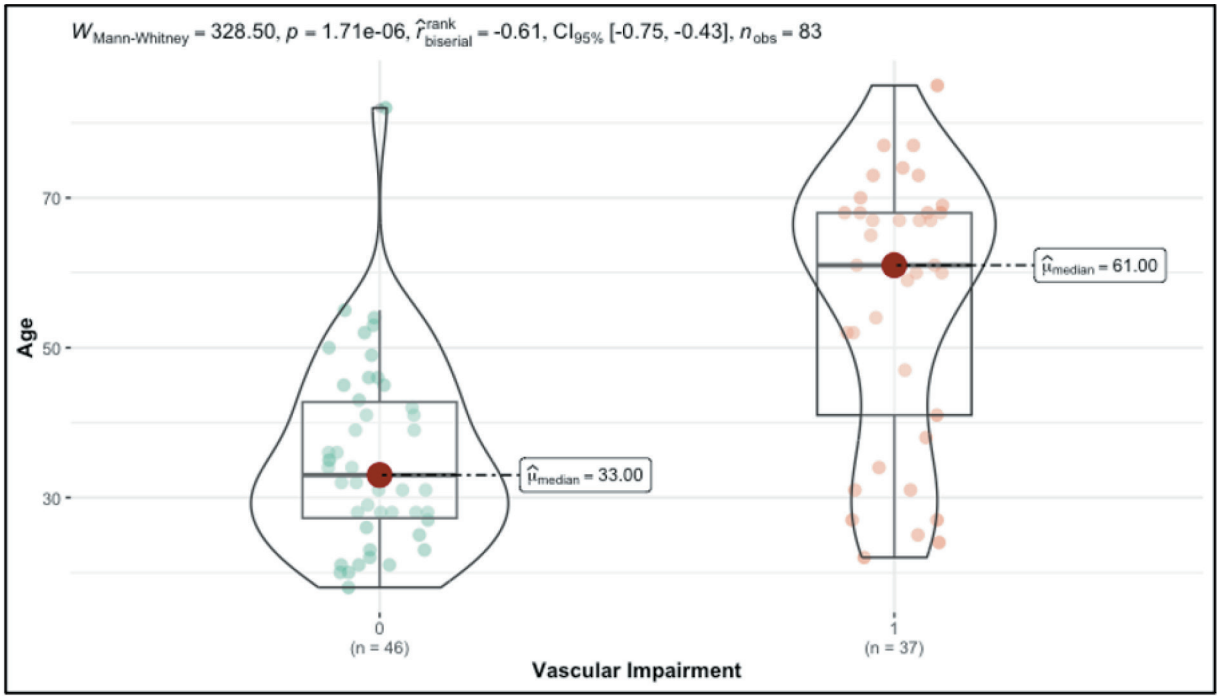


Fig. 1. Comparison of Age Distribution between Vascular Impairment and Non-Impairment Groups.

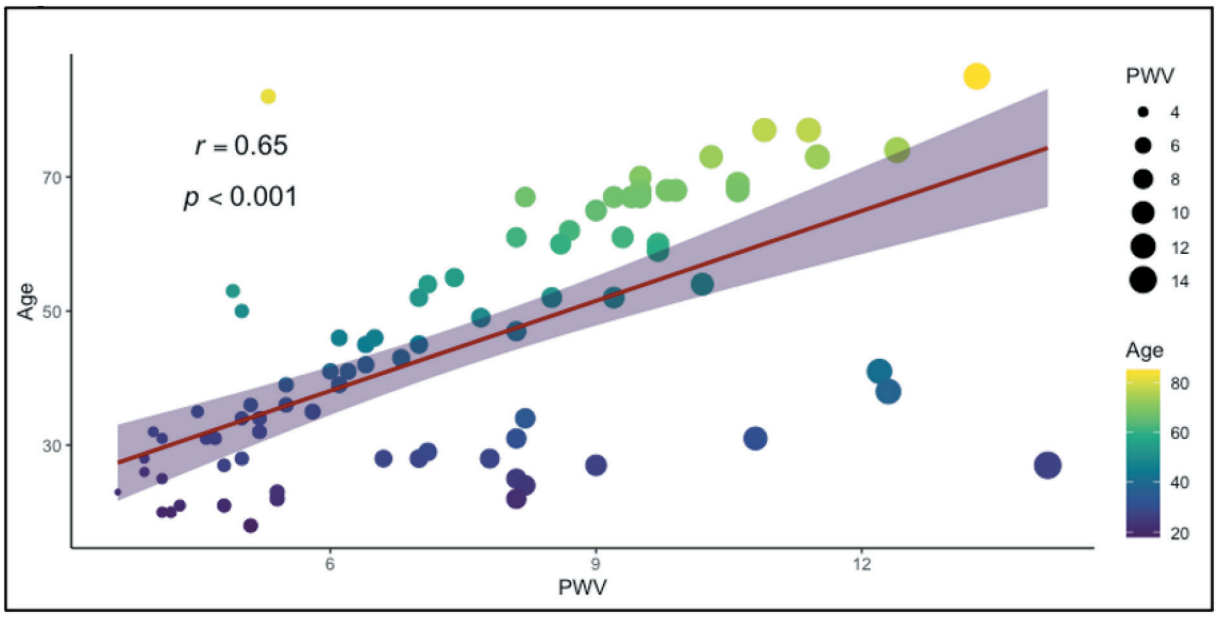


Fig. 2. Relationship Analysis: PWV and Age Correlation.

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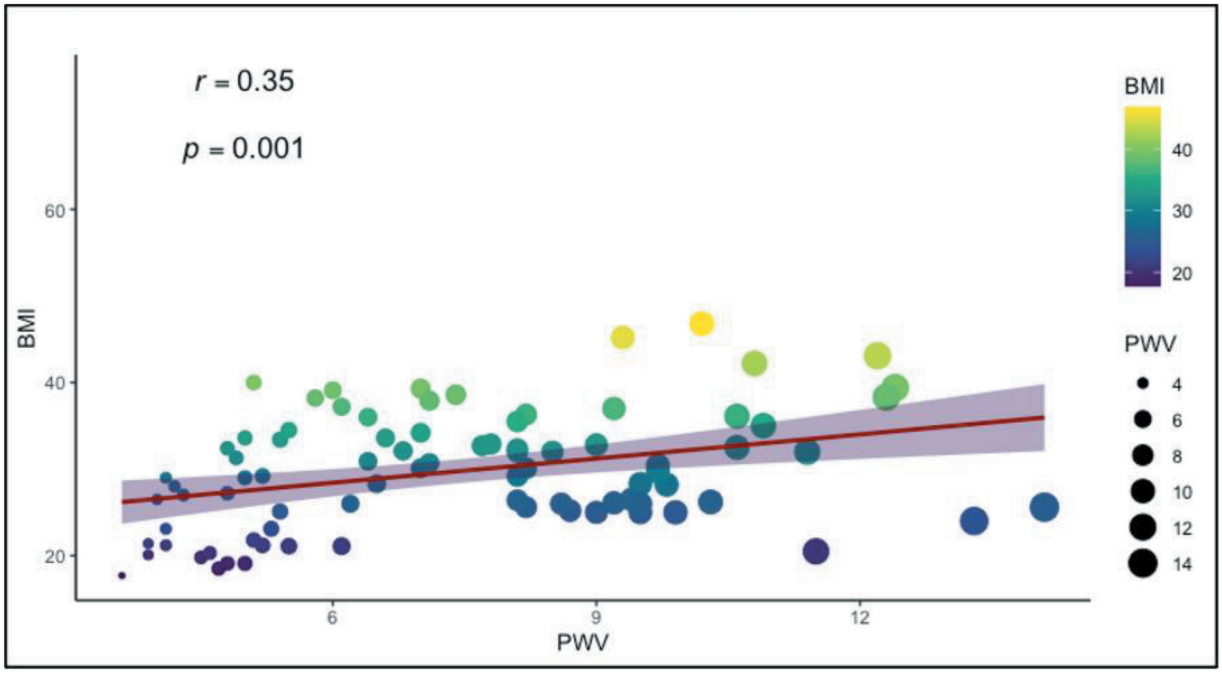


Fig. 3. Relationship Analysis: PWV and BMI Correlation.

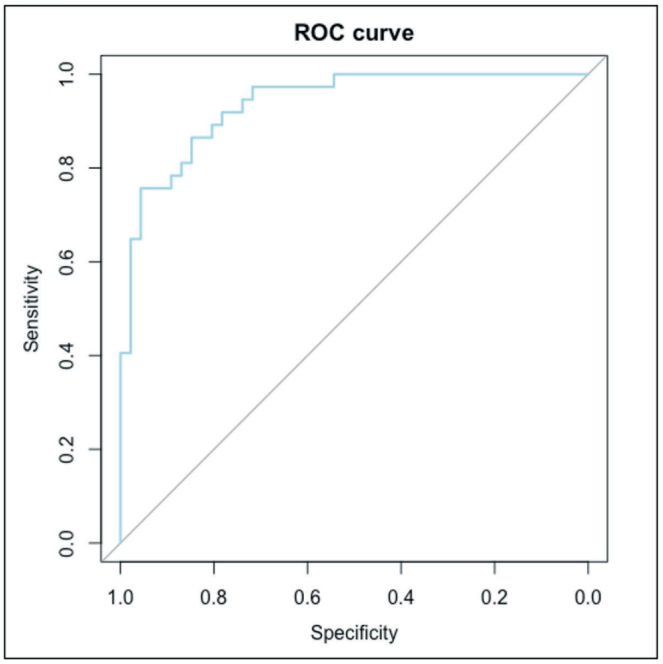


Fig. 4. ROC curve for the 3-factors logistic regression model

Tab. 1.

PREDICTORS	ESTIMATES	CI	p-value
AGE	1.09	1.05-1.14	<0.001
CDBP	1.05	1.05-1.14	0.034
CARDIAC INDEX	3.36	1.35-9.82	0.014
NAGELKERKE'S R	0.541		

Independent risk factors for vascular impairment using multiple logistic regression

Tab. 2.

AUC (CI-DeLong)	0.875 (0.799-0.950)
Sensitivity	70.27%
Specificity	95.65%
Accuracy	84.33%
p-value	<0.001
Age threshold value	32 years
CDBP threshold value	69 mmHg
Cardiac Index threshold value	2.38

AUROC Analysis of the 3-factors model

PO4.027

Significance of nutritional interventions in patients with metabolic syndrome

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Lifestyle changes, especially dietary habits, are the main therapeutic strategy for the treatment and management of metabolic syndrome
Specific dietary modifications, such as improving food quality or changing nutrient distribution, have shown beneficial effects on metabolic syndrome and its individual parameters.
Most evidence supports the use of the Mediterranean diet and DASH as a new paradigm for the prevention and treatment of metabolic syndrome.
Energy-restricted dietary patterns and increased physical activity are key to ameliorating the metabolic disturbances observed in patients with metabolic syndrome.

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PO4.028

Weight and behavior Management in a Patient with Smith-Magenis Syndrome: Role of GLP-1 Receptor Agonists

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Introduction: Smith-Magenis Syndrome (SMS) is a rare genetic disorder characterized by intellectual disability, behavioral abnormalities, sleep disturbances, and a high prevalence of obesity. Managing obesity in SMS is particularly challenging due to a combination of metabolic disturbances, hyperphagia, and behavioral dysregulation, often requiring complex behavioral and pharmacological interventions. The use of GLP-1 receptor agonists, such as semaglutide, presents a potential therapeutic option, though their application in SMS remains under-explored.
Case Presentation: We present the case of a 25 year old patient diagnosed with SMS when she was 8 years of age. Since her early childhood she struggled with severe weight gain and developed significant obesity-related complications, including type 2 diabetes, dyslipidemia, and early signs of Metabolic dysfunction–associated steatotic liver disease (MASLD). Initial management with dietary interventions, and lifestyle modifications was insufficient to control her weight during her childhood. At age 18 she joined a therapeutic patient education program for weight loss, incorporating psychological, dietary, physical activity and pharmacological management. She was started on injectable once weekly semaglutide, which led to a significant improvement in her weight control and behavior. Her impulsivity and food cravings decreased markedly. This improvement in behavioral and emotional regulation was notable, as impulsivity and hyperphagia are hallmark challenges in SMS. However, due to a shortage of injectable semaglutide, the patient was switched to the oral formulation. This transition resulted in a marked deterioration in her condition, with a relapse of violent behavior, increased food intake, and heightened anxiety, all of which negatively impacted her social interactions. Her weight also increased during this period. Once injectable semaglutide became available again, the patient was switched back which once again stabilized her behavior and halted further weight gain. She has since maintained a stable weight, with significant improvements in her impulsivity and social interactions.
Discussion: This case highlights the potential benefits of higher doses and injectable GLP-1 receptor agonists in managing both obesity and behavioral symptoms in patients with SMS. However, it also underscores the need for further research, particularly in understanding why the injectable form of semaglutide proved effective in this patient, while the oral form did not. Differences in pharmacokinetics, absorption, and systemic availability may account for the varying outcomes, suggesting that not all formulations of GLP-1 agonists may work equally well in patients with syndromic obesity.
Conclusion: GLP-1 receptor agonists, especially the injectable form, show promise in the management of obesity and impulsivity in SMS. Nevertheless, the variable response between oral and injectable formulations highlights the need for personalized treatment approaches and further research to optimize pharmacological strategies for managing obesity in SMS and similar syndromic conditions.

PO4.029

Optimization of cardiorespiratory exercise parameters in patients with obesity in a view to individualize targeted metabolic training

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[2]Department of Metabolic physiology and nutrition University Hospital of Batna Algeria

Introduction: Our aims is to evaluate two types of metabolic exercise tests in patients with obesity in order to optimize rehabilitation parameters within the framework of individualized targeted metabolic retraining.
Methods: In our case series, two exercises testing were carried out in 21 patients with obesity BMI≥30 kg/m2. The first was carried out by measuring cardiorespiratory capacities (VO2 max and HRmax) on an ergocycle using a gas exchange device. The second test was carried out in the same population on an ergocycle by measuring HRmax using heart rate monitors. The same parameters (VO2max and HRmax) were estimated by formula [VO2max = load (watts)/weight (Kg) measured by both tests. We compared all the obtained results of the exercises in order to identify if is there any difference between parameters.
Results: 21 women, aged 41.47 ±12 years, weight=93.43±14.87 Kg, BMI=36.87±5.73 Kg/m2. Predicted HRmax=178±9 bpm, measured HRmax=151±17 bpm. The predicted VO2max=32.65 ml/kg/min, the estimated VO2max=16.15 ml/kg/min (49% of the predicted value) and the measured VO2max=16.48 ml/kg/min (50% of the predicted value). Parametric tests did not find significant differences (p>0.05) between measured and estimated cardiorespiratory capacities.
Conclusion: Our work supports that the evaluation of respiratory (VO2max) and cardiac (HRmax) parameters in a clinical setting can be carried out by direct measurement or indirectly if specialized equipment is not available.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.030

Effects of body composition on the cardiorespiratory capacities in patients with obesity

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Introduction: Excess weight can impair both cardiometabolic and mechanical functions. Our aims is to study the effects of body composition on cardio-respiratory capacities in patients with obesity.
Methods: Our study concerned patients with obesity (BMI≥30Kg/m2). Body composition analysis was carried out by bioelectric impedancemetry. It allowed us to identify the total fat mass (TFM) and the total lean mass (TLM) in Kg and as a percentage. Cardiorespiratory capacities, oxygen consumption rate (VO2max), max heart rate (HRmax) and metabolic equivalent task (MET) were assessed using an ergocycle, for a maximal exercise test. The correlations between body composition and cardiorespiratory capacities were sought.
Results: 21 women, average age 41.12±12 years, BMI=36.87±5.7Kg/m², weight=93.43±14.87kg including TFM 44.99±6 kg, 62%. The HRmax was 150±15bmp, the VO2max was 16.48±2.08ml/Kg/min. Negative and statistically significant correlations were found between VO2max and BMI (rs= - 0.45, p=0.03), TFM in % (rs= - 0.61, p=0.003) and MET (rs= - 0.48, p=0.02). TFM in Kg is inversely correlated (rs= -0.43) with VO2max but not significantly (p=0.05). Likewise, HRmax is inversely correlated (rs= -0.71) with age and in a highly significant manner (p=0.000).
Conclusion: The accumulation of fatty tissue in inversely in our series seems to negatively influence cardiorespiratory capacities. Fat mass as a percentage provides better information on the evolution of VO2max. In addition to age, this category of obese seems to present a limitation in effort that must be taken when prescribing an appropriate physical activity.

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PO4.031

Examining the Effect of an Obesity Suit Role-Playing Exercise on Weight Bias and Empathy in Nutrition Students

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[3]Independent Researcher, Luzit, Israel
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Background: Addressing weight bias in registered dietitians should start during their education. This study assessed the impact of an obesity-suit role-playing exercise on weight bias and empathy among nutrition sciences students.
Methods: A quasi-experimental design ('one-group pretest-posttest design') was used with 34 first-year nutrition sciences students. Participants wore an obesity simulation suit and engaged in a standardized scenario with an actor portraying a registered dietitian, which illustrated various levels of weight bias and inappropriate equipment. Surveys, including the Anti-Fat Attitudes Questionnaire (AFA), the short form of the Fat-Phobia Scale (FPS), Weight Implicit Association Test (Weight-IAT), and Jefferson Scale of Empathy (S-version), were administered at baseline, and 1- and 3-weeks post-intervention. Demographic and weight history data were collected at baseline.
Results: A total of 34 students participated in the study, with a median age of 24 years; 70.6% were women. The mean scores for the Weight-IAT and FPS decreased over time ($p<0.001$ and $p=0.053$, respectively). In contrast, the mean scores for AFA or the Jefferson Scale of Empathy (S-version) remained stable throughout the study period ($p=0.877$ and $p=0.960$, respectively). While not statistically significant, the AFA 'fear of fat' subscale showed an increasing trend (3.46±0.39, 3.66±0.42, 3.91±0.46 at baseline, and 1- and 3-weeks post-intervention, $p=0.293$), whereas the 'willpower' subscale demonstrated a decreasing trend (4.40±0.34, 3.82±0.30, 3.81±0.35 at baseline, and 1- and 3-weeks post-intervention, $p=0.081$).
Conclusions: An intervention involving an obesity suit and simulation scenario reduced implicit weight bias and fat-phobia scores among nutrition sciences students. However, no significant changes were observed in overall anti-fat attitudes or empathy. Notably, trends toward increased 'fear of fat' and decreased 'willpower' subscale scores suggest complex shifts in attitudes that require further research exploration.

PO4.032

Weight management discussion in real-world GP-patient consultations: A qualitative analysis in Australian general practice

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Introduction: While primary care is positioned to be best suited to deliver weight management healthcare, the highly individualised patient experience of obesity, coupled with the difficult and intricate nature of communicating obesity healthcare messages in appropriate and non-stigmatising ways, makes the role of a GP increasingly complicated even before a patient even decides to engage with any obesity healthcare options. This study aimed to explore discussion strategies used in real-world GP-patient consultations when discussing obesity.
Method: Secondary data analysis of Australia's first, and only, Digital Library video recorded consultations was used. Fourty-seven consultations and patient post-consultation satisfaction surveys were analysed using descriptive content analysis with seventeen consultations discussing weight in some manner. A multi-disciplinary research team, including lived experience experts and practicing GPs, identified three overarching themes for how weight was discussed.
Results: 15/17 discussions about health in relation to weight were GP initiated and 2/17 were patients initiated. Fourteen used a structured approach (all GP initiated), while three used an opportunistic approach (one GP and two patients initiated). GPs raised the concept of weight in a patient-autonomous way, asking for consent to discuss weight as part of their routine care, or giving space for the patient to decline discussion. Weight was always positioned as a factor in relation to another presenting health concern of the patient and was discussed in positive, encouraging ways that were relative to each individual patient's health context.
Conclusions: This study of naturally occurring GP-patient consultations highlighted the intricacies of ways the delicate topic of weight was approached in consultations. While there was no overt discourse or behaviour from patients to indicate obesity stigma was present in these consultations, potentially stigma could have been internalised or perceived by patients. With the majority of weight discussions initiated by GPs in structured ways in these consultations, future research could look to develop specific evidence based non-stigmatising obesity related discussion prompters for GPs to refer to in their practice for flexible consistency with the range of patients seen. This could help empower GPs with confidence to discuss weight in consultations and ensure potential covert stigma is minimised. Any future communication resources for GPs should be co-designed with obesity lived experience experts to ensure appropriateness and avoidance of potential stigma and harm.

Conflict of Interest: No conflict of interests

Funding: The research was funded by the Royal College of General Practitioners, Australia (2018 Family Medical Care Education and Research (FMCER) Grant). Funding for the NCHA Digital Library was received through the National Centre for Healthy Ageing (NCHA). The NCHA acknowledges the support provided through the Commonwealth Department of Health and Aged Care through the Community Health and Hospitals Program.

PO4.033

Cardiometabolic outcomes based on weight reduction in participants treated with tirzepatide: post hoc analyses from SURMOUNT-OSA trials

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Introduction: The relationship between obstructive sleep apnoea (OSA) and cardiometabolic (CM) health is actively being studied, with current evidence supporting a bidirectional link. In the SURMOUNT-OSA program, tirzepatide reduced apnea-hypoxia index (AHI), hypoxic burden, body weight (BW), and blood pressure in participants with moderate-to-severe OSA and obesity. This study aims to evaluate the improvement in CM parameters in participants treated with tirzepatide based on their overall BW reduction.
Methods: The SURMOUNT-OSA (NCT05412004) program included two double-blind, randomized, placebo-controlled Phase 3 clinical trials that included participants with moderate-to-severe OSA (AHI ≥ 15) and obesity (body mass index ≥ 30 kg/m2) to determine the efficacy and safety of once-weekly tirzepatide at the maximum tolerated dose (10 mg or 15 mg) for 52 weeks. In this program, Study 1 and 2 included participants not on and on positive airway pressure (PAP) therapy, respectively.
For these post hoc analyses, tirzepatide-treated participants were divided in two groups: those who experienced < 20% BW reduction by Week 52, and those who experienced ≥ 20% BW reduction. Changes in CM parameters including systolic blood pressure (SBP), diastolic blood pressure (DBP), fasting serum glucose (FSG), serum insulin, and lipids (triglycerides, HDL-C, non-HDL-C, and LDL-C) were evaluated at Week 52 in the modified-intention-to-treat population (randomized participants having received at least 1 dose of study drug) excluding data after premature discontinuation of study drug, as well as any Study 1 data after PAP therapy initiation.
Results: At baseline, Study 1 participants had higher mean insulin concentration (Table). Participants who experienced <20% BW reduction

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at Week 52 had higher baseline triglycerides in both studies, and higher baseline insulin in Study 1.

At Week 52, all tirzepatide-treated participants experienced significant changes from baseline in CM parameters, except LDL-C that was not significantly decreased in Study 1 participants with < 20% BW reduction (Table).

In Study 1 and Study 2, at Week 52, participants who experienced ≥ 20% BW reduction had greater reductions in SBP, FSG, insulin, and triglycerides than participants who experienced < 20% BW reduction. In Study 2 only, participants who experienced ≥ 20% BW reduction had a greater increase in HDL-C than participants who experienced < 20% BW reduction. In Study 1, and, to a lesser extent, in Study 2, participants who experienced ≥ 20% BW had greater reductions in non-HDL-C and LDL-C than participants who experienced < 20% BW reduction.

Conclusion: These post hoc analyses suggest that, in participants with moderate-to-severe OSA, regardless of concomitant PAP therapy, tirzepatide treatment was associated with meaningful improvements in cardiometabolic parameters in both analyzed BW reduction categories. Improvements in cardiometabolic parameters appeared to be more pronounced in participants with higher BW reduction. This suggests that aiming for greater BW reduction may better modulate cardiometabolic disease risk in people with moderate-to-severe OSA and obesity.

Tab. 1. Baseline values and change from baseline to Week 52 in cardiometabolic parameters in participants from Study 1 and Study 2 according to body weight reduction percentage group.

Cardiometabolic parameter	Study 1 Tirzepatide-treated participants not on PAP therapy		Study 2 Tirzepatide-treated participants on PAP therapy	
	< 20% BW reduction N = 64	≥ 20% BW reduction N = 48	< 20% BW reduction N = 65	≥ 20% BW reduction N = 53
SBP				
Baseline (mmHg)	128.3 (11.8)	128.0 (12.2)	131.4 (13.6)	129.8 (15.1)
Week 52 (absolute change from baseline)	-7.2 (1.4)***	-11.2 (1.5)***	-6.9 (1.3)***	-11.1 (1.2)***
DBP				
Baseline (mmHg)	84.6 (7.3)	82.6 (10.6)	83.3 (8.4)	83.1 (7.8)
Week 52 (absolute change from baseline)	-3.7 (1.2)**	-3.5 (1.2)**	-4.1 (1.0)***	-4.4 (1.1)***
FSG				
Baseline (mmol/L)	5.6 (1.0)	5.7 (1.0)	5.6 (0.86)	5.5 (0.44)
Week 52 (absolute change from baseline)	-0.71 (0.063)***	-0.92 (0.066)***	-0.63 (0.077)***	-0.85 (0.047)***
Insulin				
Baseline (mU/L)	40.4 (93.3)	30.0 (23.8)	20.7 (14.8)	22.2 (16.2)
Week 52 (percent change from baseline)	-34.6 (5.4)***	-58.8 (3.4)***	-32.0 (6.0)***	-59.1 (3.2)***
Triglycerides				
Baseline (mg/dL)	204.4 (222.1)	153.0 (71.6)	168.9 (77.2)	155.5 (67.7)
Week 52 (percent change)	-30.0 (4.1)***	-36.9 (2.5)***	-28.1 (2.8)***	-42.4 (2.9)***
HDL-C				
Baseline (mg/dL)	43.2 (11.7)	45.4 (8.7)	43.2 (9.2)	43.7 (8.8)
Week 52 (percent change from baseline)	11.3 (2.4)***	10.9 (2.2)***	8.7 (2.6)**	23.8 (3.2)***
Non-HDL-C				
Baseline (mg/dL)	154.4 (47.1)	150.7 (39.6)	148.4 (34.4)	152.8 (30.6)
Week 52 (percent change from baseline)	-11.4 (3.5)**	-20.6 (2.4)***	-15.2 (2.2)***	-18.2 (2.4)***
LDL-C				
Baseline (mg/dL)	117.4 (41.4)	120.1 (36.3)	114.6 (33.2)	122.2 (26.2)
Week 52 (percent change from baseline)	-4.0 (4.3)	-15.7 (3.1)***	-10.4 (2.6)***	-11.8 (2.5)***

Data is presented as mean (SD) for baseline values and least square mean (LS) estimate (SE) for change unless otherwise mentioned. * p<0.05, ** p<0.01, *** p<0.001 from baseline The least square mean (LSM) change from baseline was calculated within each weight reduction group using a mixed model for repeated measurements (MMRM) with Baseline value, Geographic Region, Baseline OSA Severity Group, Sex, Time as the fixed effect and patient as random effect. Abbreviations: BW, Body weight; DBP, Diastolic blood pressure; FSG, Fasting serum glucose; HDL-C, High-density-lipoprotein-cholesterol; LDL-C, Low-density-lipoprotein-cholesterol; LSM, Least-square of mean; PAP, Positive airway pressure; SBP, Systolic blood pressure; SE, Standard error

PO4.034

Perceptions and Attitudes Toward Obesity Management: A Survey of Healthcare Professionals in a Tertiary Care Setting in Dubai

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Objectives: This study aims to explore physicians' perspectives on obesity within tertiary care centers in Dubai, UAE, which include Centers of Excellence in obesity management.

Introduction: Obesity is highly prevalent in the Middle East, particularly in the United Arab Emirates. In recent years, healthcare professionals have increasingly focused on treating obesity as a chronic disease to prevent obesity-related comorbidities and reduce cardiovascular morbidity and mortality.

Methods: A questionnaire survey was distributed via email to all healthcare professionals working in private hospitals in Dubai, UAE. The survey assessed respondents' knowledge, attitudes towards obesity, and their confidence in managing obesity.

Results: A total of 63 responses were collected, with participants representing a wide range of specialties, including surgeons, anesthesiologists, primary care physicians, internists, endocrinologists, and others. Dieticians comprised the largest subgroup, accounting for 14% of respondents. Notably, 25% of participants reported that over 50% of their practice involved patients with obesity, while 50% encountered such patients less frequently. Remarkably, 80% of respondents felt comfortable addressing weight-related concerns. Opinions on the causes of weight gain were varied, with participants citing factors such as lack of motivation and willpower, insufficient knowledge about healthy lifestyles, genetic predisposition, and the balance of caloric intake versus physical activity. Furthermore, 48% expressed a desire for further education in obesity management, 34% had received some form of training, and 25% indicated no need for additional learning.

Conclusion: On a background of significant prevalence of obesity in the region, our study reflects the confidence of healthcare professionals in addressing this issue, as well as their willingness to enhance their knowledge and skills in obesity management.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.035

Glucagon-like peptide-1 receptor agonists versus bariatric metabolic surgery and obesity-related cancer

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Introduction: Both obesity and diabetes were associated with increased risk for specific types of cancer, generally termed Obesity Related Cancer (ORC). Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and bariatric metabolic surgery (BMS) are well established treatments, but their comparative effectiveness for the prevention of ORC is unknown. Therefore, this study's objective was to compare the incidence of ORC in adults living with obesity and diabetes who were treated with first-generation GLP-1RA or with BMS.

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Methods: An observational, retrospective cohort study based on electronic medical records data of Clalit health services, which insures 52% of the Israeli population (approximately 4.8 million patients insured persons). The study included patients aged ≥24 years, living with obesity and diabetes, with no prior history of ORC, who received either of the interventions during 2008 through 2018. Overall, 3,440 couples were matched 1:1 based on sex, age, baseline BMI, time of treatment initiation, and smoking status. The study period extended from January 2008 until December 2023. The main outcome was the incidence of ORC, defined as any of the following diagnoses: multiple myeloma, meningioma, adenocarcinoma of esophagus; stomach, colorectal, liver or bile duct, gallbladder, pancreas, corpus uteri, ovary, renal-cell kidney, thyroid, and postmenopausal breast cancer.
Results: Of the 6,880 study participants, 4,236 (61.6%) were females. At baseline, the median age was 53 years, and the median BMI was 40.6 kg/m2. ORC occurred in 6.70 cases per 1,000 person-years in BMS patients, and in 6.64 cases per 1,000 person-years in GLP-1Ra patients; adjusted HR for GLP1-RA versus BMS 1.01 (95% CI: 0.83-1.25). Further adjustment for the percent of maximal BMI change during follow-up depicted the relative advantage of GLP1-RA compared to surgery beyond weight-loss: adjusted OR for GLP1-RA versus BMS 0.73 (95% CI: 0.56-0.95).
Conclusion: This study demonstrated a similar incidence of ORC among patients treated with first-generation GLP-1RA and with BMS, despite the relative advantage of surgery in maximal weight reduction. Accounting for this advantage, revealed GLP1-RA to be 27% more effective for the prevention of ORC. New generation, highly potent GLP1-RAs with higher efficacy in weight reduction may convey a greater advantage in cancer prevention.

Conflict of Interest: Drs Dicker, Lavie, and Reges reported receiving grants from the Israel Science Foundation outside the submitted work. Dr Dicker reported receiving grants, personal fees, and non-financial support from NovoNordisk and Eli Lilly; and personal fees and non-financial support from Boehringer Ingelheim outside the submitted work. No other disclosures were reported.

Funding: No financial or in-kind support was provided for the conduct of this study.

PO4.036

Maximizing outcomes: synchronizing liraglutide and tailored exercise in weight loss - a case study

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Obesity, especially with central adiposity, poses complex health risks requiring comprehensive intervention for effective management. This case study explores a 51-year-old man with a 20-year history of obesity, who experienced repeated weight loss failures through diet and exercise alone. At presentation, he reported a BMI of 36.2 kg/m², alongside symptoms of fatigue, joint pain, and difficulty with physical activities due to excess weight. Initial clinical examination revealed normal blood pressure and heart rate and ruled out comorbidities such as hypothyroidism and Type 2 diabetes, supported by a standard metabolic panel. Exercise testing demonstrated a VO2 Max of 36.8 ml/kg/min and a VT VO2 of 17.6 ml/kg/min, confirming physical limitations yet potential for improvement. The patient was placed on a progressive liraglutide (Saxenda) protocol, titrated up to 3 mg daily, complemented by a customized exercise regimen totaling 300 minutes per week. The exercise program included a structured blend of aerobic activities, resistance training, and high-intensity interval training (HIIT) to optimize weight loss and functional gains. Over 17 weeks, the patient achieved a remarkable total weight loss of 29.5 kg, corresponding to a 32.5% reduction in body weight, significantly surpassing typical outcomes associated with liraglutide alone. His BMI improved from 36.2 kg/m² to 26.1 kg/m², with notable reductions in waist circumference and overall fat mass, as well as enhancements in cardiovascular endurance and musculoskeletal strength. He maintained full engagement in the exercise program without complications, evidencing the protocol's efficacy and tolerability.
This case highlights the substantial benefits of integrating pharmacological therapy with a tailored exercise regimen in managing obesity. The results suggest that personalized exercise can amplify the effects of liraglutide, fostering weight loss and improved physical capacity. The findings support a combined intervention approach for individuals with long-standing obesity who have struggled with lifestyle modification alone, underscoring the value of individualized, dual-modality treatment for achieving and sustaining weight loss while improving overall fitness and health outcomes.

PO4.037

Obesity impacts employment, work productivity, and quality of life in real-world settings in Europe, the United States, and Australia

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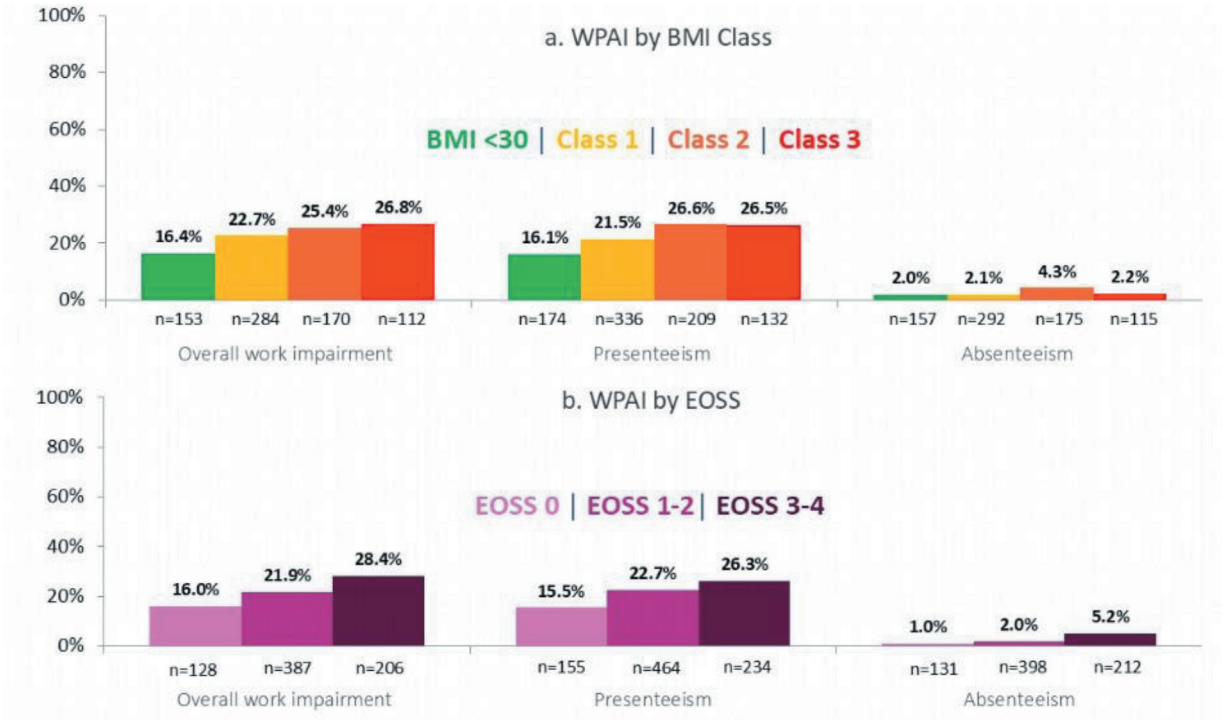
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Introduction: The global economic impacts of obesity are due to reach ~$4.3 trillion annually by 2035 [1]. Lower work productivity and decreased economic growth due to lost workdays, disability, and mortality are among the many contributing factors [1]. These impacts are also partly driven by stigma and discrimination individuals with obesity often face in society, which can create additional barriers to participation and opportunity. Productivity losses are twice as high for people with obesity than for people without obesity over a lifetime [2]. This study assessed the impact of obesity on work productivity and quality of life (QoL) in 7 real-world settings using data from the Adelphi Real World Obesity Disease Specific Programme™ (DSP).
Methods: Observational study based on data from the DSP; a cross-sectional survey with retrospective data capture from October 2023 to April 2024 in France, Germany, Italy, Spain, United Kingdom, United States (US), and Australia. Physicians provided data for the first 8 consulting people meeting selection criteria (at data capture/previous body mass index (BMI) ≥30 kg/m2 or BMI ≥27 kg/m2 with at least one obesity-related complication; weight management program at data capture; 18+ years). Participants had a diagnosis of overweight/obesity, but BMI at data capture may not indicate overweight/obesity. Participants completed voluntary forms including the Work Productivity and Activity Impairment (WPAI) questionnaire measuring lost productivity and impairment due to obesity and related complications (0-100%; higher scores indicate greater impairment), and the 36-Item Short Form Health Survey (SF-36v2) measuring QoL [3]. SF-36 T-scores <47 indicate impairment. Descriptive analyses were conducted on participant self-reported data by disease severity at data capture: BMI (<30; Class I: 30-<35; Class II: 35-<40; Class III: ≥40), and the Edmonton Obesity Staging System (EOSS) (Stage 1=pre-clinical risk factors, 2=established complications, 3=end organ damage, 4=end stage) [4].
Results: 1414 participants were analysed. At data capture, 60% were female, mean age 49.7 years. Average years since diagnosis was 5.1, with 63% diagnosed with Class I-II obesity, mean of 2.6 complications, and 53% classified with EOSS stage 1-2 at data capture. 60% were employed full-time, while 13% were out of employment due to obesity, with an average of 2.6 years not working. Overall activity impairment increased with BMI and EOSS, with high impacts observed in BMI Class III (47%) and EOSS 3-4 (43%). Among those employed, overall work impairment and presenteeism generally increased with BMI and EOSS. SF-36v2 scores also indicated worsening quality of life with high BMI and EOSS.
Conclusions: Real-world data from Europe, the US, and Australia underscore the significant negative impact of obesity on employment status, work productivity, and QoL as disease severity increases. Findings highlight the need for timely and improved obesity management to minimise impacts and improve health and social inequities.

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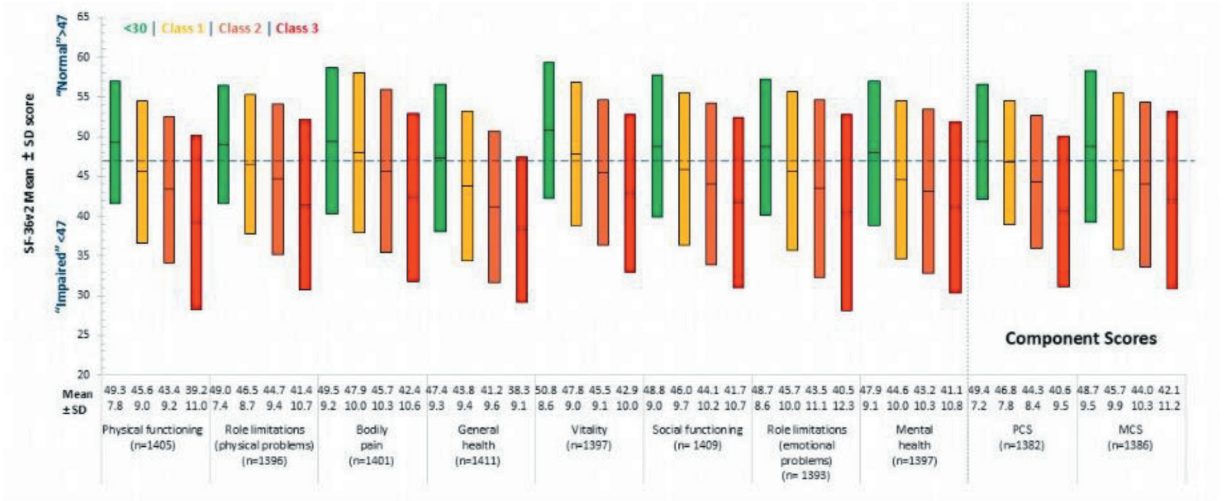
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Abbreviations: BMI, Body Mass Index; EOSS, Edmonton Obesity Staging System; PwO, People living with obesity; WPAI, Work Productivity and Activity Impairment Questionnaire

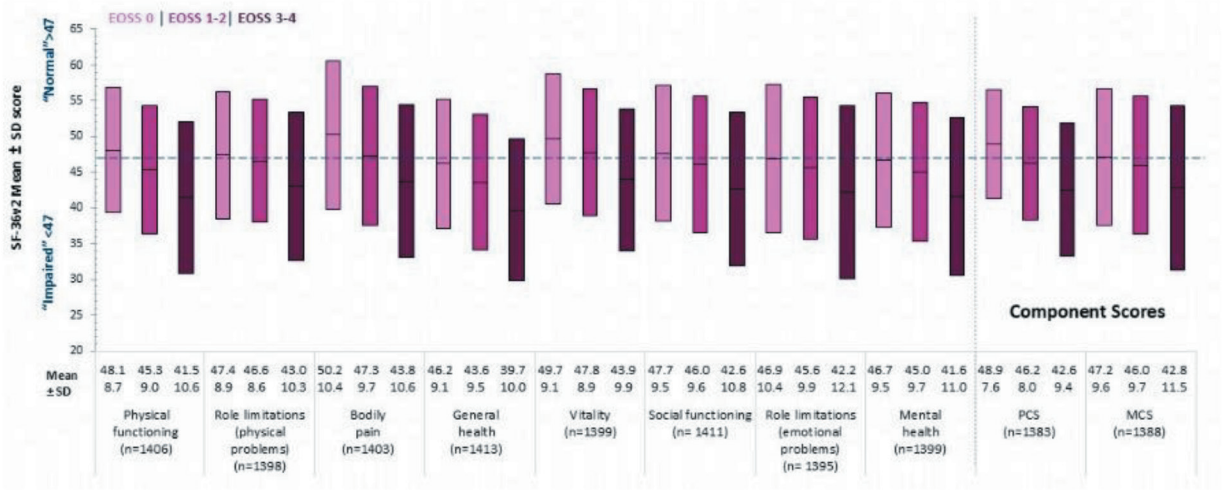
Fig. 1. Work productivity in PwO measured using WPAI: (a) by BMI and (b) by EOSS.



Note: Norm based scores reported. T-scores between 47–53 are considered within the "normal" range for the general population where scores of <47 are considered indicative of impairment in the specific domain. Abbreviations: BMI, Body mass index; EOSS, Edmonton Obesity Staging System; IQR, inter-quartile range; MCS, mental component score; PCS, physical component score; PwO, people living with obesity; SF-36v2.0®, Short Form 36 Quality of Life Questionnaire.

Fig. 2a. Quality of life impact in PwO by BMI, measured by SF-36v2.

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Note: Norm based scores reported. T-scores between 47–53 are considered within the "normal" range for the general population where scores of <47 are considered indicative of impairment in the specific domain. Abbreviations: BMI, Body mass index; EOSS, Edmonton Obesity Staging System; IQR, interquartile range; MCS, mental component score; PCS, physical component score; PwO, people living with obesity; SF-36v2.0®, Short Form 36 Quality of Life Questionnaire.

Fig. 2b. Quality of life impact in PwO by EOSS, measured by SF-36v2.

PO4.038

Laying the Foundations for the Development of a Digital Behavioral Intervention Adjunct to Incretin-Based Medications for Obesity: Preliminary Findings from Patients Interviews Pilot

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Background: Incretin-based obesity medications offer a promising approach to obesity management. However, they also present challenges, such as muscle mass loss and changes in diet quality, which may affect health outcomes sustainability. Tailored behavioral interventions are needed to support lifestyle modifications, however, data on the components required to optimize behavior change in this context are limited. This initial qualitative work is part of a project aimed at developing a digital behavioral intervention that supports dietary and physical activity modifications as adjuncts to incretin-based obesity pharmacotherapy.
Methods: Drawing on behavioral change theories and patient-centered care principles, this study employed a qualitative descriptive design using semi-structured interviews. Five participants receiving incretin-based obesity pharmacotherapy for up to six months were sampled through social media. Virtual interviews via Zoom lasted approximately 30 minutes and were guided by an interview protocol. Open-ended questions explored: (1) key factors affecting patients' ability to adopt healthy lifestyle habits during medications treatment, and (2) participants' needs and preferences for adjunct behavioral interventions to support these modifications. Content analysis using an abductive approach was performed, aimed at informing subsequent interviews, targeting a final sample of 50 participants to achieve theoretical saturation and inform the intervention development in the following project's phase.
Results: Preliminary analysis revealed three interconnected themes: (1) Navigating Healthcare Support and Access to Care - Participants emphasized the need for comprehensive healthcare support, a multidisciplinary approach, and increased availability of specialized care. Virtual consultations were seen as a potential solution, with a preference for a blended format of virtual and in-person to balance convenience and connection; (2) Importance of Personalized Care - Participants highlighted the need for care tailored to individual preferences, dietary restrictions, and unique side effects impacting eating patterns. Ongoing individual support was preferred over general group sessions. Lifestyle modifications posed distinct challenges, with some struggling with cravings or exercise barriers, underscoring the need for approaches that consider each patient's unique circumstances; (3) Psychological and Emotional Support Framework - Participants highlighted the psychological and emotional aspects of the weight loss journey, with body image and self-perception as significant concerns. Emotional eating and the relationship with food were central challenges, and social stigma further impacted lifestyle behaviors and adopting new patterns.
Conclusion: These preliminary findings underscore the importance of a flexible, personalized intervention model addressing both practical and psychological needs of patients using incretin-based obesity medications. This pilot will guide the continuation of this phase, laying the groundwork for a digital intervention aimed at supporting sustainable behavior change and optimizing patient's health outcomes.

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PO4.039

Lifestyle, Mental Health and Physical Status among People with Overweight and Obesity

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Introduction: Overweight and obesity occur when excess fat accumulation increases the risk of adverse health outcomes. Overweight is defined as a body mass index (BMI) of ≥25 kg/m², and obesity as a BMI of ≥30 kg/m². The aim of this research was to investigate lifestyle factors, mental health, and physical status among Lithuanian overweight and obese adults.

Methods: A cross-sectional correlational research strategy was applied to assess the relationship between BMI and various lifestyle factors, as well as physical and mental characteristics in a group of 135 individuals (50 overweight and 85 obese; 42 men, 93 women, aged 25–55 years). Body composition, lung vital capacity, and muscle strength were measured using dynamometry and ergometry (anaerobic lactate and glycolytic capacity), along with an orthostatic test. Sleep quality was evaluated using the Pittsburgh Sleep Quality Index (PSQI), stress levels with the Perceived Stress Scale (PSS), and mindfulness with the Mindful Attention Awareness Scale (MAAS). Data analysis was performed using SPSS 27.0 software.

Results: The results show an association between physical status (lower aerobic capacity) and higher BMI ($p<0.05$). Women's physical indicators (lung vital capacity, $p=0.001$; anaerobic power, $p=0.001$) were lower than men's, while blood lactate concentration was higher after the aerobic performance test ($p=0.022$). BMI was significantly associated with increased systolic ($p=0.002$) and diastolic blood pressure ($p=0.002$) at rest in all participants. In the group of obese women, BMI showed a significant association with blood pressure and a higher waist-to-hip ratio compared to the men's group ($p<0.05$). Univariate logistic regression analysis revealed no significant association between BMI and mental health factors, including perceived stress ($p=0.957$), sleep quality ($p=0.171$), or mindfulness ($p=0.829$). Together, these mental health factors explained only 0.4% of the variation in BMI.

Conclusion: No significant associations were found between BMI and mental health. The influence of psychological factors on body weight may be indirect or emerge only beyond a certain threshold. In the obese women's group, BMI was negatively correlated with physical capacity indicators and positively with the waist-to-hip ratio. Across all participants, a significant correlation was observed between higher BMI and increased blood pressure, especially in women. The findings indicate a trend toward central obesity and metabolic syndrome, which heightens the risk of cardiovascular disease. Future research could focus on designing and implementing targeted exercise interventions to improve lifestyle factors and explore the specific mechanisms linking BMI to mental health.

Conflict of Interest: None to declare.

Funding: No funding to report.

PO4.040

Limited Weight Regain From Nadir Weight in SURMOUNT-1 3-Year Study

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Introduction: Obesity management is a long-term journey during which fluctuations in body weight are expected to occur. For some patients, a previous nadir weight can become a point of focus. However, there is not clear literature that nadir weight is clinically relevant. This post hoc analysis of the SURMOUNT-1 3-year study aimed to assess the magnitude of weight regain from nadir weight over 176 weeks with tirzepatide treatment.

Methods: This analysis included 690 tirzepatide-adherent participants (≥75% doses received) with obesity or overweight and prediabetes in the SURMOUNT-1 3-year study who had at least 5% weight reduction at time of nadir weight (the lowest weight achieved during treatment). Weight regain from nadir to Week 176 was defined as the difference between percent weight reduction from baseline to nadir and percent weight reduction from baseline to Week 176. Weight regain analyses included mean percent and were categorized as <5%, 5% to <10%, and ≥10% weight regain. Analyses used efficacy analysis sets (on-treatment data in participants with ≥ 1 dose of study drug).

Results: At baseline, tirzepatide-treated participants had a mean age of 49 years, a weight of 107 kg, and a BMI of 38.6 kg/m2. The mean time to nadir weight was 22 months. The mean percent weight reduction at nadir weight was 23.1% (SD 10.2%). The mean percent weight regain from nadir weight to Week 176 was 3.7% (SD 4.3%) leading to a mean percent weight reduction of 19.4% (SD 10.8%) at Week 176. At Week 176, 73%, 19%, and 8% of participants treated with tirzepatide 5 mg (N=227) regained <5%, 5% to <10%, and ≥10% weight from nadir weight, respectively (Table). Similarly, 65%, 26%, and 9% of participants treated with tirzepatide 10 mg (N=239) experienced <5%, 5% to <10%, and ≥10% weight regain from nadir to Week 176, respectively. Among participants treated with tirzepatide 15 mg (N=224), 73%, 20%, and 7% experienced <5%, 5% to <10%, and ≥10% weight regain from nadir to Week 176, respectively.

Conclusion: This post hoc analysis found that 70% of participants treated with tirzepatide had limited (<5%) weight regain after nadir weight. Less than 10% of participants regained ≥10% from their nadir weight. Overall, these findings suggest that most participants receiving tirzepatide had a relatively stable weight journey over 3 years in the SURMOUNT-1 3-year study.

Conflict of Interest: L. J. Aronne reports receiving grants or personal fees from Altimmune, AstraZeneca, Boehringer Ingelheim, Eli Lilly and Company, ERX, Gelesis, Intellihealth, Jamieson Wellness, Janssen, Novo Nordisk, Optum, Pfizer, Senda Biosciences, and Versanis and being a shareholder of Allurion, ERX Pharmaceuticals, Gelesis, Intellihealth, and Jamieson Wellness.
I. Jouravskaya, D. Cao, N. A. Xavier, J. P. Dunn are employees and shareholders of Eli Lilly and Company.

Funding: Eli Lilly and Company

Tab. 1. Percentage of participants in the SURMOUNT-1 3-year study who experienced different levels of weight regain from nadir at Week 176 for each dose of tirzepatide.

Data are n (%)	% Weight regain from nadir to Week 176		
	<5%	5% to <10%	≥10%
Tirzepatide 5 mg (N=227)	165 (72.7)	43 (18.9)	19 (8.4)
Tirzepatide 10 mg (N=239)	156 (65.3)	61 (25.5)	22 (9.2)
Tirzepatide 15 mg (N=224)	163 (72.8)	45 (20.1)	16 (7.1)

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PO4.042

Sustaining Success - The effectiveness of a physiotherapy-led 12-week weight management intervention in the UK: a one-year follow-up

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Introduction: The World Obesity Federation refer to obesity as a relapsing progressive disease process, with the prevalence increasing globally. First line weight management interventions generally last for 12 weeks, with real-world lifestyle interventions typically resulting in short-term weight loss. To date there is a paucity of real-world long-term data in short term weight management interventions. We therefore aimed to investigate the long-term effectiveness of a 12-week weight management intervention on weight outcomes in people living with obesity.
Methods: Data was collected as part of routine evaluation of an ongoing NHS service, therefore ethical approval was not required. This project was registered in the trust's QI project database. An appropriately powered sample size was calculated to be 138 participants to detect small effect size changes.
The intervention consisted of 12 sessions of nutrition education and physical activity based on the COM-B model of behaviour change, delivered online or in-person. Self-reported body weight was collected at 4 time points: baseline, post programme (12 weeks), 6 months and 12 months following session 1. Eligibility criteria were age ≥18 years, body mass index ≥30 kg/m² for white ethnicity, and ≥27.5 kg/m² for all other ethnicities. Change in weight over each timepoint was analysed using a repeated measures ANOVA with a post-hoc analysis.
Results: 819 patients enrolled into weight management programmes between September 2020 – October 2023. Over 80% of patients were female (N=670), mean (± SD) age was 47.03 (±13.22), 65% lived in socially deprived areas. Mean starting weight was 99.37 kg (±15.58).
At least one session was attended by 76.7% of participants (N=628). The completion rate (patients who attended 75% of sessions or more) was 41.5% (N=340). Discharges accounted for 54.3% of participants (N=445), of which 92.4% were due to multiple 'did not attend' (N=411) and 7.6% self-discharged (N=34). Virtual programmes accounted for 90% of patients (N=736).
In total, 17.5% of participants (N=143) had weight data at all four time points and were included for analysis. There was a significant effect for time with a small effect size (P = 0.037, η_p^2= 0.059). Weight outcomes were 97.93 kg (±15.58), 96.69 kg (±14.87), 96.91 kg (±15.60) and 97.25 kg (±16.86) at baseline, post programme, 6 months and 12 months, respectively. A Bonferroni pairwise comparison showed that there was a significant reduction in weight from baseline to post-programme (p=0.025), with no significant differences between any other timepoints (p>0.05).
Conclusion: This study presents real-world longitudinal data in participants living with obesity following a 12-week lifestyle intervention. Over 12 months, participants exhibited weight maintenance. Although data may be skewed by survivorship bias, in the context of obesity as a chronic, progressive, relapsing condition, weight maintenance following a short intervention is advantageous and represents a successful outcome. Non-weight related outcomes such as physical activity behaviours and overall health status should also be examined at 12-month follow-up in future research.

PO4.043

Apolipoprotein E genetic how predictor in obese people

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Background: Currently questions on the role of genes polymorphism that regulate metabolism and implicated in metabolic disorders are disputed. Objective. The study of proteomic and metabolomic manifestations of different variants of apolipoprotein E genes polymorphism in boese people.
Methods: The study involved 217 obese people. All the patients underwent genotyping of polymorphic sites c.388 (T>C) c.526 (C>T) of the ApoE gene. Proteomic studies included the determination of the content of adipokines (adiponectin, resistin, apelin and visfatin), cytokines (IL-6, TNFa, IL-1a), CRP and fatty acids L-FABP, annexin V. Assessment of metabolomic markers was based on a study of the lipid profile.
Results: It was established that, with the ApoE genotypes ε3 / ε3 and ε2 / ε3 of the ApoE gene, the content of lipids and glucose in people with obesity was statistically significantly reduced, which indicated a high efficiency of diet therapy. In people with the genotypes ε2 / ε2 and ε4 / ε3, no such patterns were found. The most pronounced changes in lipid metabolism are revealed in carriers of C allele at position c.388 and T at position c.526 of ApoE gene (c.388 T/C+c.526C/T and c.388 T/C+c.526 T/T). In the course of the execution of the correlation analysis of metabolomic and proteomic markers 1SNP or absence of SNP (c.388 T/T+c.526 C/T or s.388 T/C+c.526 C/C) in ApoE gene was found to be accompanied with dyslipidemia and the initiation of inflammation. At 2 SNP in the ApoE gene (c.388 T/T+c.526 T/T and c.388 T/C+c.526 C/T), we have identified correlations of lipid metabolism markers and adipokines (adiponectin, visfatin). At 3 SNP we found the relationship between adipokines (apelin, visfatin, resistin) and pro-inflammatory cytokines (IL1a), annexin V and lipid metabolism markers.
Conclusion: The studied polymorphic genotypes may be used in the complex with the individual characteristics of energy metabolism, hormonal and immune status of the people preventive medical measures and the implementation of a personalized diet of obese people

PO4.044

Adiposity characteristics of women who developed gestational diabetes mellitus from individual participant data of diet and/or physical activity interventions in pregnancy

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Introduction: Weight management interventions during pregnancy typically consist of diet and/or physical activity components with the aim of reducing likelihood of pregnancy complications (e.g. Gestational diabetes mellitus; GDM). Interventions are typically targeted based upon pre- or early pregnancy Body Mass Index (BMI). However, alternative measures of assessing body fat (e.g. skinfold thicknesses/circumference measurements) may be better than BMI at predicting which women are at greatest risk of developing complications and who would benefit the most from intervention. This study compared adiposity measures for women who

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did and did not develop GDM using existing trial data to identify potential measures for targeting future interventions.
Methods: The International Weight Management in Pregnancy (i-WIP) collaboration has a living database of individual Participant Data (IPD) from RCTs of weight management interventions in pregnancy. IPD from trials that had data available on adiposity in early pregnancy (<16 weeks' gestation) and outcome data on GDM. Using these data, exploratory analysis of the standard care (control) group compared adiposity characteristics of women who developed GDM versus no GDM. Adiposity characteristics were calculated as mean (SD), with statistical significance tested (between women who did and did not develop GDM) using t-tests.
Results: GDM data were available for 2640 women (eight trials), within the control arm; 383 women developed GDM, and 2257 did not. Seven of eight trials recruited only women with overweight or obesity based upon BMI. Compared with women who did not develop GDM, women who developed GDM had significantly higher BMI (n= 2637,p<0.0001), height (n=2637 p<0.0001), bicep skinfold (n= 1591 p<0.0001), tricep skinfold (n= 1597 p<0.0075), subscapular (n= 1586 p<0.0001), mid-upper arm circumference (n= 2142 p<0.0001), new BMI (n= 2627, p<0.0001), thigh circumference (n=659 p<0.0205), relative fat mass (n= 843 p<0.0156) and waist-to-height ratio (n= 849, <0.0100).
Conclusion: This analysis indicated numerous potential adiposity measures, in addition to BMI, which could be used for targeting diet and/or physical activity weight management interventions in pregnancy. It is important to note that even in women who did not develop GDM the mean BMI was 31.94 kg/m2 (Standard Deviation (SD):5.84), and mean waist-to-height ratio was 0.65 cm/cm (SD: 0.23), which would be considered "high-risk" using current guidance. Future investigation in a larger dataset should include a broader range of BMI. Future research could develop pregnancy-specific adiposity cut-offs that are more appropriate to the physiological changes of pregnancy.

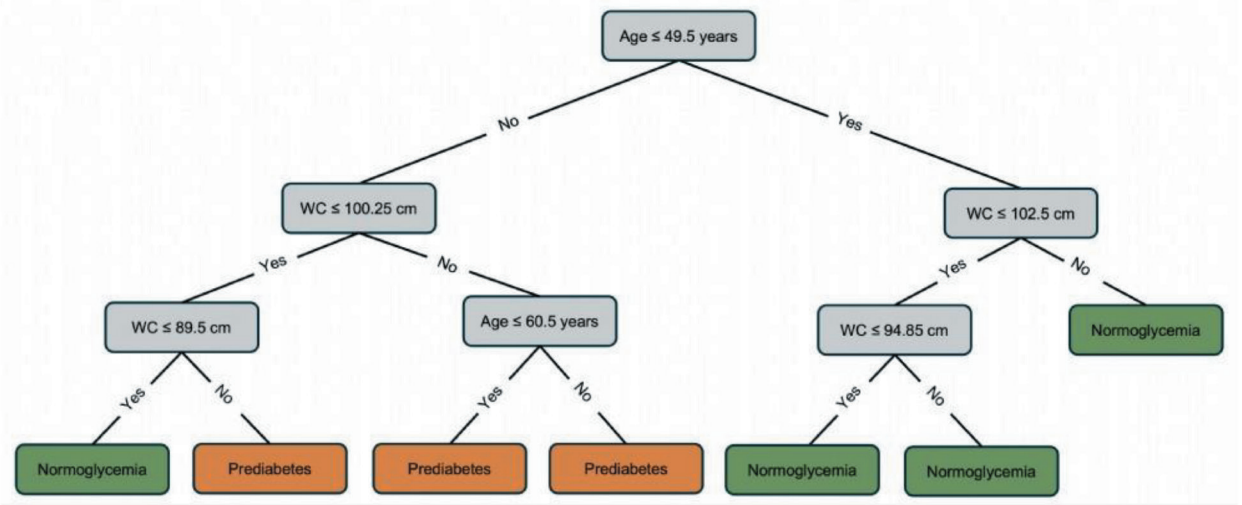
PO4.045

Developing a Simple Non-Laboratory Based Machine Learning Tool for Prediabetes Screening: Preliminary Results

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Introduction: Living with overweight or obesity are significant risk factors for developing T2D [1]. Prevention efforts target high-risk groups, including people with prediabetes - a condition with blood glucose levels above normal but not yet in the T2D range [2]. Prediabetes offers a chance for prevention [3]; hence, identifying prediabetes requires invasive and costly blood glucose tests, hindering widespread screening [3]. Non-laboratory machine learning tools using easily accessible data have the potential to facilitate broader screening with minimal costs associated. Therefore, this study aimed to develop a simple, non-laboratory machine-learning tool for prediabetes screening.
Methods: Data for model development originated from a prediabetes screening project in Denmark, involving 501 participants without prior T2D diagnosis. Demographic data and a hemoglobin A1c (HbA1c) were collected. Twelve potential features were extracted: age, gender, diastolic- and systolic blood pressure, BMI, body fat, waist circumference, known hypertension, blood pressure medication, family history of diabetes, smoking, and education level. For the target variable, participants were divided into prediabetes (HbA1c ≥39 mmol/mol) or normoglycemia (HbA1c <39 mmol/mol). The dataset was split 70/30 for training and validation. The most important features were identified through forward feature selection, and a decision tree model was trained, both within a five-fold cross-validation framework. Model performance was evaluated using the area under the receiver operating characteristics curve (ROC AUC).
Results: Out of 501 participants, 88 had prediabetes. Participants had a mean age of 49.78±15.52 years, a mean BMI of 27.15±5.28, and 55% were male. Age and waist circumference were selected as the most important features and were included in the model. Based on the decision tree, age was the primary factor in determining prediabetes (Figure 1). Three-fourths of end nodes for ages > 49.5 years were categorized as prediabetes (orange), while all end nodes for ages ≤ 49.5 years were categorized as



Starting at the top, the grey boxes contain the questions that lead a person to an end node, classified as either prediabetes (orange) or normoglycemia (green). WC, waist circumference.

Fig. 1.

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normoglycemia (green). The model achieved an ROC AUC of 0.8297 and 0.7961 on the training and validation dataset, respectively.
Conclusion: A simple machine learning screening tool was successfully developed to detect prediabetes. It can be easily implemented in practice, as it requires only the collection of two non-laboratory features. However, the model should be tested on additional data to ensure its generalizability and external validity.

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PO4.046

Exploring the acceptability of three time-matched exercise interventions for increasing fitness in women living with obesity: a mixed-methods evaluation of the EXOFFIT study

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Introduction: The EXOFFIT study compared the effectiveness of three time-matched exercise interventions in women with obesity for improving cardiorespiratory fitness. To best inform future research, evaluation of the interventions' acceptability is needed. Previous research has been inconsistent with methods and reporting of acceptability. Thus, the theoretical framework of acceptability (TFA) can be utilised to ensure all aspects of acceptability are evaluated. No study to date in women with obesity has utilised the TFA in conjunction with quantitative data (i.e. frequencies of themes) to highlight the aspects of interventions that may be most important for participants. This study aimed to examine the acceptability of the EXOFFITT programme and gain insight into the participants' experience of participation, their perspective on the acceptability of trial procedures and interventions and gather their feedback on programme changes.
Methods: A mixed-methods approach was employed. Thirty-eight participants who completed the exercise interventions were interviewed and completed a self-reported exit questionnaire. Interviews were transcribed verbatim and analysed in three phases: emergent themes were agreed upon, then mapped to the TFA constructs and the frequencies of each construct and theme were presented as counts. Data collected from the exit questionnaire were collated and reported using descriptive statistics.
Results: All seven TFA constructs were identified in the analysis. The EXOFFIT programme was found to have a high level of acceptability, with affective attitude, perceived effectiveness and self-efficacy being the most reported constructs. The burden and opportunity costs associated with the programme were mainly related to family commitments and support needed to participate. Any negative impact of participation was noted to be outweighed by the perceived benefits.
Conclusions: The results of this study will inform the development of future programmes with women with obesity and support the consideration of the TFA constructs from the outset of study design.

PO4.047

Safety, tolerability, and clinical effects of petrelintide: a long-acting amylin analog

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Introduction: Petrelintide is a novel amylin analog designed for once weekly (ow) subcutaneous (s.c.) administration in development for weight management. Previous tolerability and safety data, as well as body weight reductions, observed with single and multiple dosing even without dose escalation encouraged further investigations.
Methods: This randomized, double-blind, placebo-controlled, 16-week treatment, phase 1b trial assessed safety, pharmacokinetics, and pharmacodynamics of ow s.c. petrelintide in healthy participants with BMI 27-39.9 kg/m2. Forty-eight participants (79% male, median age: 49 yrs, BMI: 29 kg/m2, body weight: 92 kg) were randomized (3:1) within three dose cohorts. Dose escalation was used to reach target doses of 2.4 mg, 4.8 mg and 9.0 mg, administered for twelve, eight and six weeks, respectively.
Results: Petrelintide was well tolerated, with no serious or severe adverse events (AEs). All gastrointestinal (GI) AEs were mild (Figure 1), except for two moderate events (nausea and vomiting) reported in one participant who discontinued treatment; there were no other treatment discontinuations due to AEs (Figure 2). No other events of vomiting occurred

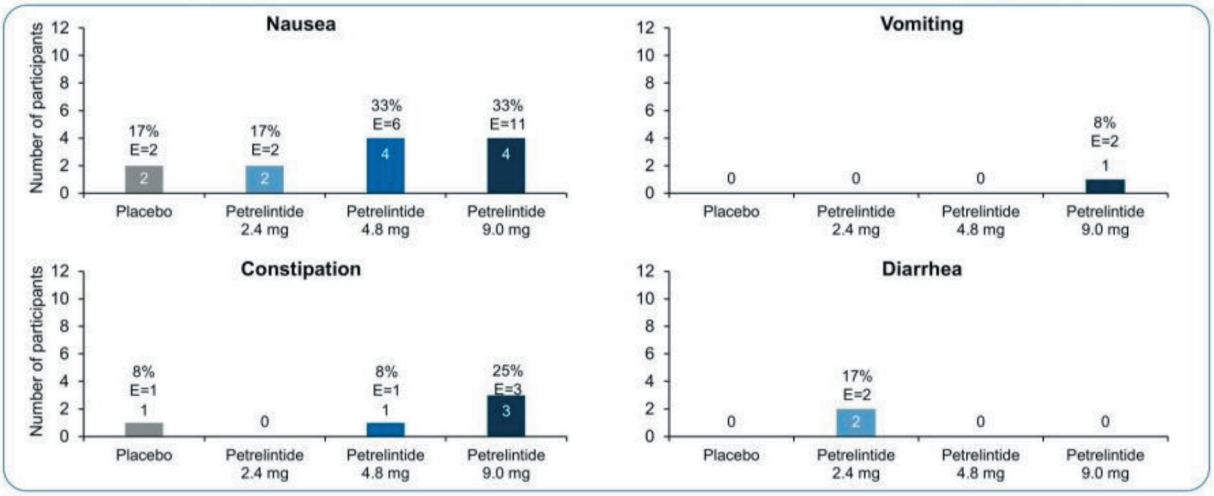
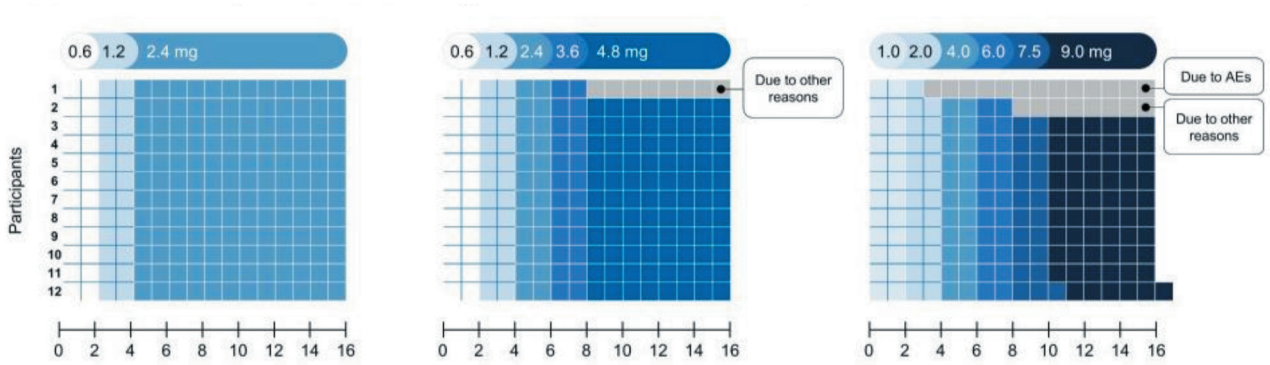


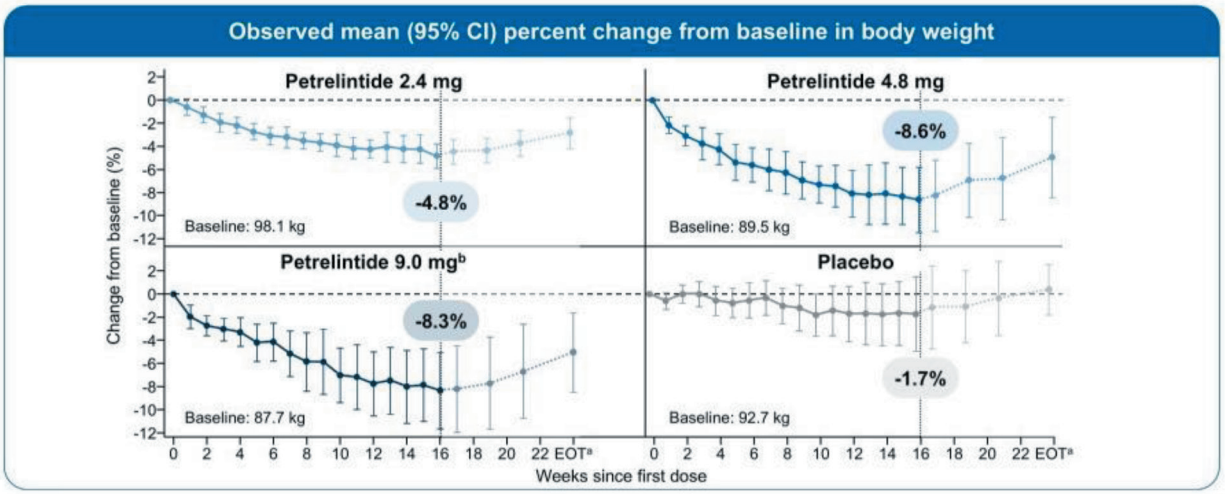
Fig. 1. Selected Gastrointestinal TEAEs: all GI TEAEs were mild, except for one event of moderate nausea and one event of moderate vomiting in a single participant. N=12 in each treatment group; E=number of events; N=number of participants; TEAE= treatment-emergent adverse events.

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Treatment completion and compliance with dose escalation within cohorts

Fig. 2. Treatment completion and compliance with dose escalation within cohorts: three participants discontinued petrelintide, one due to AEs (adverse event), two due to other reasons; one participant in the 9.0 mg arm had an extra week at 7.5 mg (due to tolerability); the remaining participants followed dose escalation steps within cohorts.



Change in body weight

Fig. 3. Change in body weight: observed mean (95% CI) percent change from baseline in body weight, EOT includes measurements at the EOT visit, performed at 24 or 25 weeks after dosing, and also performed for participants discontinuing treatment early. One participant had one extra week at 7.5 mg, and thereby only five weeks on maintenance dose at Week 16. After Week 16, this participant is included with weeks after last dosing. CI=confidence interval; EOT=end of trial.

and there were two events of diarrhea, both mild. Nausea was reported in 16.7-33.3% for petrelintide, vs. 16.7% for placebo. Two participants discontinued treatment for other reasons. Among treatment completers, all but one participant followed the dose escalation scheme across cohorts. No participants developed antidrug antibodies. The pharmacokinetic profile supports once-weekly dosing. After 16 weeks, mean body weight reductions were 4.8%, 8.6% and 8.3% (Figure 3), for the three petrelintide treated groups, respectively, versus 1.7% for pooled placebo.

Conclusion: Treatment with petrelintide appeared safe, was well tolerated, and resulted in clinically meaningful body weight reductions of up to 8.6% after 16 weeks. GI AEs were predominantly mild, transient in nature and occurred during dose escalation. These results underline the potential of petrelintide as an anti-obesity treatment, with efficacy comparable to GLP-1 receptor agonists but with better tolerability. The efficacy and safety of petrelintide is being investigated in phase 2 trials.

PO4.048

Effects of oral ingestion of *Lactococcus lactis* subsp. *lactis* CAB701 on body fat reduction in adults with overweight or obesity: a randomized, double-blind, placebo-controlled trial

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Introduction: Evidence suggests an association between changes in microbial diversity and composition and the development of obesity, raising the possibility of targeting gut microbiota for new anti-obesity therapies. A previous study found that *Lactococcus lactis* subsp. *lactis* CAB701 exerts anti-obesity effects by modulating key molecular markers and lipid profiles, positioning it as a promising candidate for addressing obesity and related metabolic disorders; however, to our knowledge, direct research

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examining its impact on body fat reduction in humans has not yet been conducted. In this study, we investigated the efficacy and tolerability of Lactococcus lactis subsp. *lactis* CAB701 for reducing body fat in Korean adults with overweight or obesity.

Methods: A randomized controlled trial was conducted on 100 adults with overweight or obesity (19% men, mean age 48.9 ± 13.9 years, BMI 25.8 ± 1.8 kg/m²). Participants received either 150 mg/day of Lactococcus lactis subsp. *lactis* CAB701 (intervention group, IG) or a placebo (control group, CG) for 12 weeks, with 93% completing the study. CAB701capsule contained ~10×10^{10} CFU/g as confirmed pre-trial. Body fat changes, assessed by DEXA, served as the primary endpoint, with secondary outcomes including body mass index, weight, body fat percentage, lipid profiles, adiponectin, and other metabolic markers. Adverse events were monitored, and the trial was registered under ClinicalTrials.gov Identifier: NCT06628791.

Results: This 12-week randomized controlled trial evaluated the efficacy and safety of Lactococcus lactis subsp. *lactis* CAB701 in reducing body fat among adults aged 19–75 years. In the per-protocol analysis(IG: n=47; CG: n=46), the IG showed a statistically significant reduction in the primary efficacy variable, body fat mass measured via DEXA (-0.87 ± 3.46 kg; $p < 0.05$) compared to the CG (+ 0.61 ± 1.12 kg). Secondary efficacy outcomes, including BMI (-0.41 ± 1.00 kg/m²; $p < 0.05$), body weight (-1.41 ± 3.90 kg; $p < 0.05$), and body fat percentage (-1.15 ± 3.53%; $p < 0.05$), also showed significant reductions in the test group compared to the control group, with adiponectin levels significantly increased (+1.92 ± 3.64 μg/mL; $p < 0.05$) compared to the control group (-0.57 ± 3.17 μg/mL). These results were consistent with findings from the intent-to-treat analysis (IG: n=50; CG: n=50). No serious adverse events related to Lactococcus lactis subsp. lactis CAB701 were reported, and safety assessments, including clinical laboratory tests, showed no safety concerns.

Conclusion: Lactococcus lactis subsp. *lactis* CAB701 significantly reduced body fat, BMI, weight, and fat percentage while increasing adiponectin levels over 12 weeks. This highlights its potential as a safe, effective intervention for managing body fat and metabolic health, warranting further studies in diverse populations.

PO4.049

Achieving Stringent BMI Control was Associated with Reduced Predicted Risk of Type 2 Diabetes in Chinese Adult Patients with Obesity/Overweight: A Post hoc Analysis of SURMOUNT-CN

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Introduction: SURMOUNT-CN (NCT05024032) is a phase 3 trial of Chinese participants with obesity/overweight without diabetes who were randomized to receive tirzepatide or placebo along with lifestyle interventions. This post-hoc analysis compared, at week 52, the percent change from baseline in predicted long-term risk of developing type 2 diabetes (T2D) between participants who achieved body mass index (BMI) <24 kg/m² and those with BMI ≥24 kg/m² (cutoff used to define overweight/obesity in SURMOUNT-CN).

Methods: The 10-year T2D risk was calculated for participants at baseline, week 24, and week 52 using the QDiabetes-2018 risk engine. Predictors included age, sex, ethnicity, smoking, family history of diabetes, history of cardiovascular disease, treated hypertension, mental disease, concomitant medication, glycated hemoglobin (HbA1c), and BMI. A mixed model for repeated measures was used to compare percent risk change from baseline by achievement of BMI <24 kg/m² or not at week 52. Model terms included week-52 BMI status, time point, BMI-status-by-time-point-interaction, baseline risk, sex, and baseline presence of comorbidities.

Results: A total of 162 participants with non-missing predictors at baseline and week 52 were included, with 32 achieving BMI <24 kg/m² (all tirzepatide treated). Compared to participants with BMI ≥24 kg/m² at week 52, participants achieving BMI <24 kg/m² were more frequently females (65.6% vs 42.3%), with a lower body weight (81.1±10.7 kg vs 94.5±16.4 kg), BMI (29.9±2.7 kg/m² vs 33.0±3.7 kg/m²), and smaller waist circumference (96.7±8.3 cm vs 107.1±10.1 cm) at baseline ($p < 0.05$ for all). The least square mean baseline T2D risk was significantly lower for those with week-52 BMI <24 kg/m² compared with those with BMI ≥24 kg/m² (3.1% vs 6.1%; $p < .001$). After adjusting for baseline risk and other aforementioned covariates, percent risk decrease from baseline to week 52 was significantly higher for participants with BMI <24 kg/m² compared with participants with BMI ≥24 kg/m² (-89.2% vs -59.0%; $p < .001$). Subgroup analysis results were similar, with the percent risk change from baseline to week 52 being significantly higher for those with BMI <24 kg/m² than those with BMI ≥24 kg/m² among participants with baseline pre-diabetes, without baseline pre-diabetes, or randomized to tirzepatide ($p < .001$ for all). When further breaking down the BMI ≥24 kg/m² group, percent risk change from baseline to week 52 was significantly higher for those achieving BMI <24 kg/m² (-89.4%) compared with those with BMI 24 to <28 kg/m² (-76.5%) and those with BMI ≥28 kg/m² at week 52 (-43.9%) ($p < .001$ for both).

Conclusion: Participants with obesity/overweight who achieved BMI <24 kg/m² experienced significantly greater predicted T2D risk reductions compared to those with BMI ≥24 kg/m² following interventions irrespective of their baseline prediabetes status. Since the T2D risk was derived from a risk model, prospective trials are needed to corroborate the results.

PO4.050

Exploring Network Pharmacology and Molecular Docking of E. tapos Yoghurt to Manage Maternal Obesity

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Background: Maternal obesity, characterized by an elevated body mass index (BMI) during pregnancy, is known to have adverse effects on the offspring. However, a recent study suggests that Elateriospermum tapos (E. tapos) yoghurt may hold potential in mitigating excessive weight retention post-pregnancy. Thus, this study aims to employ network pharmacology to explore the pharmacological effects of the bioactive compounds present in E. tapos yoghurt against maternal obesity.

Methods: Initially, a screening process is conducted to identify the bioactive compounds in E. tapos yoghurt, followed by the prediction of potential gene targets for these compounds using Swiss Target Prediction and SuperPred databases. Maternal obesity-associated genes are sourced from the OMIM, DisGeNet, and GeneCards databases. The interaction between the identified compounds and maternal obesity genes is established through protein-protein interaction analysis, gene ontology examination, and KEGG pathway analysis. To validate the results, molecular docking studies are conducted using AutoDock Tools software.

Results: The findings reveal that out of the 64 compounds analyzed, three meet the screening criteria, resulting in a total of 380 potential gene targets. Among these targets, 240 are shared with maternal obesity-related genes. Further analysis demonstrates the favorable affinity of these active compounds with key targets, linking them to biological processes involving protein phosphorylation, inflammation, as well as pathways related to lipid metabolism, atherosclerosis, and other signaling pathways.

Conclusion: In conclusion, this study provides valuable insights into the potential pharmacological effects of the bioactive compounds found in E. tapos yoghurt against maternal obesity. These findings open avenues for further exploration and potential therapeutic interventions targeting maternal obesity.

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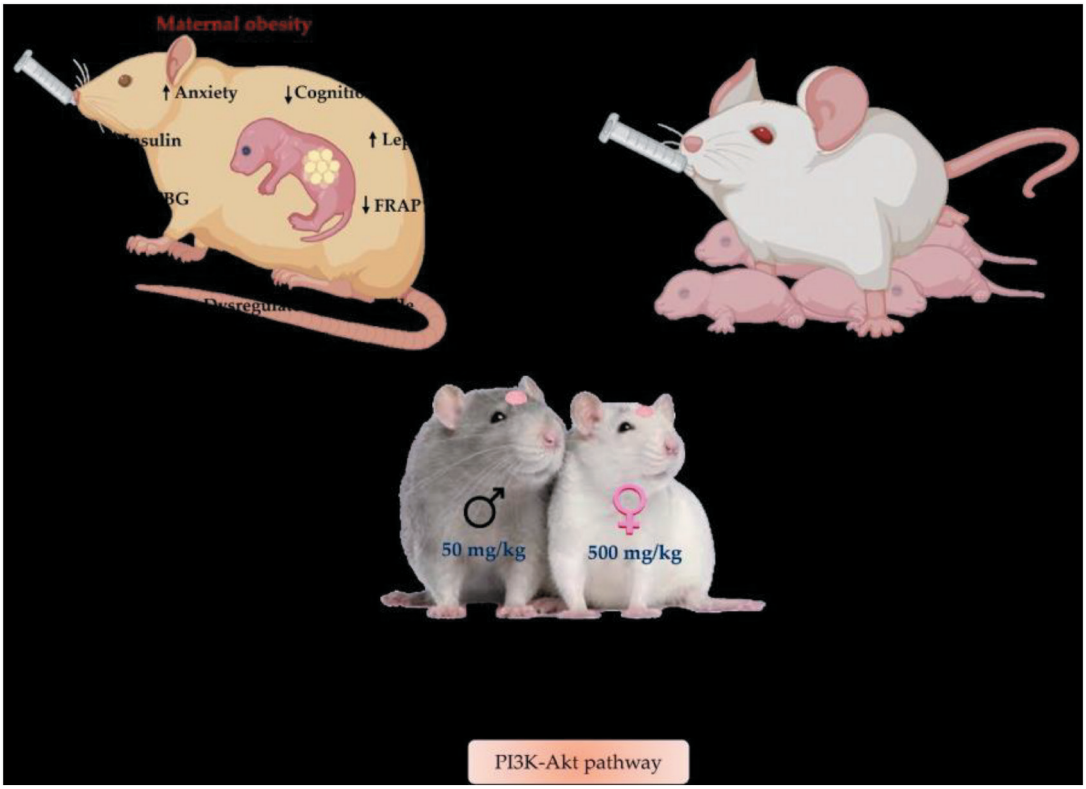


Fig. 1. Graphical Abstract

PO4.051

Atherogenic Index as a Marker of Obesity Incidence in Older Patients

Opris, S.; Constantin, G. I.

National Institute of Gerontology and Geriatrics

Objectives: The prevalence of obesity in older people is high and there is a close relationship between lipid profile changes and aging. Atherogenic index (AI) could be good predictor for metabolic disturbances. Our study aimed to investigate the link between AI and obesity incidence at older patients

Methods: Observational cross-sectional study comprised 358 patients over 65 years old: obese patients group (n=224); normal weight patients (n=134) as control group. AI was computed as log (TG/HDL) and high risk define as >0.24.

Results: AI values are significantly higher (0.44±0.29 vs. 0.21±0.30; p<0.001) in obese compared to normal weight patients. In obese patients, 76.33% are at high risk and respectively at normal weight patients 42.53%, are at high risk (hence atherogenic risk increases 1.79 times). From the point of view of gender, obese women have significantly lower AI values than men (p<0.001), so even at menopause, women have a lower atherogenic risk. The prevalence of dyslipidemia at obese patients rises from 31.94% in low risk AI to 75% in those at high risk. Multivariate regression analysis showed that patients with high AI had 4.35-fold risk for obesity [OR 4.35, 95% CI: 2.74-6.90, p<0.0001].

Conclusions: Our study confirms that obesity affects AI especially in older patients who have lipid disturbances. In conclusion, AI is associated with obesity incidence; high risk AI leads to an increase in the prevalence of obesity, therefore AI could be a helpful marker in risk assessment of obese patients.

PO4.052

Atherogenic Index and Cardiovascular Risk in Obese Older Patients

Opris, S.; Constantin, G. I.

National Institute of Gerontology and Geriatrics

Objectives: Our study aimed to investigate the impact of obesity on atherogenic index (AI) and HeartScore, at older patients with coronary artery disease. AI has been shown to be connected with lipid modifications and cardiovascular diseases and that it can be used as a predictor for future cardiac events.

Methods: We were taken into the study 168 patients (over 60 years) with coronary artery disease divided into 3 groups: Group 1-normal weight patients - as control group; Group 2-overweight patients; Group 3-obese patients. AI was computed as log (TG/HDL) with cut-off >0.24 and HeartScore from a cardiovascular disease risk assessment system with high risk >5%.

Results: HeartScore are significantly higher (p<0.0001) in obese and overweight compared with normal weight. There is a significant increased in AI comparing group obese with normal weight and overweight group (p<0.005 respectively p<0.001). Regression equation revealed at normal weight group HeartScore positively correlated with BMI (r=0.54, p<0.001). For overweight group there are positive correlations: HeartScore and BMI (r=0.24, p<0.01); AI and BMI (r=0.34, p<0.0001); HeartScore and AI (r=0.59, p<0.0001).

Conclusions: Our study confirms that obesity affects AI and leads to higher cardiovascular risk. Lipid ratios remain useful tools for the diagnosis and prognosis and could be helpful in the management of clinical treatments.

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PO4.053

The effects of high protein intakes during energy restriction on body composition, energy metabolism and physical performance in recreational athletes

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Background: Athletes employ weight loss practices to lower body fat and maintain fat-free mass. High protein diets have been shown to produce greater fat loss and retention of lean mass during periods of energy restriction (ER) in sedentary individuals with obesity, less is known about the effects of high protein diets in trained individuals during ER. Although current recommendations for protein intake in active individuals are 1.2-1.7g/kg, it is unclear whether higher intakes are necessary to maximize FFM (fat-free mass) retention and maximize physical performance in athletes undergoing periods of ER.
Objective: Determine whether high protein intakes could maximize FFM retention and physical performance in trained individuals after a period of ER.
Methods: Twenty-one college aged athletes (13 women and 8 men) underwent a 6-week 25% ER intervention with a 3-day full body resistance training. Participants were randomly assigned to a low (~1.2g/kg), moderate (~1.6g/kg) or high(~2.2g/kg) protein intake. Baseline and post-intervention outcomes: Dual X-ray absorptiometry, isotopic water dilution, indirect calorimetry, dietary records and strength based physical testing.
Results: Significant reductions in body mass ($p = 0.047$) and fat mass ($p = 0.04$) with simultaneous increases in FFM ($p = 0.037$) were noted for all groups, with no protein intake effect. Significant increases in physical performance outcomes (5RM strength) were noted for most measures ($p<0.05$).
Conclusion: Current recommendations of 1.2-1.7g/kg appear sufficient for most recreational athletes even during periods of ER to maintain FFM and physical performance.

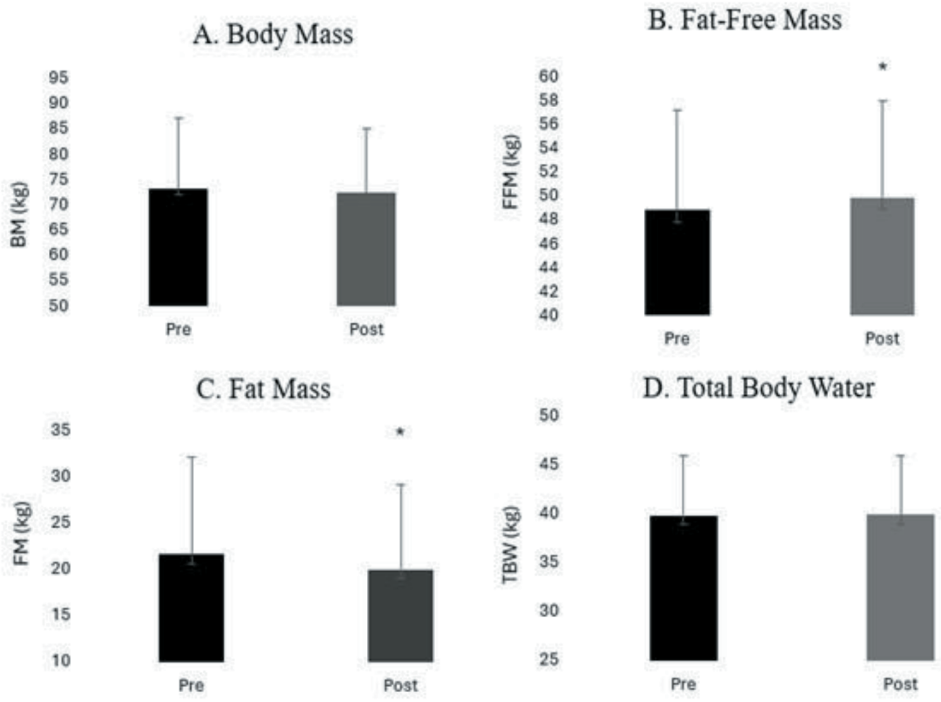
PO4.054

Impact of Three Dietary Strategies on Weight Loss, Metabolic Health, and Inflammatory Parameters in Overweight or Obese Adults: A Pilot Study

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Introduction: Obesity is a chronic condition associated with increased risk of metabolic and cardiovascular diseases, making it a major public health concern. While dietary interventions are critical for managing obesity, their comparative effects on body composition and metabolic health require further investigation.
Objective: This pilot study evaluates the impact of three dietary strategies—Mediterranean Diet, Low-Carb Diet, and High-Protein Diet—on weight loss, body composition, and metabolic markers in adults with overweight and/or obesity.



Changes in body composition across all groups from pre- to post-intervention (n=21). (A) Significant decreases in body mass were observed from pre- to post-intervention ($p < 0.05$). (B) A significant increase in fat-free mass was noted within our whole sample from pre- to post- intervention (($p < 0.05$). (C) A main effect of our intervention was observed for reductions in fat mass ($p < 0.05$). (D) No changes in total body water were observed from pre- to post-intervention within our whole sample size. All those changes occurred independently of protein intake. Error bars show mean ± SD.

Fig. 1. Body composition changes in recreational athletes after 6 weeks of energy restriction (-25%) with resistance training.

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Methods: A randomized controlled trial recruited 45 adults with overweight or obesity, of whom 37 completed the 12-week intervention. Participants were randomized into three dietary groups: Mediterranean Diet, Low-Carb Diet, or High-Protein Diet. Assessments included weight, Body Mass Index (BMI), fat mass, waist and hip circumference, blood pressure, adherence to the Mediterranean Diet, ultraprocessed food consumption, sleep hours, and sedentary minutes. Metabolic markers included fasting glucose, glycated hemoglobin, fasting insulin, lipid profile (total cholesterol, LDL, HDL, triglycerides), uric acid, and C-reactive protein. Statistical analyses included paired tests and between-group comparisons. Post-intervention follow-up was conducted to evaluate dietary adherence and potential rebound effects.
Results: The Mediterranean Diet resulted in the greatest reductions in weight (-8.54 kg, $p<0.001$), BMI (-3.09 kg/m², $p<0.001$), fasting glucose ($p<0.001$), waist circumference (-8.32 cm, $p<0.001$), and systolic blood pressure (-10.14 mmHg, $p<0.001$). The Low-Carb Diet produced moderate weight loss (-4.34 kg, $p=0.01$) and significant reductions in BMI (-1.55 kg/m², $p=0.03$) and waist circumference (-4.74 cm, $p<0.001$). The High-Protein Diet showed limited effects on weight (-4.43 kg, $p=0.81$) and BMI (-1.62 kg/m², $p=0.25$) but significantly reduced C-reactive protein levels ($p=0.01$), suggesting potential anti-inflammatory benefits. Improvements in adherence to the Mediterranean Diet were notable in the Mediterranean group, while consumption of ultraprocessed foods decreased across all groups. Follow-up showed that adherence to interventions mitigated rebound weight gain in the Mediterranean and Low-Carb Diet groups.
Conclusion: The Mediterranean Diet demonstrated the most significant improvements in weight loss, metabolic parameters, and adherence to dietary guidelines, establishing it as a robust strategy for managing obesity. The Low-Carb Diet showed intermediate efficacy, while the High-Protein Diet offered potential anti-inflammatory benefits. These findings emphasize the importance of tailoring dietary interventions to individual needs and underscore the role of the Mediterranean Diet as an effective and comprehensive approach to obesity management. Future research should explore these strategies in larger populations and evaluate long-term outcomes.

PO4.055

Effect of Omega-3 Fatty acids Supplementation on Muscle Mass, Fat Mass, and Visceral Fat of Hemodialysis Patients; A Randomized Clinical Trial

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Background: Several studies demonstrated the benefits of omega-3 fatty acids supplementation in chronic kidney disease (CKD) patients. The objective of this study was to investigate effect of omega-3 fatty acids supplementation in body composition, specifically on the lean body mass and fat mass in hemodialysis patients.
Methods: In this randomized, double-blind, placebo-controlled clinical trial, a total of 120 end-stage renal disease (ESRD) patients were randomly allocated into two groups. The intervention group has taken three grams of omega-3 fatty acids daily while the placebo group received three grams of medium chain triglycerides (MCT) as a placebo for a total of 2 months. The changes in in the body mass index (BMI) and body composition (fat mass, muscle, and visceral fat) were assessed at baseline and following the intervention.
Results: No significant difference was found in the mean of BMI, FAT, muscle, and visceral fat in the intervention group compared to the control group after the intervention. After two months of omega-3 fatty acid supplementation, the study found no statistically significant impact of omega-3 fatty acids supplementation on various indices of body composition. The effect of ω-3 supplementation in reducing visceral fat was close to significant (P=0.08).
Conclusion: This study suggests that there is currently inadequate evidence to support the effect of omega-3 fatty acid supplementation in improving anthropometric measurements in patients with CKD, except a partial effect on visceral fat. Further large-scale and long-term clinical trials are needed to confirm the present results.

PO4.056

Association of nonalcoholic fatty liver disease with the different types of dietary carbohydrates: a cross-sectional study

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Background: Many factors like sedentary lifestyle, metabolic syndrome, and obesity are involved in the increased prevalence of nonalcoholic fatty liver disease (NAFLD). Dietary consumption of carbohydrates may has a role in the risk of NAFLD. This study aimed to investigate the association of NAFLD with the different types of dietary carbohydrates.
Methods: This cross-sectional study was carried out on 4200 participants including 660 patients with NAFLD and 3540 helathy individuals without NAFLD ages 35 to 70 in sabzevar, Iran. Data on socio-deomgraphic status, anthropomrtric measurments, blood tests, and dietary intake of different types of dietary carbohydrates was collected.
Results: The patients with NAFLD had a significantly higher dietary intake of glucose (29.38 ± 18.29 vs. 27.42 ± 15.96 g/d, P = 0.01) and fructose (33.99 ± 20.19 vs. 31.95 ± 18.34 g/d, P = 0.01) compared to the healthy people. A positive association was observed between NAFLD with the total intake of carbohydrates after adjustment for age, sex, and BMI (OR: 1.001, CI 95%: 1-1.002, P = 0.04) The association remained significant after further adjustments for for education level, marital status, physical activity, smoking, and drinking alcohol (Model 2) and after additional adjustments for calorie intake (Model 3).
Conclusions: This study showed a positive association between total dietary carbohydrate and NAFLD. In particular, the amount of dietary of carbohydrates (regardless of the type of carbohydrate) may worsen NAFLD. Further longitudinal studies are warranted

PO4.057

Association of dietary antioxidant index with body mass index in adolescent

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Background: Dietary antioxidants may decrease body fat through reduction of oxidative stress. This study aimed to examine the association between dietary antioxidant index (DAI) and body mass index (BMI) in adolescent boys.
Methods: In this cross-sectional study, 593 adolescent boys aged 12-16 years were randomly selected and were divided into two groups of overweight and non-overweight individuals. Data on physical activity and anthropometric measurements were collected. Dietary intake was assessed using 168-item semi quantitative food frequency questionnaire and the DAI score was calculated to measure the antioxidant capacity of the diet.
Results: The overweight adolescents had higher intake of energy (2490.55 ± 632.49 vs. 2354.33 ± 632.64 kcal/d, p = 0.01), carbohydrate (290.21 ± 71.41 vs. 272.93 ± 79.22 g/d, p = 0.01), fat (111.51 ± 40.76 vs. 104.51 ± 35.56 g/d, p = 0.04), calcium (811.70 ± 283.70 vs. 741.06 ± 251.17 g/d, p = 0.003), and

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vitamin D (1.41 ± 1.17 vs. 1.18 ± 1.19 μg/d, p = 0.031) in comparison with normal weight adolescents. The DAI had an inverse association with BMI after adjustment for age and caloric intake (OR: 0.85, 95% CI: 0.76-0.96, p = 0.009). Additional adjustment for dietary intake of vitamin A, vitamin E, vitamin C, zinc, manganese, and selenium did not change the results.
Conclusion: The results of the study showed that following a diet rich in antioxidants may be effective in preventing obesity in adolescent boys. Further longitudinal studies are needed to confirm these finding and to determine the underlying mechanisms.

PO4.058

The association between obesity with treatment duration, ICU length of stay, and the risk of death in critically ill patients with COVID-19

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Background: Despite the confirmed association between higher BMI with increased risk of the acute respiratory distress syndrome (ARDS), the association between obesity with mortality in critically ill patients with coronavirus disease 2019 (COVID-19) is not clear. The present study aimed to investigate the association between obesity with treatment duration, ICU length of stay, and the risk of death in critically ill patients with COVID-19.
Methods: This case-control study was performed on 148 surviving patients (as the control group) and 75 eventually dead patients (as the case group) with COVID-19 in Rasht, Iran. Data on demographic factors, comorbidities, anthropometric measurements, the length of hospitalization and the mortality were obtained from patients' medical records.
Results: The mortality rate was significantly associated with weight (OR=1.04, CI95%: 1.002-1.083, P=0.04), but not with BMI after adjustments for age, gender, length of stay in ICU, chronic diseases, and smoking. The results did not change after further adjustments for biochemical and pathological factors.
Conclusions: Weight was positively associated with mortality after controlling for confounding variables. Further studies should consider the patient's body composition, such as fat mass, to establish the relationship between obesity and covid-19 outcomes.

PO4.059

The effect of FTO gene rs9939609 polymorphism on the association between colorectal cancer and different types of dietary fat intake: a case-control study

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Background: Colorectal cancer (CRC) is one of the most common cancers in the world. Some dietary factors such as fat intake have been identified as the risk factors for CRC. This study aimed to investigate the effect of fat mass and obesity-associated (FTO) gene rs9939609 polymorphism on the association between CRC and different types of dietary fats.
Methods: This case-control study was performed on 135 CRC cases and 294 healthy controls in Tehran, Iran. Data on demographic factors, anthropometric measurements, physical activity, the intake of different types of dietary fats, and FTO gene rs9939609 polymorphism was collected from all participants. The association between cancer and dietary fat intake in individuals with different FTO genotypes was assessed using different models of logistic regression.
Results: Oleic acid intake was higher in the case group compared to the control group in both people with TT (7.2±3.46 vs. 5.83±3.06 g/d, P=0.02) and AA/AT genotypes (8.7±6.23 vs. 5.57 ±3.2 g/d, P<0.001). Among carriers of AA/AT genotypes of FTO rs9939609 polymorphism, a positive association was found between CRC and higher intakes of oleic acid (OR=1.12, CI95% 1.03-1.21, P=0.01) and cholesterol (OR=1.01, CI95% 1.00-1.02; P=0.01) after adjusting for age, sex, physical activity, alcohol use, smoking, calorie intake, and body mass index.
Conclusion: Higher intakes of cholesterol and oleic acid were associated with a higher risk of CRC in FTO-risk allele carriers. The association of CRC and dietary fat may be influenced by the FTO genotype. Further longitudinal studies are warranted to confirm these findings

PO4.060

The effect of GLP-1RAs on mental health and psychotropic drug-induced metabolic disorders: A systematic review

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Background: Mental illnesses and psychotropic drug use are associated with an increased risk of weight gain and metabolic disorders. Growing evidence suggests that agonists of the glucagon-like peptide-1 receptor (GLP-1RAs) might be safe and effective weight loss medications. However, the current evidence for the use of GLP-1RAs in individuals with obesity and mental illness is limited.
Objective: Evaluation of the safety and the impact of GLP-1RAs on mental health and psychotropic drug-induced metabolic disorders such as obesity and type 2 diabetes (T2D).
Methods: A literature search from January 1st, 2010 to August 31st, 2024 was conducted using PubMed and Cochrane Library online databases. Studies comprising adults suffering from obesity or/and T2D and a diagnosis of a mental disorder were included. Studies that examined persons with obesity or/and T2D without mental illness and completed psychiatric questionnaires before and after GLP-1RA treatment were also included.
Results: GLP-1RAs lead to a significant weight loss and improvement of glycemic control in patients with mental illness on psychotropic drugs. They showed a beneficial effect on mental health in patients with and without mental disorders and were not associated with a worsening of mental state, suicidality, new-onset mental illness, or increased psychiatric admissions.
Conclusion: GLP-1RAs are safe and effective weight loss treatments for individuals living with obesity and mental illness exerting a positive effect on mental state and quality of life. In future, it would be of great interest to conduct studies investigating the use of GLP-1RAs with the purpose to treat mental illness in order to directly assess their use in improving mental health.

PO4.061

Dual amylin and calcitonin receptor agonist colulintide (LY3541105) increased cortisol in a phase 1 study

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[1]Eli Lilly and Company
[2]Tigermed-BDM Inc.

Introduction: Colulintide is a potent dual amylin and calcitonin receptor agonist under development as a once-weekly SC treatment for chronic weight management.
Methods: This phase 1, randomized, placebo-controlled, dose-escalation study evaluated the safety, pharmacodynamics (PD), and pharmacokinetics (PK) of single doses in healthy participants (Part A); and multiple doses in participants with overweight or obesity (Parts B and C). Doses were administered weekly and were progressively up titrated. The multiple dose parts of the study included measures to evaluate cortisol, including salivary cortisol collected between 11pm and midnight (Part B higher doses

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and Part C), and assessments of 24-hour urinary cortisol and a dexamethasone suppression test (part C). In Part A, bone resorption marker CTX-1 was measured in serum. In Part C, CTX-1 was measured in serum and from a 24-hour urine collection, and bone formation marker P1NP was assessed in serum.

Results: Part B included participants with a mean age of 46 years, BMI of 32.0 kg/m2, and 23% female and Part C included participants with a mean age of 43 years, BMI of 32.0 kg/m2, and 22% female. The cortisol findings are provided for baseline and at target dose (table). Parts B and C showed dose and drug-concentration dependent increases beyond the upper limit of normal in salivary cortisol, an indication of hypercortisolism that was confirmed with measures of 24-h urinary cortisol and a dexamethasone suppression test in Part C (table). Early decreases in CTX-1 were observed at all colulintide dose levels, although this biomarker subsequently increased during ongoing treatment. At day 66 in Part C, the percent changes from baseline in serum CTX-1, urinary CTX-1, and PINP were 38.6%, 187.5% and -23.7%, respectively, in participants receiving the highest dose of colulintide and 17.9%, 52.1%, and 1.4%, respectively in participants receiving placebo.

Conclusion: In this phase 1 study, colulintide showed evidence of dose-dependent hypercortisolism associated with increased bone resorption and decreased bone formation. It is unknown whether these findings are molecule-specific or could be related to the mechanism of action.

Tab. 1. Effects on cortisol.

Part B, n=113					
	Placebo n=28	Dose 3 n=21	Dose 5 n=25	Dose 6 n=23	
Cortisol (saliva)*, nmol/L					
Baseline	1.02 (0.91) [1/19]	2.00 (2.85) [5/21]	0.82 (0.98) [1/25]	1.56 (4.44) [1/23]	
Day 80	0.75 (0.64) [0/19]	2.02 (1.46) [6/21]	3.42 (2.48) [9/18]	3.31 (2.66) [8/17]	
Part C, n=45					
	Placebo n=15	Dose 1 n=4	Dose 2 n=7	Dose 3 n=10	Dose 4 n=9
Cortisol (saliva)*, nmol/L					
Baseline	1.82 (2.20) [2/15]	1.24 (0.64) [0/4]	0.82 (0.53) [0/7]	0.94 (0.77) [1/10]	0.86 (0.62) [0/9]
Day 66	1.04 (2.00) [1/14]	0.91 (0.38) [0/4]	1.57 (0.80) [1/6]	2.26 (0.98) [5/10]	3.59 (2.21) [4/8]
24-hour Urinary Free Cortisol, nmol/day					
Baseline	128.8 (95.36) [3/15]	100.05 (73.38) [1/4]	136.42 (95.75) [2/7]	110.4 (58.23) [1/10]	118.07 (38.39) [1/9]
Day 66	70.18 (39.34) [0/14]	124.20 (37.37) [1/4]	186.30 (58.85) [1/6]	239.57 (136.92) [6/10]	215.28 (97.84) [4/8]
Serum Cortisol after Dexamethasone (1 mg) Suppression Test^, nmol/L					
Baseline	27.60 (0.00) [0/15]	27.60 (0.00) [0/4]	27.60 (0.00) [0/7]	27.60 (0.00) [0/10]	27.60 (0.00) [0/9]
Day 66	27.60 (0.00) [0/14]	27.60 (0.00) [0/4]	27.60 (0.00) [0/6]	60.03 (92.91) [2/10]	79.55 (84.46) [4/8]
Dose groups are numbered by increasing dose.					
Data presented as mean (standard deviation) [proportion above the normal range]					
*Cortisol (saliva) collected between 11 pm and midnight; ^Dexamethasone suppression test - 8 am serum cortisol following a 1 mg dexamethasone tablet ingested the previous night.					
Upper limit of normal (ULN) Cortisol (saliva)=2.48 nmol/L, ULN Urinary Free Cortisol = 176.64 for men and 115.92 nmol/day for women.					
The lower limit of quantitation for serum cortisol was 55.2 nmol/L and an abnormal dexamethasone suppression test was defined as serum cortisol after dexamethasone ≥55.2 nmol/L. Values below the lower limit of normal were imputed as 27.6 nmol/L.					

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PO4.062

Selenium status varies from suboptimal to supersaturated in older adults after metabolic and bariatric surgery

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Introduction: Metabolic and Bariatric Surgery (MBS) is a proven treatment for obesity. Still, changes in gastrointestinal anatomy and dietary intake increase risk of nutrient deficiencies. Clinical guidelines recommend supplementation for several vitamins and minerals after MBS, but not for selenium (SE), as existing literature is scant and heterogenous. SE dietary intake decreases with age and inadequate SE status is associated with numerous health outcomes, yet supplementation is not without risk. The aim of this study was to investigate SE status¸ measured by selenoprotein P (SELENOP), plasma SE (pSE), and dietary SE intake from foods and supplementation (supp), in older adults with previous MBS.
Methods: With a cross-sectional comparative design, we compared adults older than 65 years with previous MBS (group BAR) to adult after non-surgical obesity management (group CON). This analysis formed part of a study investigating sarcopenia in older adults after MBS. Patients were recruited from the University Hospitals Leuven Obesity Clinic, Belgium. Venous blood samples were collected and analysed for pSE and SELENOP, by a validated enzyme-linked immunosorbent assay. Dietary intake was measured by two non-consecutive 24-hour recalls and food SE content was calculated using a previous analysis of 800 Belgian foods. SELENOP was reported continuously and categorised as suboptimal (<4.5mg/L), saturated, and elevated (>8.5 mg/L). Similarly, pSE was categorised as deficient' (<70µg/L), suboptimal, and replete (> 100µg/L). To investigate the effect of supplementation (supp), subgroups were created (supp vs. none). For investigating the role of covariates to predict SELENOP, linear regression modelling was performed.
Results: In total, 50 participants per group were included (male, BAR 40%, CON 35%). BAR participants were two years older (68.3±3. vs. 70.7±3.9) and more had diabetes (52% vs. 28%). SELENOP was significantly elevated in BAR-supp compared to BAR-none or CON-none, (median 7.63 [IQR 6.4 – 8.53] mg/L vs. 4.71 [3.76 – 6.45] and 5.81 [4.81 – 6.60], p < 0.001). BAR-supp had a lower prevalence of suboptimal SELENOP levels compared to BAR-none (7% vs. 43%) and more participants had elevated levels (28% vs 0%). For pSE, BAR-supp had higher levels compared to BAR-none or CON-none (144.0 [104 – 154] µ/L vs. 88.5 [72.5 – 96.8] and 97.5 [88 – 107], p < 0.001). The strongest predictors of SELENOP levels were supplemented SE followed by dietary SE from foods, and total weight loss to nadir (adjusted R2 for the model = 0.35, p < 0.001). Other clinical measurements, including glycaemic control and liver function, was not associated with SELENOP.
Conclusion: SE status varied considerably in older adults with earlier MBS, from deficiency to supersaturation. The ideal supplement dosage and the impact of surgery type remains unclear, and studies are needed to determine SE requirements. The relevance of SELENOP supersaturation warrants further investigation. In the interim, cautious supplementation and periodic monitoring of SE status could avoid extremities of intake.

PO4.063

The epigenetic phenomena of the obesogenic state: A translational framework for reducing inflammation in adipose tissue

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Excess of adipose tissue generates epigenetic modulation in specific regions of DNA. That promote an increase in transcription of NFκB and consequently pro-inflammatory cytokine synthesis. In this context, exercise and bariatric surgery can be considered an important intervention for the reduction of the inflammation and increasing life expectancy. However, it is not yet known whether weight loss, caused by exercise and bariatric surgery, regulate the epigenetic pathway of NFκB. The present study analyzes the epigenetic effects caused by the obesogenic state and the effects of two intervention, short-term strength exercise and bariatric surgery on epigenetic alteration in the specific transcription region of the NFκB gene in white adipose tissue of animals and humans. For this purpose, 3T3-L1 cells was treated with serum from obese animals, after

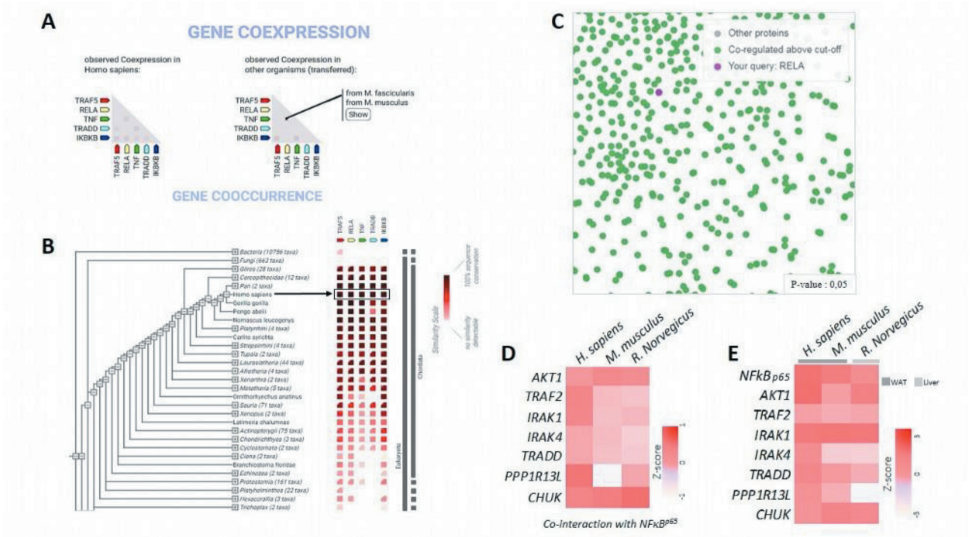


Fig. 1.

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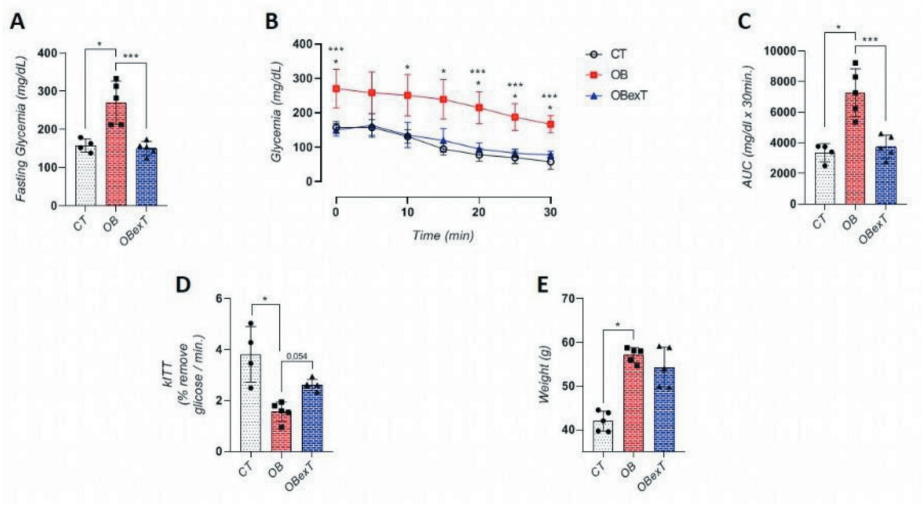


Fig. 2.

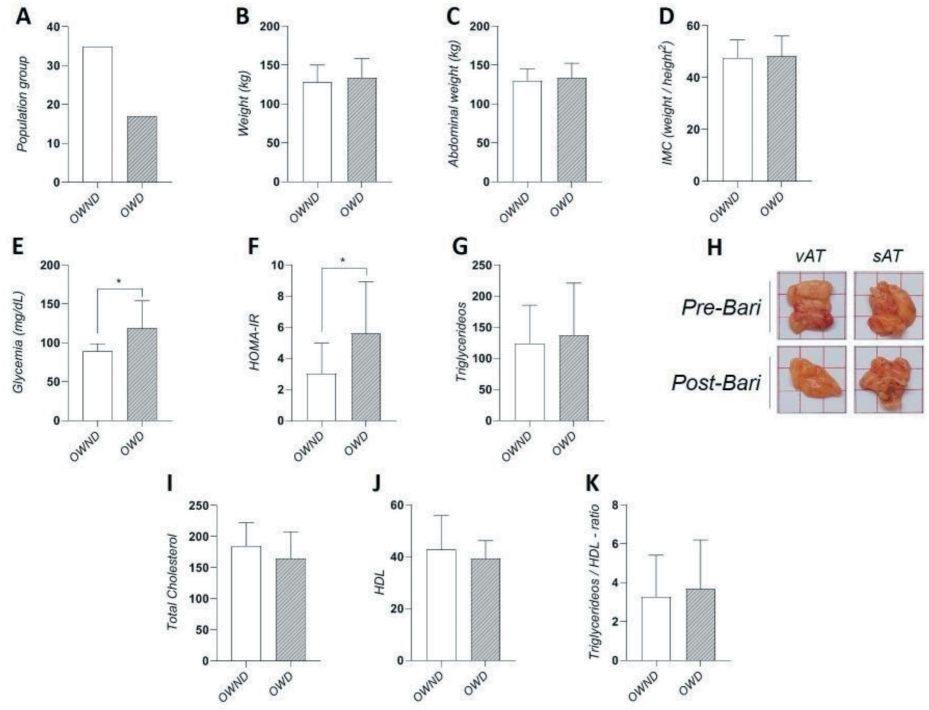


Fig. 3.

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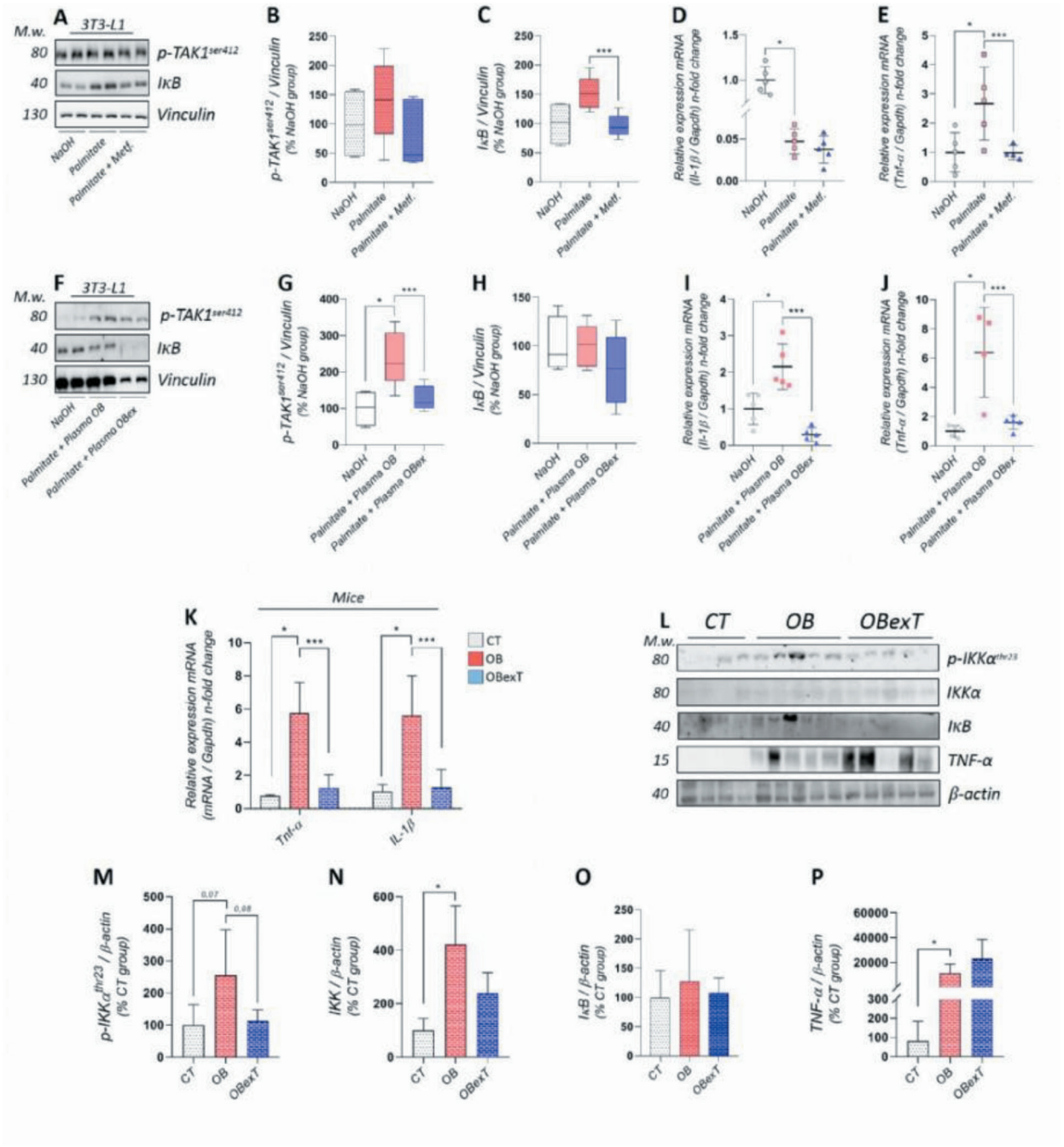


Fig. 4.

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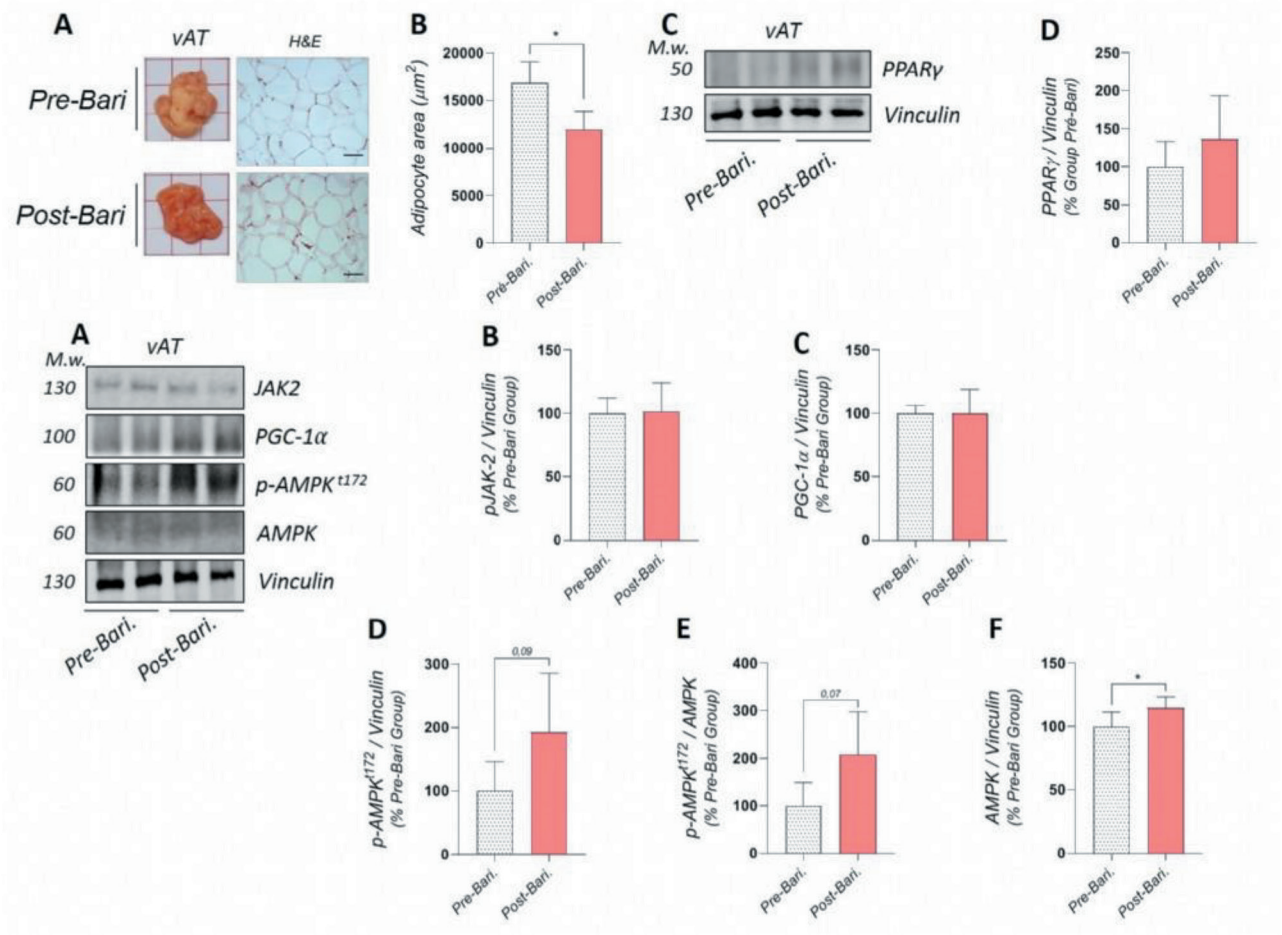


Fig. 5.

the euthanasia, into two cell groups: Palmitate + Plasma OB (obese sedentary), and Palmitate + Plasma OBex (OBex - obese strength training). For the animal experiment, Swiss mice were divided into three groups: control, sedentary obese, and exercised obese. The obese groups were induced into obesity for fourteen weeks of a high-fat diet, and the trained submitted to seven strength exercise sessions. The humans study was approved by the Ethics Committee of the Coimbra University Hospital Center (CHUC, reference: CHUC-115-20 & CHUC-202-20). All individuals agreed to participate in the study. Therefore, visceral adipose tissue (VAT) will be collected from a group of 42 adults with obesity (OB) at the Coimbra Hospital and University Center (CHUC), Portugal. Of the 42 participants, a total of 8 individuals with obesity were evaluated at T1 + T2 (six months after surgery). The inclusion criteria were the clinical condition indicating bariatric surgery: BMI >40 kg/m2, or ≥30 kg/m2 associated with others clinical diagnosis. Our results showed that animals in obesogenic state and humans with obesity had higher transcription of pro-inflammatory cytokines and increase expression and protein content of NFκB in visceral adipose tissue. Analysis of the demethylation activity demonstrated that animals of the sedentary obese group increased the availability of NFκB transcription. However, the obese strength exercise group significantly reduced the demethylated in specific region of NFκB transcription and humans after bariatric surgery significantly increase methylation in specific region of NFκB, resulting in lower expression and protein content of p-NFκBp65 after both intervention. Therefore, the greater propensity for NFκB transcription caused by the development of the obesogenic state demonstrated the potential for transcription of pro-inflammatory cytokines transcription. However, these different process of intervention, short-term strength exercise and bariatric surgery, was able to reverse this process. Short-term strength exercise and bariatric surgery is capable of reducing the area of visceral adipose, also, decreasing the transcription of pro-inflammatory genes, and reducing the transcription of NFκB, through inhibition of demethylation and promote methylation in specific region of DNA.

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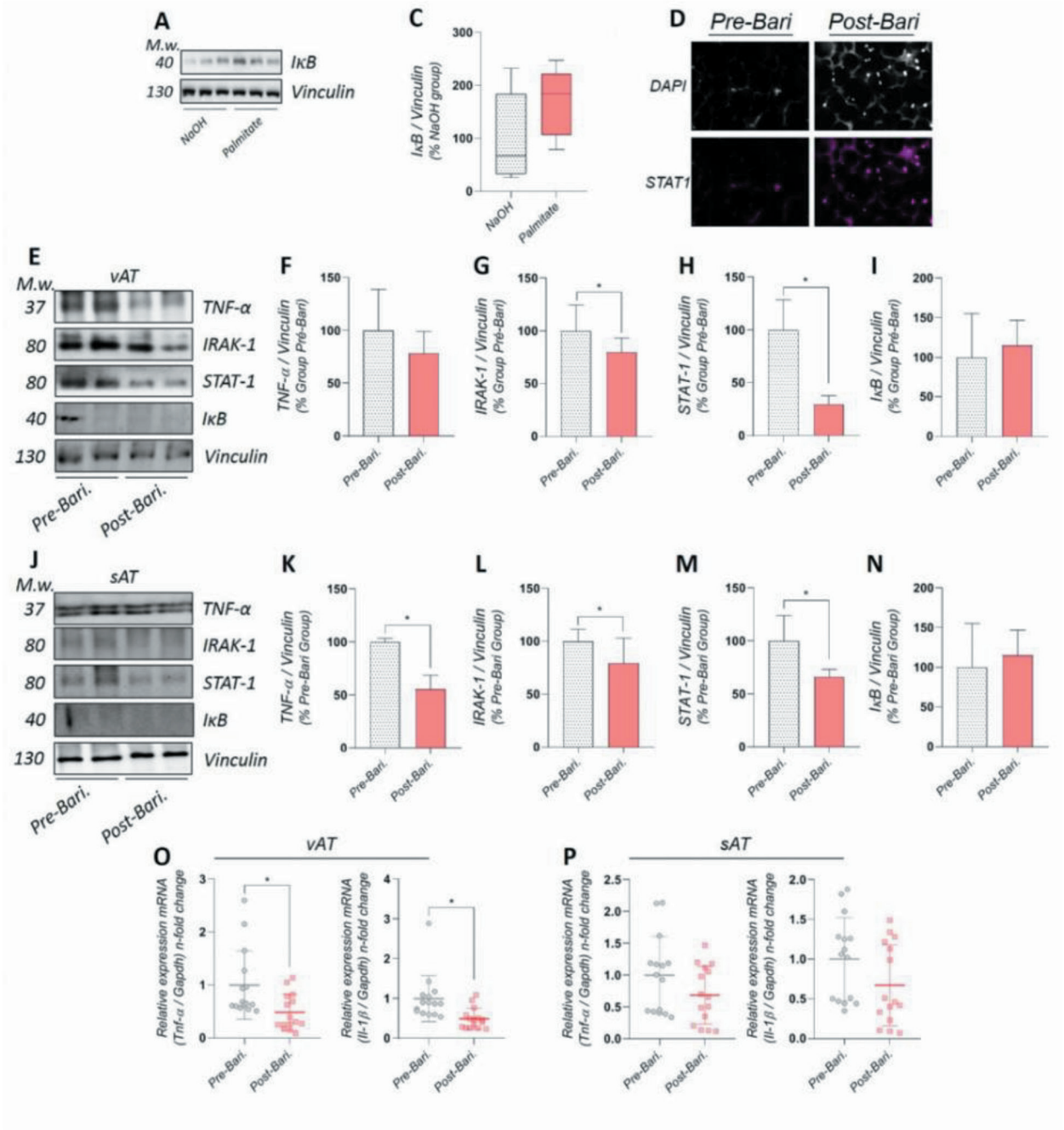


Fig. 6.

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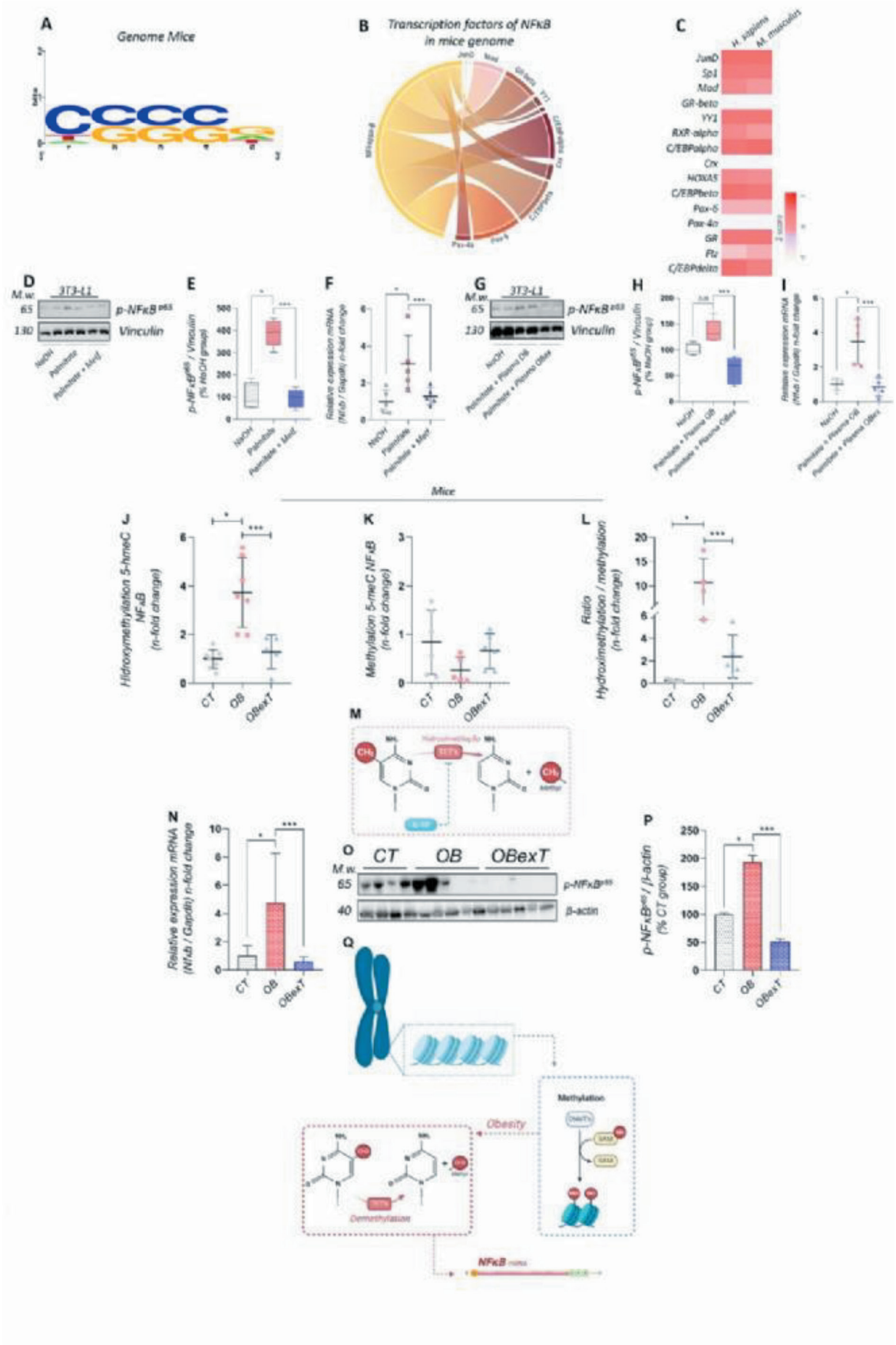


Fig. 7.

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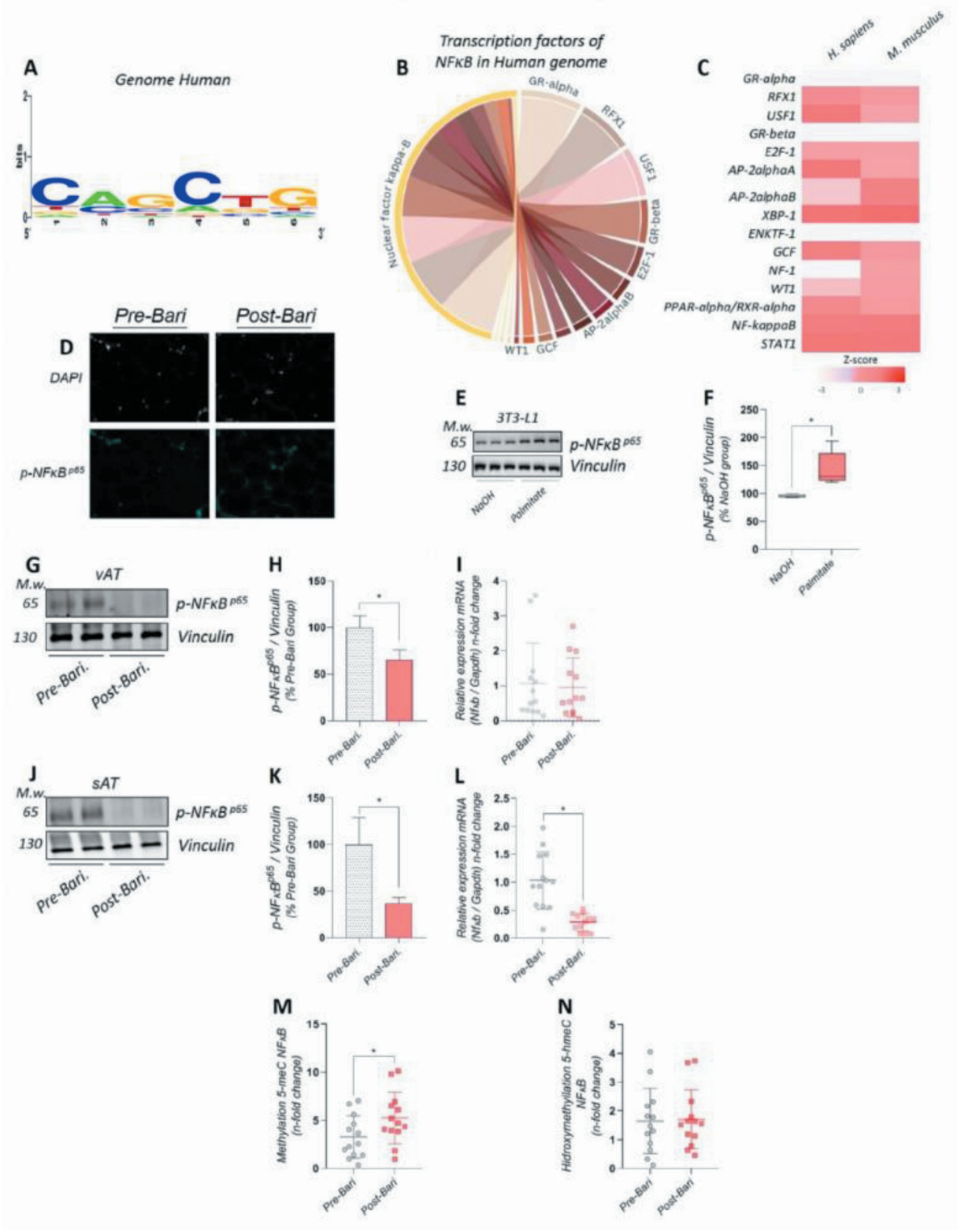


Fig. 8.

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PO4.064

Waist-to-Height Ratio Cut-Off Points for Central Obesity in Individuals with Overweight Across Different Ethnic Groups

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Introduction: The identification of surrogate measures of central obesity is of clinical importance, and the waist-to-height ratio (WtHR) has recently attracted great interest. For this reason, we aimed to establish specific WtHR cut-off points for adiposity (i.e., central obesity) in four different ethnicity groups of both sexes from the National Health and Nutrition Examination Survey (NHANES) population.
Methods: Of the total 23,037 participants who completed four cycles of the survey between the years 2011 and 2018, 3,566 individuals with available anthropometric measures (i.e., body weight, waist circumference and height) and dual X-ray absorptiometry-derived visceral adipose tissue (DXA-derived VAT) results were assessed in this cross-sectional study. Participants with an overweight status defined according to the World Heath Organization (WHO) body mass index (BMI) cut-off points (25–29.9 kg/m^2) were included. The sample was then categorized by adiposity according to the DXA-derived VAT tertiles (highest), and the best sensitivity and specificity were attained for predicting central obesity using the WtHR, according to the receiver operating characteristic (ROC) curve analysis.
Results: The WtHR cut-offs which were identified as having the best discriminating ability for central obesity were as follows: 0.57 for White males and 0.58 for White females, 0.55 for Black males and 0.57 for Black females, 0.56 for Asian males and 0.59 for Asian females, and 0.57 for Hispanic males and 0.59 for Hispanic females. Notably, all the new cut-offs suggested for each ethnicity and sex, when compared to ≥ 0.5, appear to improve the performance of the WtHR in identifying central adiposity. In other words, the new cut-offs in all ethnicities and sex (≥ 0.55) generally increase the correct identification rate for cases and reduce the false positives by nearly 20%.
Conclusions: Central obesity is clinically associated with severe comorbidities, and its early identification, especially by means of surrogate measures such as the WtHR, is thus crucial for managing the progression of the latter. In this study, we provide evidence that the optimal WtHR cut-off point (i.e., in all cases ≥ 0.55) corresponds to central obesity in adults of a both-sex population composed of different ethnicities. We therefore recommend the use of these new WtHR cut-off points when screening individuals for central obesity while taking into account their ethnicity and sex.

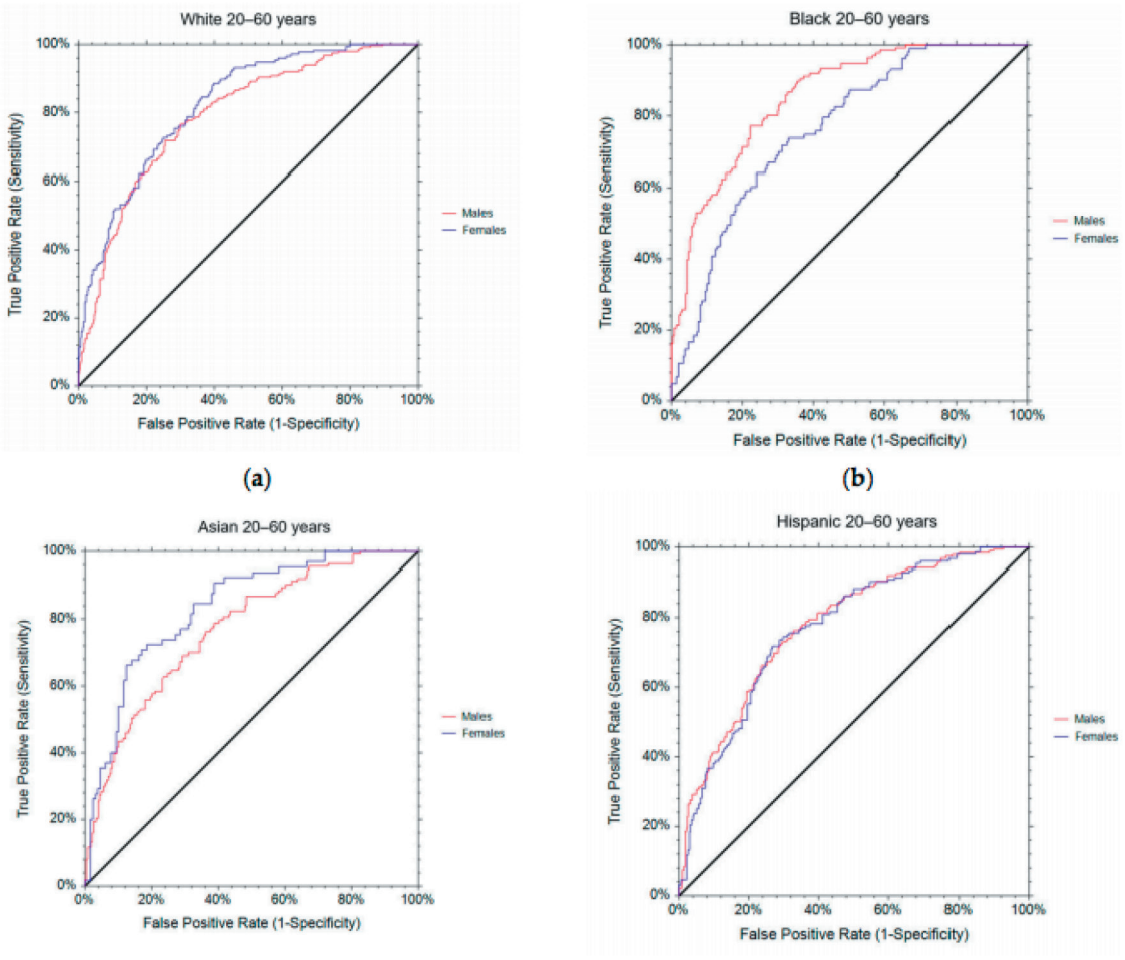


Fig. 1. Receiver operator characteristics curve by sex and ethnicity for WtHR to detect central obesity (DXA-derived VAT area) a) White b) Black c) Asian d) Hispanic.

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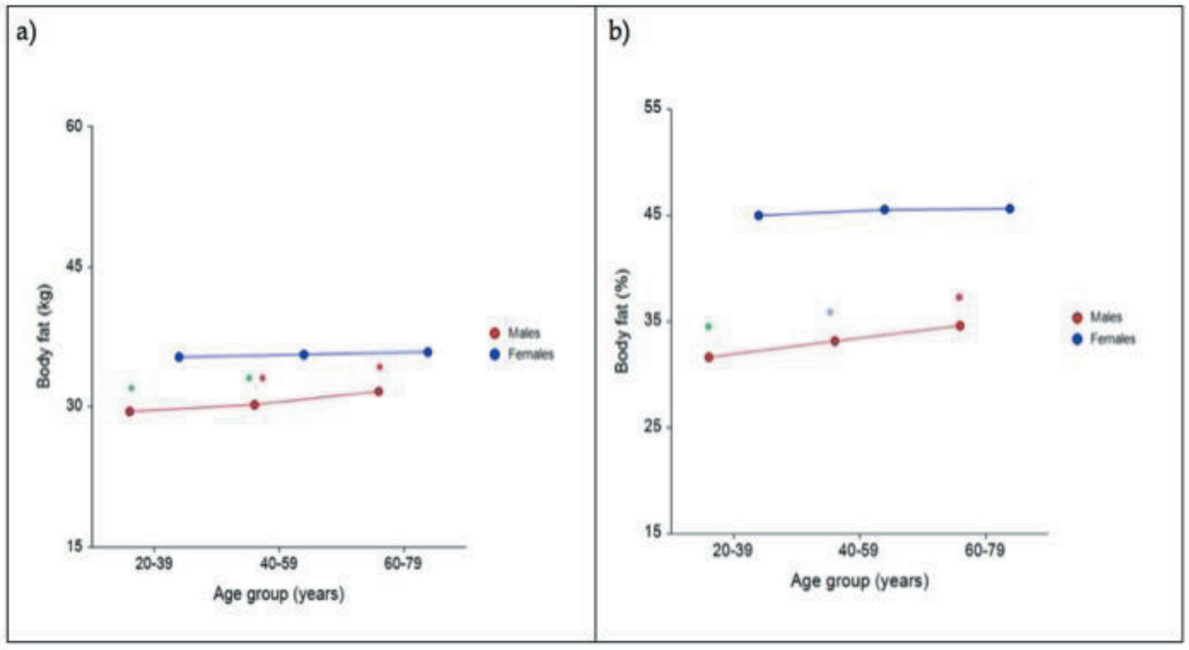
PO4.065

Redistribution of Total and Segmental Body Composition Across Age in Individuals With Obesity

El Ghoch, M.[1]; *De Lorenzo, A.*[2]; *Itani, L.*[3]; *Gualtieri, P.*[2]; *Frank, G.*[2]; *Raffaelli, G.*[2]; *Pellegrini, M.*[1]; *Di Renzo, L.*[2]

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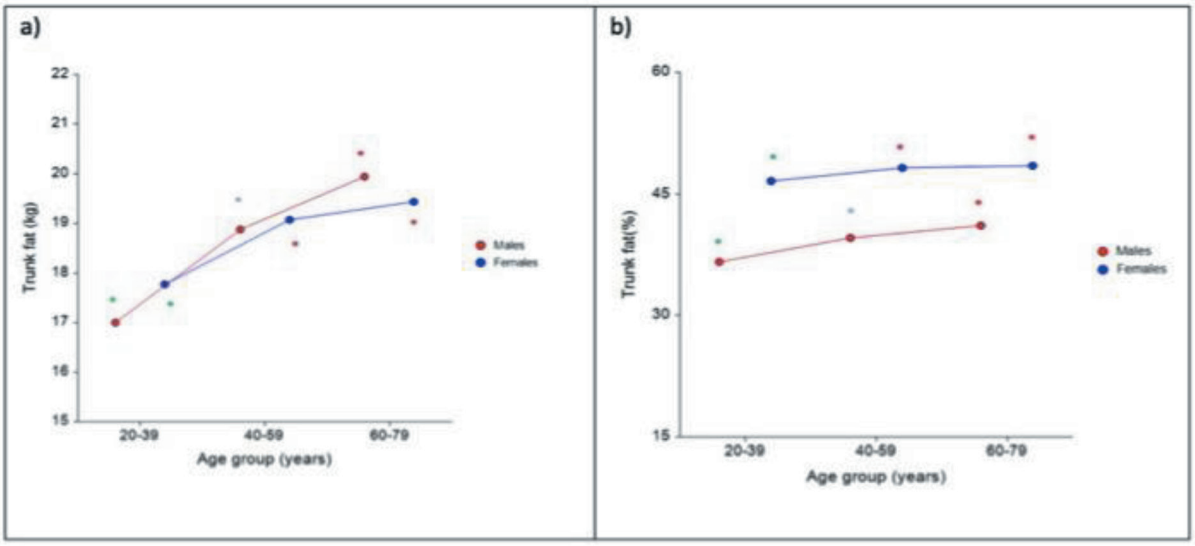
Introduction: Obesity is a major health problem characterised by an excessive accumulation of body fat (BF) that can also co-exist with a reduction in lean mass (LM). In people with obesity, little is still known about the changes in fat and lean masses across lifespan. For this reason, in this study, we aimed to analyse the differences in the total and segmental body composition between age groups.
Methods: A total of 2,844 adults of both sex and a Body Mass Index (BMI) ≥25 kg/m² underwent body composition assessments by means of Dual-energy X-ray Absorptiometry (DXA). The sample was categorized into three different age groups: 'Young-age' (20–39 years), 'Middle-age' (40–59 years), and 'Older-age' (60–80 years) adults that were compared between each other after being matched by body weight and BMI.
Results: The males showed an increasing trend in the total BF percentage and a decreasing total LM, from the young to older groups, while females, maintained similar values for these total compartments across the three age groups (i.e. total BF% and LM), however, participants of both sex showed an increase in trunk fat and a decrease in appendicular LM (ALM); revealing that participants in the middle- and older- age groups are more likely to have a higher trunk fat percentage by +1.23% to +4.21%, and lower ALM by –0.81 kg to –2.63 kg with respect to the young group in both sex, indicating a redistribution of the regional body composition compartments as an expression of increased central adiposity and sarcopenia.
Conclusions: Our study highlighted that across the lifespan of an individual with obesity, there is a sort of redistribution of body composition compartments; namely an increased fat trunk accumulation and a decrease in muscle mass in the extremities. The central obesity and sarcopenia may have negative health consequences (i.e., insulin resistance, inflammation, high fall risk) in the absence of any meaningful changes in BMI. Accordingly, the use of the latter (i.e. BMI) becomes useless and misleading, therefore future research is needed to identify new tools that are able to detect these changes in this specific population.



* Different color indicate mean difference at p<0.05.

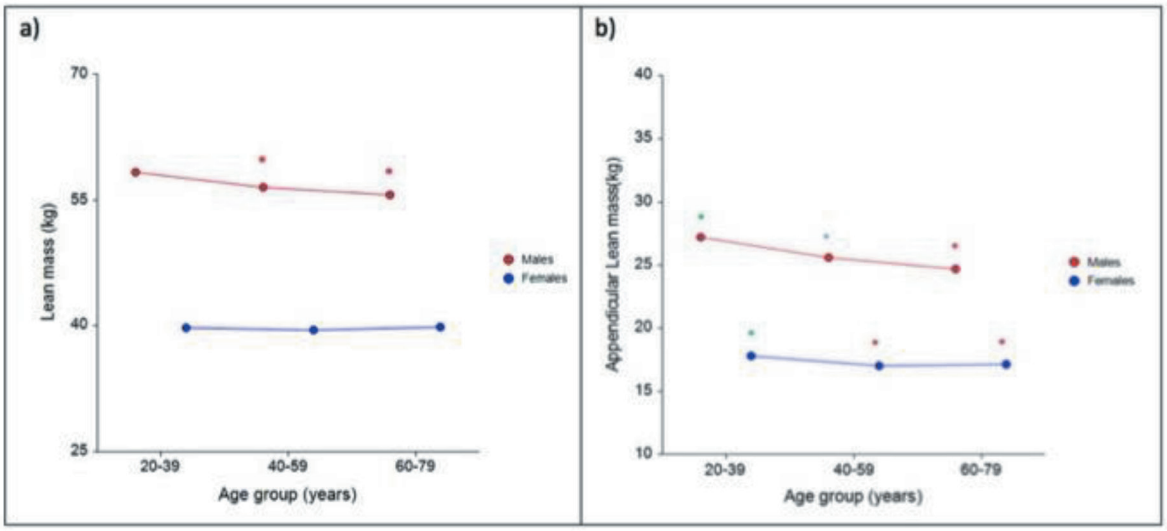
Fig. 1. Body fat (kg) (a) and body fat percentage (b) across age groups in males and females.

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* Different color indicate mean difference at p<0.05.

Fig. 2. Trunk fat (kg) (a) and trunk fat percentage (b) across age groups in males and females.



* Different color indicate mean difference at p<0.05.

Fig. 3. Lean mass (kg) (a) and appendicular lean mass (b) across age groups in males and females.

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PO4.066

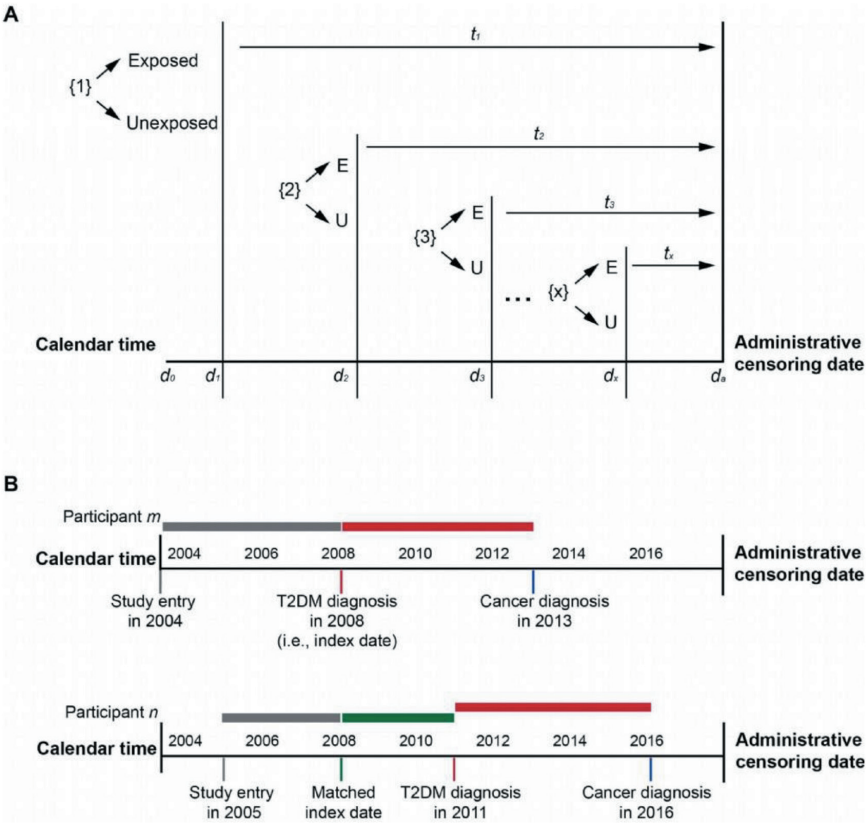
New-onset type 2 diabetes and cancer risk independent of body mass index: a matched cohort analysis (China Kadoorie Biobank)

Wang, M.[1]; *Tipping, O.*[2]; *Shen, B.*[3]; *Zou, S.*[3]; *Zhao, S.*[3]; *Martin, R. M.*[4]; *Sperrin, M.*[5]; *Renehan, A. G.*[6]

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[2]Division of Cancer Sciences, School of Medical Science, Faculty of Biology, Medicine and Health, University of Manchester; Cancer Research UK, Manchester Cancer Research Centre, Manchester, UK
[3]Department of General Surgery, Pancreatic Disease Centre, Ruijin Hospital, Shanghai Jiao Tong University School of Medicine; Research Institute of Pancreatic Diseases, Shanghai Key Laboratory of Translational Research for Pancreatic Neoplasms, Shanghai Jiao Tong University School of Medicine; State Key Laboratory of Oncogenes and Related Genes, Institute of Translational Medicine, Shanghai Jiao Tong University, Shanghai, China
[4]Department of Population Health Sciences, Bristol Medical School, University of Bristol; Medical Research Council (MRC) Integrative Epidemiology Unit, University of Bristol; National Institute for Health Research (NIHR) Bristol Biomedical Research Centre, University Hospitals Bristol and Weston NHS Foundation Trust and the University of Bristol, Bristol, UK
[5]Centre for Health Informatics, Division of Informatics, Imaging and Data Sciences, School of Health Sciences, Faculty of Biology, Medicine and Health, University of Manchester; National Institute for Health Research (NIHR) Manchester Biomedical Research Centre, Manchester, UK
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Introduction: In China, the prevalences of obesity and type 2 diabetes mellitus (T2DM) are rapidly increasing. There is evidence, mainly from Western populations, that T2DM is associated with at least six adult cancer types (gallbladder, liver, pancreas, endometrium, colorectum, and postmenopausal breast). In turn, these are obesity-related cancers (ORCs) such that it is unclear whether the T2DM-cancer associations reflect the mutual risk factor of obesity. Several other biases (listed in the Methods) also affect interpretation. Here, we determine T2DM-cancer associations in a large Chinese cohort addressing the above limitations in the literature.
Methods: Using the China Kadoorie Biobank (512,724 participants recruited between 2004 and 2008), we designed a study to reduce biases by: (i) including only new-onset T2DM to avoid immortal time (IMT) bias (i.e. prevalent T2DM being treated as 'exposed'); (ii) employing sex-specific sequential longitudinal matching on risk age, study region, and critically, body mass index (BMI) to address confounding; (iii) restricting analysis in pre-diagnosis BMI to mitigate reverse causation (a substantial weight loss following T2DM diagnosis); and (iv) evaluating detection time bias (present in early stages post-T2DM diagnosis due to more frequent health examinations in clinical settings). First primary incident cancer was the outcome of interest. Hazard ratios (HRs) and 95% confidence intervals (CIs) were estimated separately in men and women using a stratified Cox model with time-split coefficients for the time window within and beyond 12 months, adjusting for shared demographic and lifestyle risk factors.
Results: Following 1-3 matched without replacement, a total of 8,657 men and 13,680 women with new-onset T2DM were retained in the exposed group. During follow-up through December 31, 2018, 1,506 incident cancers in men and 1,844 in women were identified. After accounting for early detection bias within the first 12 months post-diagnosis, T2DM was significantly associated with increased risk for total cancer (HR 1.57, 95% CI: 1.38–1.79 in men; HR 1.30, 95% CI: 1.15–1.47 in women), ORCs (HR 1.75, 95% CI 1.38-2.21 in men; HR 1.35, 95% CI: 1.11-1.64 in women), digestive accessory organ cancers (HR 2.20, 95% CI 1.58-3.07 in men; HR 3.01, 95% CI: 1.99-4.55 in women), and digestive tract organ cancers in men (HR 1.34, 95% CI: 1.07-1.68). Site-specific risks were significantly elevated for liver cancer (HR 2.10, 95% CI: 1.41–3.11 in men; HR 2.47, 95% CI: 1.47–4.14 in women), pancreatic cancer (HR 2.54, 95% CI: 1.36–4.76 in men; HR 3.98, 95% CI: 1.94–8.17 in women), and lung cancer in men (HR 1.55, 95% CI: 1.17-2.06). These findings were robust across sensitivity analyses, including stricter matching with a narrower caliper, an increased matching ratio, and analyses restricted to smoking- and alcohol-naïve women.
Conclusions: Having purposefully matched for BMI and accounting for several potential biases, new-onset T2DM was associated with long-term increased risk of liver and pancreatic cancers in both sexes in a large Chinese cohort. It remains to be tested whether better diabetes control reduces these risks.

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(A) The schema of sequential allocations of participants to the exposed or unexposed group. The relevant time scale for matching was the calendar time (d). Follow-up for outcomes (time scale t) began after the assigned index date dx. The possible maximum follow-up time for every participant was the time lag between da and dx, where da was the administrative censoring date. (B) Illustration of two hypothetical participants in a matched pair, where participant m was the initially exposed individual and participant n the matched unexposed. A per-protocol analysis is presented here, where participant n was followed up as unexposed (indicated by green bar) from the assigned index date to a new diagnosis of T2DM in this matched pair, and in another stratum, as an exposed individual with new follow-up since T2DM diagnosis (indicated by red bar).

Fig. 1. Illustration of the longitudinal matching design in the present study.

PO4.067

Impact of a Low Glycemic Index Diet on Interleukins and Adiponectin Levels in Patients with Atherosclerotic Coronary Artery Disease

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Department of Cardiology, Republican Specialized Scientific Practical Medical Center of Therapy and Medical Rehabilitation

Introduction: Atherosclerotic coronary artery disease (CAD) is associated with chronic inflammation and metabolic dysregulation, contributing to disease progression and adverse outcomes. Pro-inflammatory cytokines such as IL-1, IL-6, IL-1β, and TNF-α, alongside anti-inflammatory markers like IL-10 and adiponectin, are key mediators in this process. Dietary interventions, such as a low glycemic index (LGI) diet, have been proposed as potential strategies to modulate inflammatory pathways and improve metabolic health. This study evaluated the impact of an LGI diet on serum cytokines and adiponectin levels in patients with CAD over a 12-week period.

Methods: This prospective study enrolled 130 patients diagnosed with atherosclerotic CAD (mean age: 58 ± 8 years; 64% male). Participants were randomized into two groups: an LGI diet group (n=65) and a standard diet group (n=65). Serum levels of IL-1, IL-6, IL-10, IL-1β, TNF-α, and adiponectin were measured at baseline and after 12 weeks using enzyme-linked immunosorbent assays (ELISA). Statistical analysis included paired and unpaired t-tests for within- and between-group comparisons, repeated measures ANOVA for longitudinal changes, and Pearson correlation to assess inter-variable associations. Statistical significance was defined as $P<0.05$.

Results: At baseline, there were no significant differences in cytokine or adiponectin levels between the two groups. After 12 weeks, the LGI diet group demonstrated significant reductions in pro-inflammatory markers. IL-1 decreased from 32.5 ± 6.8 pg/mL to 26.1 ± 5.4 pg/mL ($P<0.001$), IL-6 from 12.4 ± 2.3 pg/mL to 9.8 ± 2.1 pg/mL ($P<0.001$), IL-1β from 18.2 ± 3.1 pg/mL to 14.5 ± 2.8 pg/mL ($P<0.001$), and TNF-α from 22.4 ± 3.9 pg/mL to 17.2 ± 3.5 pg/mL ($P<0.001$). Anti-inflammatory IL-10 increased significantly from 8.9 ± 1.4 pg/mL to 11.5 ± 1.8 pg/mL ($P<0.001$), while adiponectin rose from 7.2 ± 1.1 µg/mL to 9.4 ± 1.3 µg/mL ($P<0.001$). The standard diet group showed no significant changes in any parameter: IL-1 (33.1 ± 6.5 pg/mL to 32.8 ± 6.2 pg/mL, $P=0.78$), IL-6 (12.6 ± 2.4 pg/mL to 12.2 ± 2.3 pg/mL, $P=0.12$), IL-1β (18.5 ± 3.2 pg/mL to 18.1 ± 3.1 pg/mL, $P=0.52$), TNF-α (22.7 ± 3.8 pg/mL to 22.3 ± 3.7 pg/mL, $P=0.63$), IL-10 (8.7 ± 1.5 pg/mL to 9.0 ± 1.6 pg/mL, $P=0.18$), and adiponectin (7.0 ± 1.2 µg/mL to 7.2 ± 1.1 µg/mL, $P=0.23$).

Conclusion: A 12-week LGI diet significantly reduced pro-inflammatory cytokines (IL-1, IL-6, IL-1β, TNF-α) and increased anti-inflammatory markers (IL-10, adiponectin) in patients with CAD, while no changes were observed in the standard diet group. These findings suggest that the LGI diet is an effective dietary strategy to mitigate inflammation and improve metabolic health in CAD patients. Long-term studies are needed to evaluate the sustainability of these effects and their impact on cardiovascular outcomes.

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PO4.068

Weight reduction with tirzepatide use by baseline HbA1c category in adults with overweight or obesity and type 2 diabetes in SURMOUNT-2

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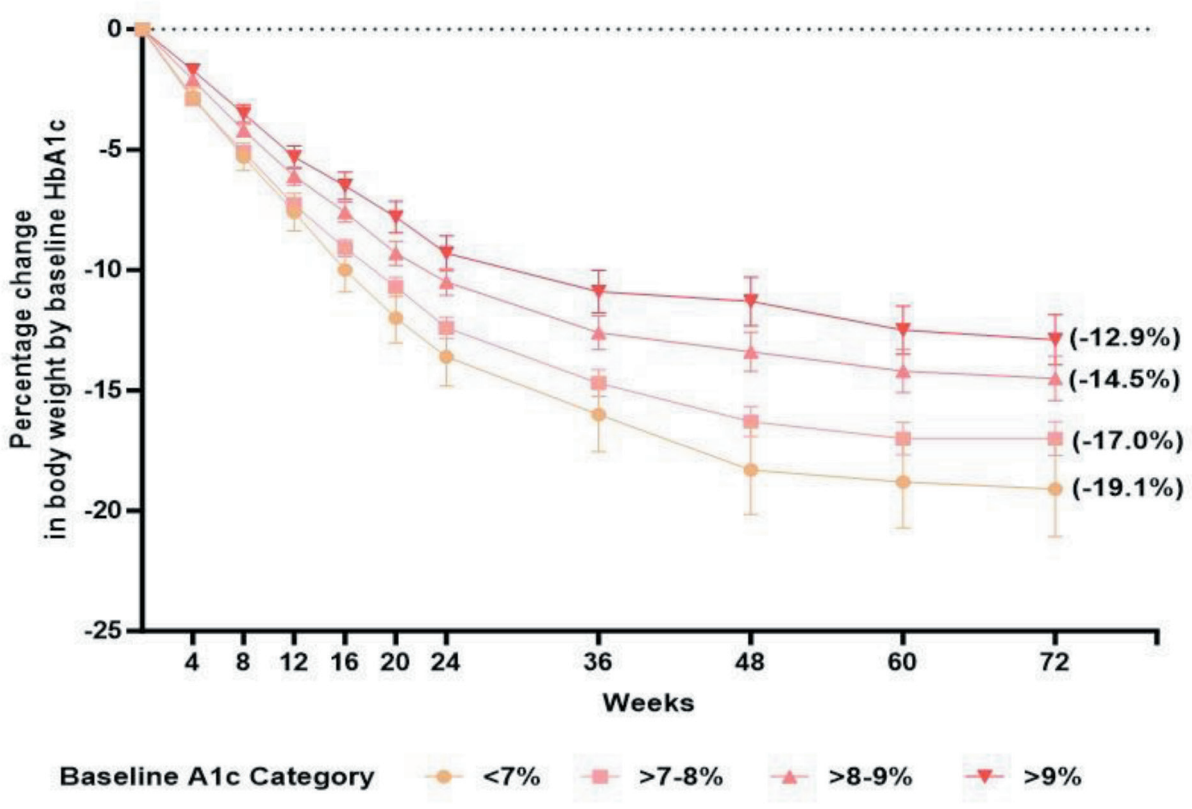
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In the SURMOUNT-2 (SM-2) trial, tirzepatide (TZP), a once weekly GIP/GLP-1 receptor agonist, significantly reduced body weight (BW) in adults with overweight/obesity and type 2 diabetes (T2D) in conjunction with a reduced calorie diet and increased physical activity. This post-hoc analysis assessed weight reduction by baseline HbA1c (A1c) at 72 weeks in the SM-2 trial.

Participants were grouped by baseline A1c into 4 categories (A1c: <7%, ≥7 to 8%, ≥8 to 9%, and ≥9%). Percent changes in BW from baseline to week 72 were assessed in participants treated with TZP 15mg (N=309), TZP 10mg (N=309), or placebo (PBO) (N=311), with at least one non-missing post-baseline measure. Changes in A1c from baseline to week 72 were assessed in participants treated with TZP 15 mg (N=300), TZP 10 mg (N=301) or PBO (N=290) with at least one non-missing post-baseline measure. A mixed model with repeated measures (MMRM) was performed to estimate the mean percent change from baseline to week 72 in weight, and A1c, with the model including country, sex, baseline value, type of AHM used, treatment, visit, and treatment by visit interaction for each of the baseline A1c groups. In addition, logistic regression with missing value imputed by MMRM, using the efficacy estimand (excluding off-treatment data) was conducted to summarize the proportion of participants achieving ≥15% BW reduction from baseline.

At 72 weeks, TZP 15 mg was associated with significant decreases in BW from baseline and vs PBO across all A1c categories. Mean percentage weight loss was lower in the groups with a higher baseline A1c; A1c <7% (-19%), A1c ≥7 to <8% (-17%), A1c ≥8% to 9% (-15%), A1c ≥9% (-13%) (Figure). Similar results were seen for the TZP 10 mg arm. All A1c categories showed decreases from baseline in A1c with a more pronounced reduction in the higher A1c groups, baseline A1c <7% (-1.2), A1c ≥7 to <8% (-1.9), A1c ≥8% to 9% (-2.4), A1c ≥9% (-3.4). Significantly greater achievement of >15% BW reduction was seen with all categories on TZP 15 mg vs PBO, with lower A1c categories showing the highest number of predicted achievers at 72 weeks, A1c <7% (70%), A1c ≥7 to <8% (58%), A1c ≥8% to 9% (47%), A1c ≥9% (38%).

In this post-hoc analysis, significant reductions in BW and A1c were seen with TZP treatment in people living with obesity and T2D in SM-2 regardless of baseline A1c category. Of particular interest is the observation that the glucose lowering association of TZP was not proportional to changes in BW from baseline.



Data are LS mean (SE). Data were analysed using the efficacy analysis set (data during treatment period excluding data after treatment discontinuation) from the MITT population (randomised participants with any dose of study drug).

Fig. 1. Percentage change of body weight by baseline HbA1c category (<7%, 7 to 8%, 8 to 9%, and ≥9%) for TZP 15mg.

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PO4.069

Screening for Hepatic Fibrosis Using The FIB-4 Biological Score in Obese Patients: A Case Report of 70 Patients

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Introduction: Non-alcoholic fatty liver disease (NASH) has become the most widespread liver disease in the world, mainly due to obesity and metabolic syndrome. Its increasing incidence makes it a major cause of liver disease morbidity and mortality, with projections suggesting that it could become the main reason for liver transplantation in Western countries. The management of NAFLD presents challenges, particularly in terms of classification, early diagnosis and prevention.

Methods: We conducted a retrospective study, selecting the records of patients followed for obesity over a 2-year period. All patients over 18 years of age, with a BMI greater than 30kg/m2, without diabetes or hypertension were included. After eliminating patients with chronic liver disease, thrombocytopenia or elevated liver enzymes associated with other pathologies, notably muscular, drug or thyroid disease, we collected clinical and biological data. The FIB-4 score was calculated according to the formula: (age (years) × ASAT (U/L)/platelets (PLT) (109/L) × √ALAT (U/L)).

Results: The majority of patients were relatively young adults, the most frequent age group being (30-69 years).

In our series, 67 women (96%) and 3 men (4%) were predominantly female. Our patients' body mass index ranged from 32 to 60 kg/m². We found that in 50 patients, a FIB-4 score below 1.30 was associated with a high negative predictive value, suggesting that severe fibrosis was unlikely in these cases. In the zone of uncertainty, corresponding to FIB-4 values between 1.30 and 2.67, we identified 18 cases, and which require further evaluation to accurately determine the level of fibrosis. Two cases had a positive predictive value for advanced fibrosis, underlining the need for early and specialized management. Longitudinal studies assessing the prognostic significance of lesions in chronic liver disease have consistently concluded that the degree of hepatic fibrosis is the main lesion associated with patient prognosis. They have shown that hepatic morbidity and mortality increase significantly in patients with advanced hepatic fibrosis.

Conclusion: Our study highlights the diagnostic value of the FIB-4 score in the assessment of liver fibrosis in obese patients. These results may help to improve clinical management by identifying patients at risk of severe fibrosis and providing them with appropriate follow-up and treatment.

PO4.070

Use and Effectiveness of Once-weekly Semaglutide in US Adults with Overweight or Obesity in Clinical Practice

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Introduction: The Semaglutide Treatment Effect in People with obesity (STEP) clinical trial programme has demonstrated the efficacy of semaglutide 2.4 mg for achieving weight loss in people living with overweight or obesity.[1] In this study, we investigated the effectiveness of semaglutide for weight loss in a real-world setting. We assessed weight loss and biomarkers in real-world US cohorts of individuals who received semaglutide for weight management for 6 or 12 months.

Methods: Adults (≥18 years old) who were semaglutide-naive and had a first claim for semaglutide for weight management (index date, day 0) between 4 June 2021 and 1 January 2024 were identified in the IQVIA Ambulatory Electronic Medical Records database, linked to PharMetrics® Plus. Individuals required ≥90 days of continuous enrolment pre-index and either 6 or 12 months' follow-up; ≥1 weight measurement between day −90 and day 15; and a body mass index (BMI) ≥30 kg/m², or ≥25 kg/m² plus ≥1 obesity-related complication (ORC). Weight loss was assessed in individuals who used semaglutide for 6 or 12 months (defined as no medication gap of >90 days), and proportional weight change was compared between subgroups defined by the presence of type 2 diabetes (T2D) and cardiovascular disease (CVD), and overall number of ORCs, using the Wilcoxon signed rank exact test. In addition, changes in the cardiometabolic risk factors BMI, glycated haemoglobin (HbA1c), total cholesterol, and blood pressure (BP) were assessed.

Results: In total, 802 and 411 eligible individuals had 6 and 12 months' follow-up, respectively. In each group, 80% of individuals were women and 84% were aged ≥35 years. Mean age was 46 years (6-month group)/47 years (12-month group); mean BMI was 38 kg/m² in each group. At baseline, 6% of individuals had overweight, 28% (6-month group)/31% (12-month group) had obesity class I, 27% (6-month group)/24% (12-month group) had class II and 39% had class III. Twelve months after treatment initiation (n=103), the last recorded dose of semaglutide was 1.0 mg in 2.9% of individuals, 1.7 mg in 12.6% and 2.4 mg in 84.5%. After 6 months, individuals on semaglutide treatment experienced significant mean weight loss of 9.0% (standard deviation [SD]: 6.2; n=276; p<0.001) from baseline; at 12 months, mean weight loss from baseline was 13.9% (SD: 9.2; n=103; p<0.001). Subgroups with ORCs experienced statistically significantly less weight loss than those with no ORCs, but there was no significant difference in weight loss between subgroups with and without T2D and CVD (Table 1). There were significant improvements from baseline in BMI, HbA1c, total cholesterol levels and BP at 6 and 12 months (Table 2).

Conclusion: In US real-world cohorts receiving semaglutide for weight management, there was significant weight loss from baseline, which was of a similar magnitude to the results observed in the STEP clinical trials. Significant improvements in cardiometabolic biomarkers considered to be associated with a risk of developing ORCs were also observed.

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Tab. 1. Percentage weight loss at 6 and 12 months from baseline in individuals using semaglutide: full cohort and ORC subgroups.

	Number of individuals	Weight change from baseline, %, mean (SD)	*p* value
6 months after treatment initiation			
Full cohort	276	−9.0 (6.2)	<0.001 (vs baseline)
ORC status[a]			
0 ORCs	42	−10.9 (5.9)	–
≥1 ORC	234	−8.6 (6.3)	0.01 (vs 0 ORCs)
≥2 ORCs	185	−8.3 (6.2)	0.006 (vs 0 ORCs)
≥3 ORCs	133	−8.0 (6.0)	0.002 (vs 0 ORCs)
T2D status			
No T2D	259	−8.9 (6.3)	–
T2D	17	−9.5 (5.6)	0.5 (vs no T2D)
CVD status			
No CVD	150	−9.3 (6.1)	–
CVD	126	−8.6 (6.4)	0.3 (vs no CVD)
12 months after treatment initiation			
Full cohort	103	−13.9 (9.2)	<0.001 (vs baseline)
ORC status[a]			
0 ORCs	13	−18.8 (9.7)	–
≥1 ORC	90	−13.1 (9.0)	0.02 (vs 0 ORCs)
≥2 ORCs	74	−12.9 (8.9)	0.016 (vs 0 ORCs)
≥3 ORCs	53	−11.7 (9.1)	0.007 (vs 0 ORCs)
T2D status			
No T2D	96	−14.1 (9.4)	–
T2D	7	−11.2 (6.2)	0.6 (vs no T2D)
CVD status			
No CVD	50	−14.6 (9.1)	–
CVD	53	−13.2 (9.4)	0.4 (vs no CVD)

[a]ORCs were asthma, atherosclerosis, atrial fibrillation and flutter, cardiac arrest, cardiomyopathies, cerebrovascular disease, deep vein thrombosis and pulmonary embolism, dyslipidaemia, GERD, HF, HFpEF, hypertension, hypertensive disease, IHD, knee OA, musculoskeletal pain, OSA, PAD, PCOS, prediabetes, psoriasis, T2D and urinary incontinence.

Individuals with a record of the following in the 12 months pre-index were excluded: weight loss medication, receipt of any glucagon-like peptide-1 receptor agonist, bariatric surgery or endoscopy.

CVD, cardiovascular disease; GERD, gastro-oesophageal reflux disease; HF, heart failure; HFpEF, heart failure with preserved ejection fraction; IHD, ischaemic heart disease; OA, osteoarthritis; OSA, obstructive sleep apnoea; ORC, obesity-related complication; PAD, peripheral artery disease; PCOS, polycystic ovary syndrome; SD, standard deviation; T2D, type 2 diabetes.

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Tab. 2. Absolute changes in biomarkers at 6 and 12 months from baseline in individuals using semaglutide.

	Number of individuals	Change from baseline, mean (SD)	*p* value for follow-up versus baseline
6 months after treatment initiation			
BMI (kg/m²)	273	−3.0 (2.3)	<0.001
HbA_{1c} (%)	29	−0.5 (0.7)	<0.001
Total cholesterol (mmol/L)	28	−20.9 (40.8)	0.026
SBP (mmHg)	240	−4.2 (14.5)	<0.001
DBP (mmHg)	240	−2.1 (10.5)	0.003
12 months after treatment initiation			
BMI (kg/m²)	103	−4.9 (3.5)	<0.001
HbA_{1c} (%)	8	−0.5 (0.3)	0.014
Total cholesterol (mmol/L)	21	−20.6 (32.6)	0.008
SBP (mmHg)	88	−3.6 (14.9)	0.027
DBP (mmHg)	88	−1.0 (11.3)	0.3

Individuals with a record of the following in the 12 months pre-index were excluded: weight loss medication, receipt of any glucagon-like peptide-1 receptor agonist, bariatric surgery or endoscopy.

BMI, body mass index; DBP, diastolic blood pressure; HbA_{1c}, glycated haemoglobin; SBP, systolic blood pressure; SD, standard deviation.

PO4.071

From guideline to practice: implementing an integrated care approach for obesity in children and adults within one family; a pilot

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Introduction: The rising prevalence of overweight and obesity in children and adults is an urgent public health challenge. The Dutch national healthcare guideline 'Overweight and Obesity in Adults and Children' advises an integrated network approach as organisational structure for effective support and care. Two national standards – one for children and one for adults – are being implemented nationally, but they do not optimally support families where both generations (adult and child) need care. As the prevalence of overweight and obesity within one family is high, municipalities increasingly seek a combined network approach. However, clear guidance on integrating both models in practice is lacking. Therefore, this study explores the development and early implementation of a combined integrated care approach for overweight and obesity, as well as related comorbidities, in both children and adults within one family.
Methods: After forming a project group (Stage 1), a learning community (LC) with five municipalities was established (Stage 2). Municipalities were selected based on geographical spread, financial resources, relationships with various national health insurers, and willingness and local support to adopt both standards. Three were working with both standards, one would start with both, and one had been implementing the children's standard.
Results: Analysis of existing standards revealed theoretical and operational differences and similarities between both standards (Stage 3). The LC sessions identified implementation challenges (Stage 4), including financial resources, capacity and expertise, policy integration and procedures. We then co-created an implementation plan with municipalities (Stage 5) to execute a pilot (Stage 6). In this pilot, we will identify key implementation barriers and facilitators (Stage 7). We will connect barriers to the Consolidated Framework for Implementation Research (CFIR) (Stage 8) to identify tailored strategies for practice (Stage 9). We will differentiate between guideline-specific barriers for evidence-based guideline content solutions, and implementation-specific barriers by selecting evidence-based strategies, using the CFIR-ERIC matching tool and municipalities input. Finally, we will identify key principles and lessons learned for realising a combined integrated care approach within one family (Stage 10).
Conclusion: This study underscores the need for a combined approach to effectively offer support and care for overweight, obesity, and related comorbidities, in both children and adults within one family. The initial results show the potential of supporting entire families rather than individuals in isolation, using a combined approach. Achieving this requires cross-sector collaboration and local adjustments to existing policies and funding mechanisms to facilitate combined care. Next, we aim to expand this approach to more families in current and other municipalities, continuously refining the combined integrated care approach.

PO4.072

The Impact of Bariatric-Metabolic Surgery on Biopsychosocial Wellbeing: A Qualitative Pilot Study of the DigiWELL Project

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Objective: A healthy lifestyle is associated with increased longevity, reduced risk of chronic disease, and enhanced quality of life. Despite WHO guidelines, obesity rates continue to rise. Bariatric-metabolic

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surgery is recommended for individuals with a BMI ≥ 35 kg/m² when conservative treatments prove ineffective. Whilst post-surgery dietary guidelines are established, there is limited emphasis on psychological support and physical activity. This study investigates patients' perceptions of their biopsychosocial well-being following bariatric surgery, with a focus on exercise interventions and the role of digital technologies in supporting post-surgical behavioral modifications. The main objective of this pilot study was to validate a semi-structured interview protocol for assessing well-being and exercise experiences.

Methods: Five bariatric patients (3 females, 2 males) participated in semi-structured qualitative interviews moderated by a researcher with subsequent observer follow-up questions. Data collection employed triangulation of techniques and researchers to ensure consistency and reliability. The discussions were audio-recorded for subsequent verbatim transcriptions. The transcripts were coded using MAXQDA 24 software, where independent open coding was conducted as developed by Straus and Corbin (Strauss, A., & Corbin, J. M., 1990), and primary themes and subthemes were established. The results were analyzed by four researchers using a qualitative thematic analysis.

Results: Content analysis confirmed that bariatric patients encounter many challenges that impede their biopsychosocial wellbeing, thus requiring attention from a multidisciplinary team. Moreover, bariatric patients are increasingly utilizing digital technologies to implement lifestyle modifications, primarily for monitoring purposes and social support. Key recommendations for enhancing the interview protocol encompass reducing the number of questions, organizing them thematically, implementing icebreaker techniques, and utilizing AI for verbatim transcription. Reflective thematic analysis is proposed as a methodology for subsequent evaluations.

Conclusion: The pilot study enhanced the semi-structured interview protocol, thereby increasing its validity and reliability. The revised format aims to improve participant engagement, while AI-assisted transcription augments the efficiency of subsequent analysis. The primary topics to be addressed in the main investigation have been identified: bariatric surgery and biopsychosocial well-being, context of surgery and study inclusion, digital technology utilization, and physical activity interventions.

Conflict of Interest: None Disclosed.

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PO4.073

Nutritional and functional outcomes in trials of nutrient-stimulated hormone-based therapy – A systematic mapping review

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Introduction: Current trials are exploring nutrient-stimulated hormone-based therapies (NUSHs) for weight loss in individuals with overweight/obesity. Reviews highlight concerns about excessive lean mass loss and sarcopenia due to reduced energy, micronutrients, and protein intake, especially if adequate nutritional strategies are not implemented (1,2). The evaluation of nutritional and functional outcomes in NUSH trials remains unclear. We conducted a systematic mapping to assess the presence of nutritional and functional outcomes in randomized controlled trials investigating NUSH.

Methods: We conducted a systematic mapping search on the Cochrane Central Register of Controlled Trials, which includes ClinicalTrials.gov and the International Clinical Trials Registry Platform for interventional trials of NUSH registered from inception to December 31, 2023. We excluded non- and quasi-randomized trials, phase I trials, trials that did not include body weight as a primary or secondary outcome, trials with an intervention duration of less than 6 months, and trials that did not include a BMI threshold of ≥ 25 kg/m² in their eligibility criteria. Outcomes included dietary intake, eating behavior, body composition, physical performance, muscle strength, bone health, and levels of vitamins, trace elements, albumin, prealbumin, hemoglobin.

Results: The search identified 2284 trials, of which 417 were included in the analysis. The proportion of randomized controlled trials that included nutritional assessment other than body weight increased over time. Approximately, 20.4% reported measurements of body composition, 17.3% reported measurements of albumin/prealbumin/hemoglobin, and 17% reported assessment of dietary intake and eating behavior. Evaluations of bone health, physical performance, muscle strength, and measurements of vitamins/trace elements were reported in less than 5% of the total trials each.

Conclusion: The low prevalence of nutritional and functional assessments in clinical trials of NUSH leaves a significant evidence gap regarding the consequences of these drugs. As several novel NUSH are currently under development, future research should broaden its focus beyond weight management alone to address all aspects of the patient's nutritional status.

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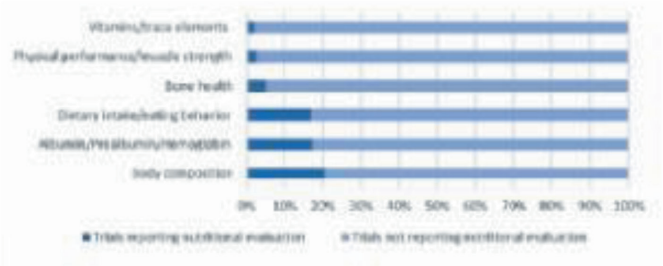


Fig. 1. Percentage of nutrient-stimulated hormone-based therapy clinical trials reporting nutritional and functional outcomes.

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PO4.074

The emerging role of H2S in obesity

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Introduction: The World Health Organization (WHO) defines obesity as a condition with an excessive fat accumulation which leads patients to have a body mass index (BMI) greater than 30. Nowadays obesity represents a main public health issue as it is associated with a multitude of complications. Over the last years the gasotransmitter hydrogen sulfide (H_2S) has caught the attention as a new promising signaling molecule due to its several physiological and pathophysiological roles in human disorders, including obesity and overweight [1].
Methods: Using PubMed and Scopus as the main databases, we reviewed all the information concerning the role of H_2S and different H_2S-donors in the pathophysiology of obesity.
Results: The role of H_2S in obesity seems to be explained through different mechanisms. It is observed that in the adipose tissue macrophages (ATMs) of mice with obesity, there is a depletion of H_2S that in turn promotes the Ca2+ influx through the store-operated Ca2+ entry (SOCE) pathway. These events lead overall to a proinflammatory condition that improves when H_2S levels are restored [2].Moreover H_2S seems to enhance lipolysis and to play a crucial role inhibiting lipid accumulation and limiting adipocytes differentiation [3].Another mechanism proposed involved the activation of a mediator of adipogenesis, the peroxisome proliferator activated receptor γ (PPARγ) and the inhibition of the phosphorylation of perlipin-1(plin-1), implicated in the lipolysis [4].So the intake of synthetic or natural H_2S-donors, like plants belonging to the family of Alliaceae (garlic and onion) and Brassicaceae (broccoli, cabbage, rocket) may enhance H_2S levels [5].
Conclusion: Overall the supplementation with H_2S-donors, used alone or in combination with conventional anti-obesity pharmacological therapies could represent a new opportunity towards improving obesity conditions. Specifically, the implementation of natural H_2S-donors in the diet could represent a new focus to be further studied.

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PO4.075

Bioimpedance visceral adiposity for glycemic dysregulation assessment – a retrospective study

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Objective: Visceral fat accumulation, unlike general or abdominal fat, is a distinct marker for cardiometabolic health risks. This study aimed to evaluate and validate the clinical utility of visceral fat rating (VFR), assessed through bioelectrical impedance analysis (BIA), as a predictor of prediabetes and type 2 diabetes mellitus (T2DM) in real-world scenarios, comparing its predictive value to traditional metrics like body mass index (BMI) and waist circumference (WC).
Methods: This retrospective cross-sectional analysis included data from 650 patients (513 women) with overweight or obesity, who visited the Department of Endocrinology, Diabetology, and Metabolic Diseases between July 2020 and December 2023. Anthropometric measures, including percentage body fat (PBF) and VFR, were obtained using a Tanita BIA device. Glycated hemoglobin (HbA1c) levels were measured from venous blood samples. Statistical methods included ANOVA, post-hoc analyses, and effect size estimation via Cohen's d and Fisher's Z-index.
Findings: VFR effectively distinguished patients among the Normal Glucose Metabolism (NGM), Prediabetes (PRE), and T2DM groups, showing large effect sizes. In women, VFR and WC emerged as the most effective discriminators, whereas BMI and PBF showed limited differentiation. For men, VFR was particularly strong in distinguishing between NGM and T2DM groups. Furthermore, VFR exhibited a robust and nearly linear correlation with HbA1c, outperforming traditional anthropometric measures.
Conclusion: VFR measured through BIA holds significant promise as a practical and reliable marker for assessing T2DM risk in clinical practice, surpassing BMI and WC. These findings support further efforts to standardize VFR in evidence-based medical practice.

PO4.076

Microbiota & Its Influence on Muscle Injury Recovery and Joint Inflammation in Obesity: A New Era in Nutrition & Physical Therapy

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Introduction: Practical evidence highlights the gut microbiota's role in modulating systemic inflammation, influencing nutrient availability, and enhancing immune function. These factors are crucial not only for muscle injury recovery and joint inflammation but also for addressing obesity-related complications. Obesity is associated with chronic low-grade inflammation and impaired tissue repair, which can hinder rehabilitation outcomes. This study investigates how practical dietary strategies that support gut health can enhance recovery from musculoskeletal injuries, reduce joint inflammation, and mitigate obesity-related barriers to physical therapy progress.
Methods: A cohort of patients with musculoskeletal injuries, including obese individuals, underwent a 4-week rehabilitation program. Evidence-based dietary guidelines were provided to promote gut health and address obesity-related inflammation. The recommendations included:

- Probiotic-rich foods (e.g., yogurt, kefir).
- Prebiotic fibers (e.g., oats, bananas).
- Anti-inflammatory nutrients (e.g., omega-3 fatty acids).

Outcomes assessed included pain reduction, range of motion, muscle strength, body composition, and inflammation markers.
Results: Patients who followed gut-health-focused dietary recommendations experienced faster reductions in muscle soreness, inflammation markers, and joint stiffness. Obese individuals showed improvements in body composition, reduced inflammation, and enhanced functional recovery compared to the control group. The addition of fermented foods and anti-inflammatory nutrients significantly improved subjective pain scores, mobility, and adherence to physical therapy protocols.
Conclusion: Optimizing gut health through dietary modifications can accelerate recovery from muscle injuries, reduce joint inflammation, and address obesity-related challenges in rehabilitation. By mitigating chronic inflammation and promoting tissue repair, this approach enhances the efficacy of physical therapy interventions. Integrating gut-health strategies into rehabilitation protocols offers a novel and practical solution for improving outcomes in patients with obesity and musculoskeletal conditions.

Conflict of Interest: None disclosed.

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PO4.077

Clinic, Ambulatory and Home Blood Pressure Monitoring for Metabolic Syndrome: Time to change the definition?

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Background and Objectives: Metabolic syndrome (MetS) is considered as a global epidemic, affecting around one-quarter of people worldwide and being a significant cause of morbidity and mortality. As so, the diagnosis of MetS is crucial, as it allows early intervention and management. Hence, the main aim of this study was to examine any possible BP differences, based on ambulatory BP (ABPM), home BP (HBPM) and office BP (OBPM) measurements, on those with and without MetSa and investigate if any of these measurements better correlate with Mets.
Materials-Methods: The study population is consisted of 282 individuals attending the Hypertension Clinic. ABPM, OBPM, HBPM performed in all patients, as well as cardiovascular risk assessment and pulse wave velocity.
Results: A total of 282 (39.9% men) subjects, aged 56.8±15.8 years were analysed, 60.8% of the study population had metabolic syndrome according to the IDF criteria. The group with metabolic syndrome had statistically significant higher SBP, in all BP measurements ($p<0.05$),
significantly higher LV hypertrophy prevalence (49.2% vs. 22.7%, $p=0.005$), ASCVD (9.8 vs. 9, $p=0.016$) and Framingham risk scores (6.8 vs. 3.7, $p=0.002$). In the univariate analysis, metabolic syndrome showed significant correlation only with the average 24h SBP, SBP during daytime and nighttime, the mean office SBP and the average home SBP in the morning ($p<0.05$). No statistically significant differences were observed for any of the DBP measurements. Finally, 50.5% of metabolic syndrome patients had sustained hypertension, while 15.2% presented masked and 11.5% white coat hypertension. Furthermore, most of the patients presented non-dipping hypertension (56.4%).
Conclusion: The results show the importance of out-of-office BP measurements in the diagnosis of Mets, as SBP not only from office but also from out-of –office is a significant determinant and the no importance of DBP. The need of out-of-office measurements are revealed also from the high rates of different phenotypes (masked, white-coat, non-dipping status).

PO4.078

Supplementing lies. Placebo responses and effects associated with weight loss supplementation: a systematic review and meta-analysis

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Introduction: Obesity is a multifaceted chronic condition characterized by an excessive fat deposits that can have detrimental effects on overall health. Several systematic reviews have examined the utilization of weight loss supplements. Nevertheless, even when these reviews incorporate placebo-controlled studies, they often overlook the implications of employing a placebo intervention. The term "placebo effects" denotes the physiological and psychological changes resulting specifically from placebo application. Therefore, it is represented as the difference between placebo and non-treatment/natural history groups. When no control group for the placebo one is included in a study design, any changes in the placebo group can be called the placebo response. Thus, the placebo response is defined as all health changes resulting from the inactive treatment, including regression towards the mean and the natural course of the disease.
Methods: PubMed, Cochrane, Embase, clinicaltrials.gov, clinicaltrialsregister.eu and TripDatabase were searched for relevant articles. Double-blind studies focused on comparing a weight loss supplement with a placebo or a placebo supplement to a natural history group published in English were included. Reviews, meta-analyses, secondary studies not based on a systematic review, letters to the editor, and conference communications were excluded.
Results: After the final screening, 37 studies were included in the review. Of these, 36 were pooled for the meta-analysis. A significant placebo response was observed for body mass (SMD [95%CI] = 0.17 [0.06, 0.28]), Body Mass Index (BMI) (SMD [95%CI] = 0.22 [0.05, 0.40]), as well as waist (SMD [95%CI] = 0.35 [0.02, 0.67]) and hip circumferences (SMD [95%CI] = 0.43 [0.11, 0.75]). Additionally, the analysis showed trends (approaching significance) toward the placebo effect on trunk fat mass (SMD [95%] = 0.22 [-0.08, 0.51]) and body fat percentage (SMD [95%CI] = 0.12 [-0.05, 0.29]), and the nocebo effect on fat-free mass (SMD [95%CI] = 0.07 [-0.07, 0.20]).
Conclusion: The use of inactive "weight loss supplements" can lead to reductions in body weight and even improvements in body composition. These may be driven by expectations or prior experiences of the individuals involved. On the other hand, individuals, influenced by the illusory invulnerability effect, may not fully engage in necessary lifestyle changes, such as increased physical activity. This can hinder weight loss and lead to loss of fat-free mass (i.e. muscle mass). This also raises the critical question of whether an active supplement truly represents an effective weight loss intervention, or if its impact is merely an enhancement of the placebo effect. Unfortunately, this question cannot be answered definitively without the inclusion of an appropriate control group, such as a natural history or no-intervention group, to account for the placebo effect.

Conflict of Interest: None

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PO4.079

The combination of dietetic and psychotherapeutic approaches to the management obesity among women

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Introduction: We know that emotional factors influence on weight gain. That is why we should use complex approach to help people with overweight. Our inquiry revolves around identifying to determine the effectiveness of group cognitive behavioral therapy (CBT) in combination with nutritional model correction for body weight management in obese women.
Methods: Women with BMI>30 kg/m2 and aged 18 years or older rigid to medical nutrition therapy were invited to program after motivative consultation. There were 8 CBT meeting for long 2.5 hours during 2 months by medical psychologist and a registered dietitian. Descriptive statistics were employed, utilizing the Student's t-test for analysis.
Results: Overall, we included 20 women with obesity and a median age of 46.6±12.3 years. There were significant differences in the body weight: 97.69±14.22 vs 93.36±13.95 kg ($p<0.001$) after 2 months intervention. Also according of CARDIA test after 2 months we founded decreasing of the frequency of detection of the pathological significance of body weight ($p<0.001$), episodes of loss of control over food intake ($p<0.001$), distress due to loss of control over food intake ($p<0.001$). There were significant differences in results of the Maastricht Questionnaire (short version): 5.6±3.89 vs 4.1±2.66 ($p=0.001$), of the University of California, Los Angeles loneliness scale: 34.9±12.61 vs 29.9±7.57 ($p=0.007$). As a result of the intervention there was a significant decreasing in total scores characterizing feelings of guilt ($p<0.001$), and also a decrease in the feeling of shame ($p<0.001$).

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Conclusion: The psychoemotional state is a significant impact on eating behavior and body weight regulation. That is why we should more often using combinative intervention to effectively help women suffering from obesity.

PO4.080

Impact of Caloric Restriction on Diabetes Remission in Korean Adults with Obesity

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Aim: Without any specific interventions, type 2 diabetes mellitus (T2DM) remission is infrequent. This pilot study aimed to investigate whether weight loss via a dietary intervention would achieve diabetes remission in East Asians.
Methods: Patients with T2DM for ≤ 6 years and a body mass index ≥ 25 kg/m² received a calorie-restricted dietary intervention for 12 weeks. All meal packages for the low-calorie diet were delivered to the home. The primary outcome was diabetes remission, defined as a glycated hemoglobin A1c (HbA1c) level < 6.5% for at least 3 months after discontinuing all glucose-lowering drugs. Diabetes remission was also assessed by continuous glucose monitoring and the 75-g oral glucose tolerance test (OGTT).
Results: A total of 24 participants completed the 12-week intervention. Weight change at week 12 was –8.7% ± 3.7% with predominant loss of fat mass (–22.0% ± 9.5%). The HbA1c level at baseline was 7.0% ± 1.2% and mean HbA1c change was –0.89% ± 1.12% (P < 0.001). Upon completing the 12-week intervention, 75% (18/24) of the participants achieved diabetes remission based on HbA1c level. When both OGTT thresholds (fasting glucose and 2-hour post-load glucose) were met as criteria for diabetes remission, 54% (13/24) of the participants were in remission. Using a time in range of ≥ 90% as the diagnostic criterion for diabetes remission, 70.8% (17/24) of the participants were in remission.
Conclusions: The present study demonstrated the clinical efficacy of weight loss via a dietary intervention in achieving diabetes remission. The findings also suggest that the degree of diabetes remission varies considerably depending on the definition.

PO4.081

Perspectives and experiences of adult patients with obesity on dietetic primary health care: a qualitative study in the Netherlands

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Background: Obesity is a growing global health challenge linked to chronic diseases and reduced quality of life. Sustainable weight loss requires long-term dietary and behavioural changes. Dietetic treatment outcomes vary per patient, leading to differing success rates and effectiveness. Although understanding patient experiences is crucial for designing effective, patient-centered strategies, little is known about patients' lived experiences. This study aimed to obtain a better understanding of the perspectives and experiences of patients with obesity on dietetic care in primary health care in the Netherlands.
Methods: This phenomenological study included 26 patients with obesity who were currently consulting or had previously consulted a dietitian. To ensure a diverse and representative sample, we collected demographic characteristics through questionnaires. Semi-structured interviews were conducted, using a predefined topic guide, with room for flexibility to explore emerging topics. We analysed the interview data using reflexive thematic analysis as described by Braun and Clarke.
Results: Four interconnected themes were constructed, each consisting of different subthemes: 1) Patient-dietitian relationship, including personal connection, understanding dietitians' ways of working, aligning treatment to individual needs, and flexibility of treatment approach; 2) Dietitian's characteristics, discussing attitude, role, trustworthiness and background; 3) Comprehensive treatment focus, emphasizing a holistic approach, behavioural change support and attention for psychology; and 4) Tailored advice, reviewing strategies for dietary advice, suitable form of advice and consistency of advice.
Conclusion: This study highlights the importance of a strong patient-dietitian relationship, holistic care including psychological support, and shared decision-making to make dietetic care successful from the perspective of patients with obesity. Findings emphasise the importance of tailored, patient-centered approaches and indicate the importance of improving communication about treatment and the alignment with individual patient needs.

PO4.082

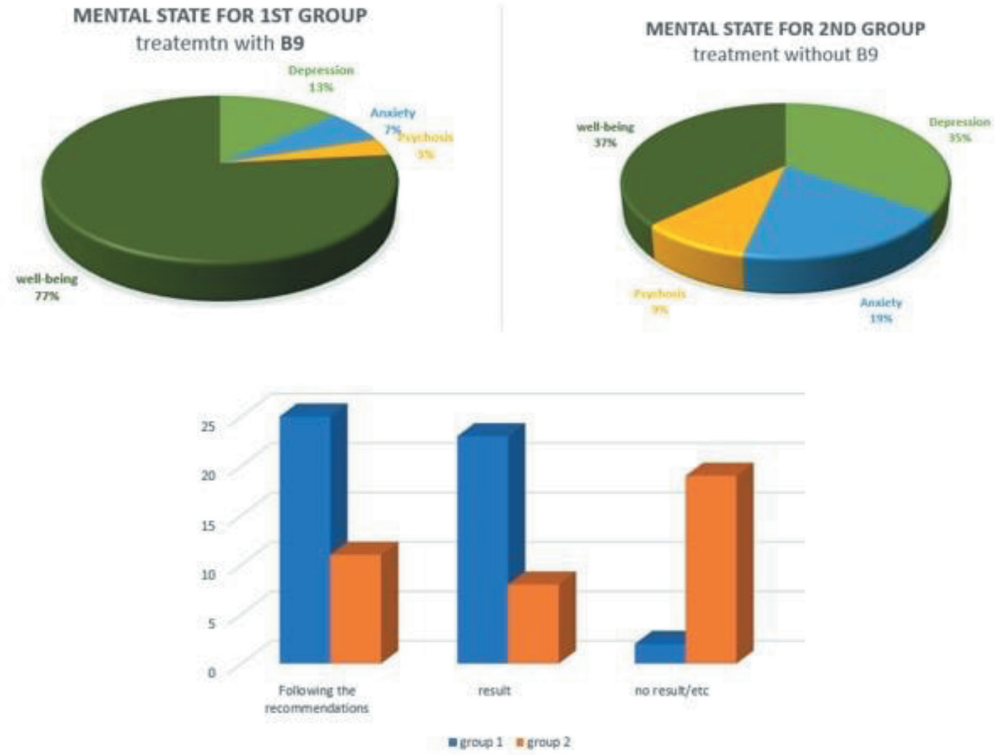
The effect of a therapeutic dose of folic acid after bariatric surgery and its impact on mental well-being

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Objective: This study will examine the role of folic acid in bariatric patients and its impact on psychological health. A mixed methods approach will be used to gain a deeper understanding of how this B9 regulation affects individuals' attitudes, mental states, and behaviors. The results of this study aim to raise awareness of the value of folic acid in long-term weight-related challenges and provide valuable information on mental health.
Methods: The study will utilize a mixed-methods approach, combining quantitative surveys with qualitative interviews to assess quality. The study was conducted in the bariatric surgery department of Aversi Clinic in 2021-2024. Sixty Patient were divided into two groups. In the first group, folate levels were determined before surgery and during shortages treatment was started at 800 mcg per day, In the second group,B9 was not prescribed before surgery, so they did not take in a therapeutic dose for the first month.
Result: As a result of observation and data analysis, it was revealed that, In the first group of patients, 76%(23), who received therapeutic doses of B9, the postoperative period was calm, anxiety was not detected at a high rate; also, depression was detected in only four patients, and adherence to the post-bariatric diet and recommendations was high. In the group that did not receive folic acid, 63%(19), relatively high anxiety and depression were observed. As for the result, it was more or less satisfactory.
Conclusion: This study aspires to identify sustainable strategies for maintaining how B9 can play an important role in enhancing both physical health and mental well-being, ultimately contributing to successful and enduring weight loss during bariatric surgery. therefore Based on the data obtained, it can be assumed that the research design, which aimed to determine B9's role, was evident even in a small study; Which also increased the achievement of treatment results and patient compliance.

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the graphs describe the results of the two groups as well as their response to treatment

Fig. 1. Graphic description.

PO4.083

Development of a new interventional therapy for obesity targeting the gastric branches of the vagus nerve

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Introduction: The gastric truncs of the vagus nerve have been the target for the treatment obesity. Surgical transection of the posterior and anterior gastric trunks, modification by electrical stimulation (VBLOC), and cryoablation of the posterior trunk have been successfully used since the 1970ies to reduce the hunger feeling and weight as recently summarized in a meta-analysis (1). However, these therapies evolved into modern bariatric surgery, showed limited effects (VBLOC), or were difficult to scale (CT guided interventional cryoablation). We thought to develop an ambulant, cost-efficient, interventional therapy addressing the gastric trunks of the vagal nerve.

Methods: A cryocatheter (Blizzard; Sedivention GmbH Germany) was developed with two medical polymer-based balloons which are inflatable. The smaller proximal balloon has a diameter of 3.5 cm and is used for safe positioning in the stomach distal to the esophagus. The second distal balloon is the cryo-balloon expanding to a diameter of 6 cm. The cryo-balloon adheres after inflation to the gastric wall at the fundus. The cryo-balloon is inflated at low pressures by the expansion of a fluid gas (N2O), which while expanding creates a temperature of < -80°C at the balloon surface. The fluid gas is in a tank controlled by a console. There is an additional lumen to vent the stomach. The drawing illustrates the components of the balloon.

Results: In an in vitro model 2 minutes of cooling with the cryo-catheter let to a temperature of -20°C on the outer surface of the stomach. In a porcine animal model cryo-neurolysis of the vagal fibres were demonstrated after three cycles of cooling (5 min) and thawing (8 min), although the porcine stomach contained large amounts of hay isolating parts of the stomach against the cooling balloon. Animals immediately after and at one and two weeks the intervention showed no reddining or ulceration of the mucosa, whereas nerves demonstrated vacuolization, fibrosis, and inflammation indicative of cryoneurolysis

Conclusion: Cryo-ablation of the gastric fibres of the vagus nerve is feasible and safe with a newly developed cryo-catheter in a porcine animal model. This approach may lead to a minimally invasive, interventional approach to reduce the hunger feeling and support weight loss in patients suffering from obesity.

(1) Fadel G et al.: Vagal Nerve Therapy in the Management of Obesity: A Systematic Review and Meta-Analysis Eur Surg Res. 2023;64(4):365-375

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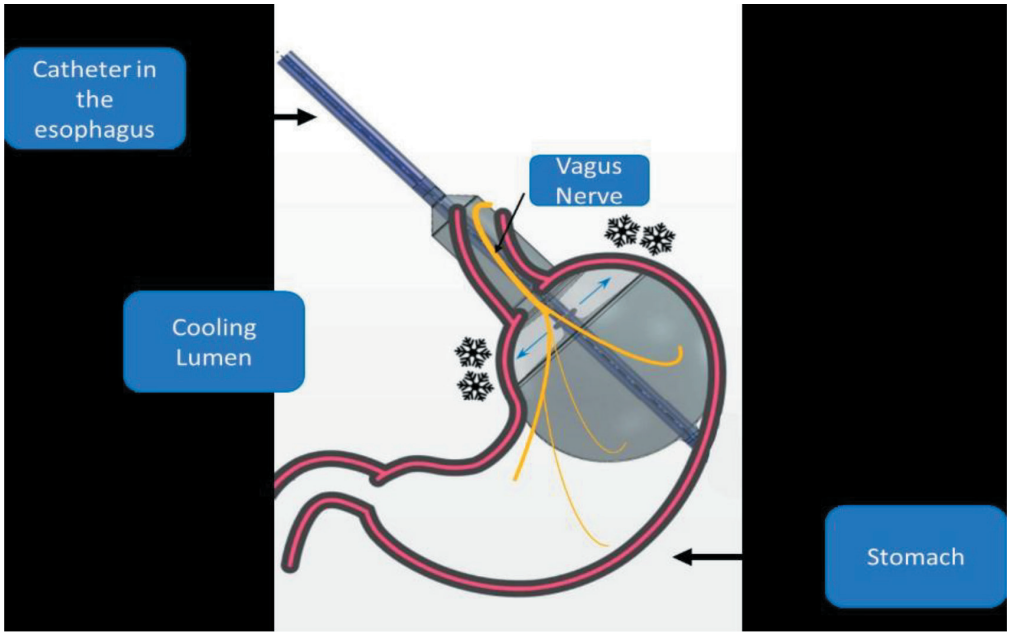


Fig. 1. Sketch of a new cryo-catheter for the ablation of the gastric vagal trunks.

PO4.084

Identification of cardiometabolic risk using the TG/HDLc ratio and the TyG index in women with obesity associated with fatty liver

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Introduction: Non-alcoholic fatty liver disease (NAFLD) has been strongly associated with obesity. In light of this, the assessment of cardiometabolic risk, particularly that of insulin resistance, has become a current priority. In addition to the Homa test, the TG/HDLc ratio and the TyG index are considered to be reliable tools for the assessment of insulin resistance. The aim of this study is to assess the usefulness of the TG/HDLc ratio and the TyG index in identifying insulin resistance in women with obesity and fatty liver.
Methods: This cross-sectional study examined women with obesity (BMI ≥ 30 kg/m2). Abdominal ultrasound was employed to confirm the presence of hepatitis steatosis and a lipid panel was subsequently performed. The TyG index and triglyceride-to-HDL cholesterol ratio were calculated using standard formulae. The patients were classified according to the three levels of cardiometabolic risk that correspond to this ratio. Level 1 (0.5-1.9): no risk; level 2 (2-3): possible risk; level 3 (> 3): confirmed risk. The threshold of 4.49 for TyG was considered pathological.
Results: A total of 42 women with obesity participated in the present study. The mean age of the participants was 50 years (± 10 years). Their BMI was found to be 40.8 ± 5.0 Kg/m2. Within the present series, half of the participants were classified as having stage 3 obesity (BMI=45±4.3 Kg/m2). Furthermore, two-thirds of the participants exhibited cardiometabolic risk, characterised by an average triglyceride-to-high-density lipoprotein cholesterol ratio (3.1±1.2). Furthermore, just over one-third of the participants (n=15) had a confirmed risk of cardiovascular disease (TG/HDLc=4.09±1.53). In this group, TG/HDLc was strongly linked to the predicted value of 3 (p=0.003). The evolution of this ratio was found to be independent of the stage of obesity (p ≥ 0.05). Furthermore, 81% of the subjects exhibited a TyG index indicative of a heightened risk of insulin resistance (TyG index >4.49).
Conclusion: The TG/HDLc ratio and the TyG index have been demonstrated to be reliable biomarkers of insulin resistance and cardiovascular risk. The present study hypothesises that women with obesity associated with non-alcoholic fatty liver disease (NAFLD) are at significant cardiometabolic risk, a hypothesis strongly supported by evidence derived from the TG/HDLc ratio and the TyG index.

PO4.085

Effects of Weight-Loss Diets on Telomere Length: A Comparison of Moderately High-Protein and Low-Fat Approaches in Individuals with Overweight or Obesity

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Introduction: Telomere length (TL), a marker of cellular aging, is associated with increased risk of age-related diseases when shortened. Lifestyle changes could play a key role in preventing such conditions. This study explored the impact of two weight loss dietary approaches, moderately high-protein (MHP) diet and low-fat (LF) diet.
Methods: The study included 164 adults (18–65 years) with overweight or obesity from the OBEKIT trial, assigned to MHP group (n = 83) or LF group (n = 81) for 4 months. TL was measured pre- and post-intervention using monochrome multiplex quantitative polymerase chain reaction (MMqPCR).
Results: Both interventions showed significant improvements in body measurements and biochemical markers (p < 0.001). Adjusted analyses showed greater TL increase with MHP diet (+0.16±0.13) vs. LF diet (-0.05±0.13, p = 0.016). A sex-based interaction was noted, women on MHP diet experienced significant TL increase (+0.23±0.16) vs. LF diet (-0.13±0.15,

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p = 0.001), no significant differences in men. TL increase in women on MHP group was associated with higher protein intake (p = 0.006).
Conclusion: Findings suggest that MHP diet may help protect TL during weight loss, particularly in women, highlighting the importance of macronutrient composition in dietary strategies aimed at preserving TL.

PO4.086

Weight loss and healthcare resource utilization in the 12-month digital Healthy Weight Coaching

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Introduction: Digital obesity management programs increase the availability of care and reduce costs related to the treatment. In this real-life, single-arm, prospective cohort study, we investigated the weight loss outcomes and changes in healthcare resource utilization in patients enrolled in the 12-month Healthy Weight Coaching (HWC).
Methods: The HWC is an ongoing, referral-based, fully digital obesity management program integrated into standard clinical care in Finland. The structured program consists of 52 training sessions covering a wide range of weight management-related topics, delivered in a compassionate, non-stigmatising environment, with each patient supported by a personal coach. For this study, we included data from consenting patients enrolled between Oct 2016 and Sep 2020 who did not report using any other weight loss methods. Weight and height were self-reported at baseline. Thereafter, weekly weight-reporting was encouraged. BMI was calculated based on interpolated daily weights for each patient. Per protocol (PP) analyses included %-weight loss at 12-months, and the percentage of individuals achieving ≥5% and ≥10% weight loss. A linear mixed-effects model applied to the Full Analysis Set (FAS) estimated weight loss outcomes, accounting for repeated measures and missing-at-random data. Hierarchical cluster analysis (HCA) grouped weight trajectories. Healthcare resource utilization, categorized as 0, 1–3, 4–6, 7–9, or ≥10 visits per year, was self-reported at baseline and 12 months.
Results: Data were available for 1975 patients (82.2% women, median age 52 years, median BMI 39.2 kg/m^2, median weight 111 kg). Overall, 1275 (64.6%) patients completed the program. Mean weight loss in the PP analysis was 4.6% (4.0%–5.2%), with 41.2% achieving a minimum of 5% weight loss and 16.1% achieving ≥10% weight loss. In the FAS, the mean weight loss was 3.0% (2.7%–3.2%). HCA revealed five distinct groups: superresponders with a mean weight loss of 19.0%, responders with 8.8% weight loss, moderate responders with 4.7% weight loss, nonresponders with 0.4% weight loss, and gainers with a mean weight gain of 3.0%. Healthcare resource utilization was reported by 321 patients (16.3%) at both baseline and 12 months. At baseline, 0.9%, 32.1%, 34.6%, 16.5%, and 15.9% reported 0, 1–3, 4–6, 7–9, and ≥10 visits, respectively. At 12 months, these proportions shifted significantly (p<0.001) to 13.4%, 43.8%, 19.9%, 12.2%, and 10.7%, demonstrating a marked reduction in healthcare resource utilization across all weight loss trajectories.
Conclusion: Participation in the real-life digital HWC program led to significant weight loss and reduced healthcare resource utilization, demonstrating its effectiveness in a practical setting. Comprehensive digital programs offer a cost-effective solution for obesity management, enhancing access to care while reducing reliance on face-to-face services and associated costs.

PO4.087

Beyond the scale: evaluating low muscle mass in hospital patients with overweight or obesity

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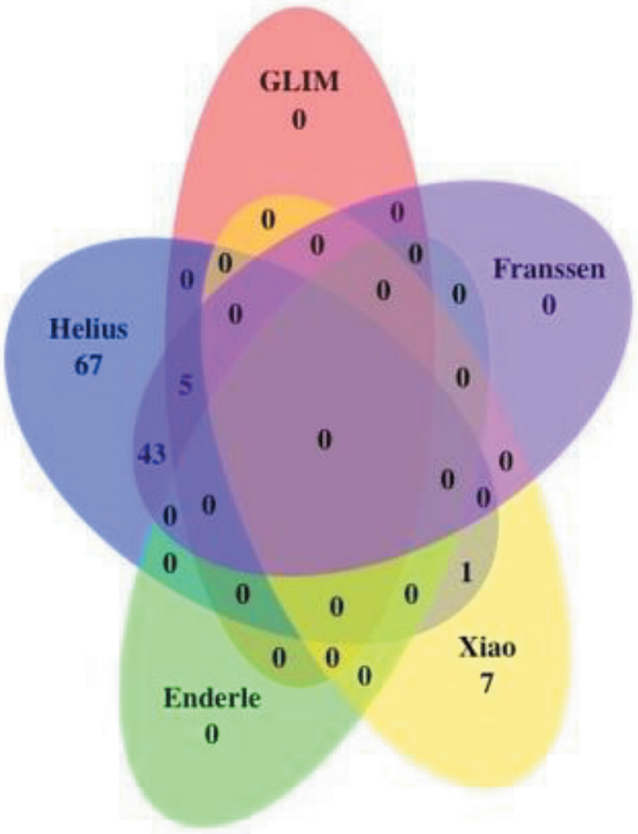
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Introduction: Disease-related malnutrition and obesity can co-exist within one person and the combination has been shown to worsen clinical outcomes. Diagnosing malnutrition in patients with obesity is challenging: current definitions of malnutrition do not adequately account for the characteristics of patients with obesity. According to the Global Leadership Initiative on Malnutrition (GLIM), low muscle mass is a critical diagnostic criterion for malnutrition. Bioelectrical Impedance (BIA) is a quick and easy-to-use method to assess muscle mass, but it is unclear how to interpret the outcomes in hospital patients with overweight or obesity.
Methods: Preliminary data from a cross-sectional study aimed at diagnosing malnutrition in hospital patients with overweight/obesity (BMI ≥ 25 kg/m^2) was used. Bioelectrical Impedance (BIA) was used to assess muscle mass. From the literature 5 different methods were applied to identify individuals with low muscle mass: 1. Kyle equation and GLIM criteria, low fat free mass index (FFMI) <17 kg/m^2 (M), <15 kg/m^2 (F) 2. Kyle equation and HELIUS cut-off points, low FFMI <21 kg/^{2} (M), <18.6 kg/m^2 (F) 3. Enderle classification of low muscle mass 2 SD below reference values for sex, age and BMI 4. Xiao fat mass/fat free mass ratio, cut off <5th% of reference values for sex, age and BMI 5. BIA-derived percentiles for FFMI index from the UK Biobank, <10th% of normative values.
A Venn diagram was created to show the overlap between the 5 methods. Kappa correlation coefficients were calculated to study correlations.
Results: Out of 228 included patients (62±15 years,42% female, BMI:31.6± 5,6 kg/m^2), BIA data was available for n=201. Low muscle mass according to at least 1 criterion was observed in 123 (61.2%) patients: GLIM n=5 (2.5%), Helius n=116 (57.7%), Enderle n=0 (0%), Xiao n=8 (4%), Franssen n=48 (23.9%). The Venn diagram (figure) depicts the number of patients meeting the criteria for low muscle mass according to the five methods, and the overlap between the methods. The correlations between the methods were poor to fair (highest Cohen's kappa 0.374).
Conclusion: Different approaches to identify low muscle mass by BIA in hospital patients with overweight or obesity result in prevalence rates from 0 – 58%. There is an urgent need to come to standardisation and international consensus on how to measure and define low muscle mass in patients with overweight and obesity.

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Venn diagram depicting the number of patients meeting at least 1 of the 5 criteria for low muscle mass (n=123), and the overlap between the methods

Fig. 1. Venn Diagram.

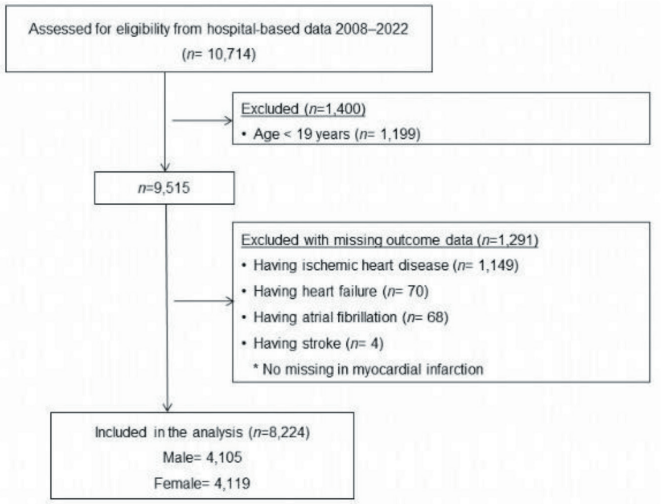
PO4.089

Higher HbA1c Variability and Reduced Muscle Mass Increased Cardiovascular Risk: A Cohort Study of 8,224 People with Type 2 Diabetes

Kim, S.[1]*; Hwang, J.*[2]*; Rhee, S. Y.*[3]

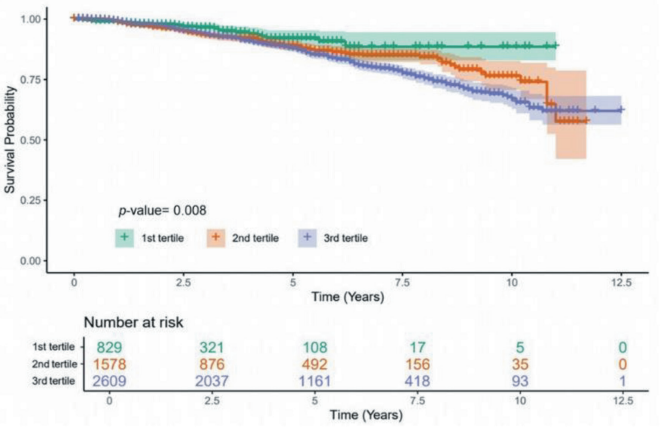
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Background: Cardiovascular disease (CVD) is a leading cause of mortality in individuals with type 2 dia-betes mellitus (T2DM), highlighting the urgent need for effective diabetes management to prevent compli-cations. Glycated hemoglobin (HbA1c) variability serves as a crucial marker for evaluating glycemic con-trol, while muscle and adipose tissue significantly impact glucose metabolism. This study investigates the associations between HbA1c variability, body composition, and cardiovascular outcomes, including mortal-ity, in adults with T2DM.
Methods: This retrospective cohort study reviewed electronic health records from a university hospital be-tween 2011 and 2020. Of the 10,714 individuals assessed, 8,224 patients aged ≥20 years with T2DM and no prior history of CVD were included in the final analysis. HbA1c variability score (HVS) was calculated as the percentage of successive measurements differing by ≥ 0.5% (5.5 mmol/mol) relative to the total com-parisons. Body composition was evaluated using bioelectrical impedance analysis, with the primary out-come being incident CVD.
Results: The mean follow-up duration was four person-years, with a mean age of 58.3 years (50.1% wom-en). Patients with high HVS exhibited elevated systolic blood pressure, HbA1c levels, total fat percentage, and decreased skeletal muscle mass (SMM). High HVS correlated with increased CVD risk (adjusted HR [aHR] 1.69, 95% CI 1.15–2.48, p=0.010). Conversely, appendicular skeletal muscle mass (ASM) was pro-tective against CVD (aHR 0.75, 95% CI 0.64–0.89), while total fat percentage (TFP) heightened CVD risk (aHR 1.10, 95% CI 1.03–1.20).
Conclusion: HbA1c variability and body composition significantly predict cardiovascular outcomes in persons with T2DM. High HVS and increased TFP elevate CVD risk, whereas higher ASM provides protec-tive effects. Comprehensive diabetes management should address glycemic variability and body composi-tion to reduce cardiovascular mortality.



Schematic of the analysis pipeline

Fig 1.



The Kaplan–Meier curve for HVS and overall survival (P = 0.008)

Fig 2.

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Tab. 1. HRs and 95% CIs for risk of CVD according to the tertiles of HVS score groups.

	1st tertile	2nd tertile	3rd tertile	P-value	P-trend
FPG variability groups					
Case/None-cases	28 / 584	23 / 580	36 / 558		
Model 1	1 (Reference)	0.91 (0.52, 1.58)	1.39 (0.82, 2.34)	0.257	0.565
Model 2	1 (Reference)	0.99 (0.73, 1.32)	1.41 (0.78, 1.89)	0.105	0.130
Model 3	1 (Reference)	0.97 (0.71, 1.35)	1.40 (0.90, 1.88)	0.215	0.086
Model 4	1 (Reference)	0.95 (0.70, 1.26)	1.43 (0.93, 1.88)	0.489	0.162
PP2hrs (PPG) variability groups					
Case/None-cases	78 / 1,247	82 / 1,284	80 / 1,241		
Model 1	1 (Reference)	0.97 (0.70, 1.33)	1.03 (0.75, 1.42)	0.097	0.071
Model 2	1 (Reference)	1.10 (0.62, 1.80)	1.60 (1.01, 2.52)	0.110	0.108
Model 3	1 (Reference)	1.10 (0.79, 1.82)	1.61 (1.02, 2.55)	0.198	0.091
Model 4	1 (Reference)	1.14 (0.81, 1.61)	1.60 (1.01, 2.52)	0.105	0.110
HVS					
Case/None-cases	68 / 2,621	143 / 2,653	389 / 2,350		
Model 1	1 (Reference)	1.40 (0.94, 2.09)	1.69 (1.15, 2.47)	0.009	0.005
Model 2	1 (Reference)	1.43 (0.96, 2.14)	1.69 (1.15, 2.48)	0.013	0.010
Model 3	1 (Reference)	1.42 (0.95, 2.13)	1.68 (1.15, 2.47)	0.014	<0.001
Model 4	1 (Reference)	1.44 (0.96, 2.16)	1.83 (1.23, 2.30)	<0.001	<0.001

Cardiovascular diseases (CVD) include ischemic heart disease, heart failure, atrial fibrillation, myocardial infarction, and stroke. HbA1c variability score (HVS) is calculated by the number of successive measurements that differed by 0.5% (5.5 mmol/mol) or more divided by the number of comparisons and then multiplied by 100. The P-trend was assessed by treating the categorical variable as continuous. HR, hazard ratio; CI, confidence interval; HbA1c, glycated hemoglobin. FPG; fasting plasma glucose, PP2hrs; postprandial 2-hour glucose. Model 1 non-adjusted; Model 2 age, sex, HbA1c, HTN, dyslipidemia, glucose-lowering medication; Model 3 model 2+ Δ aASM; Model 4 model 2+ Δ Total fat %

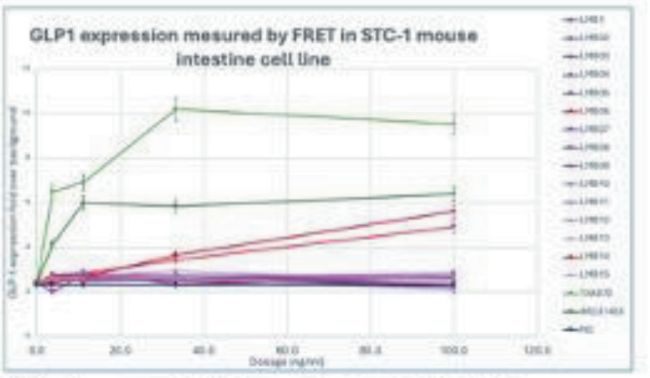
PO4.090

Novel peptides as food ingredient for weight management

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The Problem: Obesity has become a global epidemic, increasing the risk of numerous chronic diseases. Current weight management approaches often involve pharmaceutical interventions or invasive procedures, which can have significant side effects and limited long-term effectiveness.
Purpose: This work aims to develop novel peptides designed to induce satiety and aid in weight management through natural appetite regulation mechanisms, offering a non-pharmaceutical alternative for both initial weight loss and long-term weight maintenance.
Methodology: Advanced machine learning techniques were employed to design peptides targeting specific intestinal receptors involved in appetite regulation and metabolic health, including GPR40, GPR119, GPR120. The peptides were engineered to mimic the natural effects of rich food on these receptors.
Results: A series of novel peptides (Lembas-P1 through Lembas-P115) were successfully developed. These peptides are designed to interact with their target receptors in the intestine, triggering physiological responses similar to those induced by a large, nutritious meal. The peptides were tested in vitro at a HTS platform, and 2 of them were found to increase the level of GLP1 in STC-1 murine cells.
Conclusion: Lembas peptides have the potential to assist weight management by naturally increasing satiety hormones such as GLP1, offering a food-based, non-pharmaceutical approach to addressing the global obesity epidemic. The multi-target approach of these peptides mimics the body's natural satiety mechanisms, potentially providing a unique and sustainable solution for weight management and metabolic health.



STC-1 cells were grown for 24 hours prior to treatment in 384 well plates
The treatment was given in duplicates. The treatment was given for 2 hours followed by GLP-1 (FRET kit) mesurment in the cell media for 12 hours and analzed by HTRF
The treatment was 15 different peptides in dosages between 4 to 100ng/ml or 2 positive control GPR agonists TAK870 and AR231453 (green)

Fig. 1. Results.

PO4.091

What is the role of psychodiagnostic before and after bariatric surgery

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Introduction: Psychodiagnostics is a set of many psychological examinations and methods, which include assessing the mental state, making a diagnosis, and determining the ways of intervention using clinical interviews, testing, and observation.

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Psychodiagnostics is widely used in medical institutions to determine the mental health and condition of patients. Referral occurs when a specific problem and difficulty arise in a person's life and interfere with normal functioning.

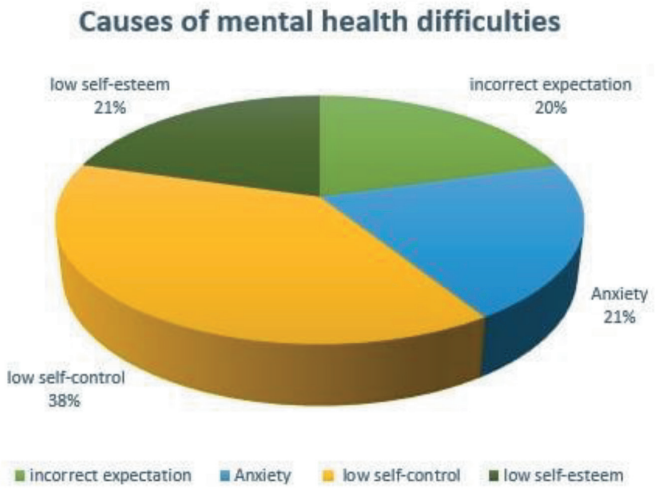
Since mental health is an integral part of a person's normal functioning, the study aims to determine the practicality of psycho diagnostic examination and psychological consultation before and after bariatric surgery.

Methods: Patients of the Aversi Clinic who underwent bariatric surgery in 2023-2024 participated in the study. In addition, data were fully obtained from 28 patients, of whom 21 are female and seven are male. A mixed-type study was used. The work is mainly based on qualitative research—an in-depth interview method, with semi-structured questions and auxiliary diagnostic tools, was used to study the variables.

Result: As the study revealed, for 67.8% (19) of the patients, psycho diagnostic turned out to be a valuable tool to understand better their psychological characteristics and mental health, of which 89% (17) are female, and 11% (2) are male. For 32% (9) of the patients, psycho diagnosis was not new because they knew their mental state (they already had a psychiatrist or psychologist).

The changes in psychological state checked 3 months after the operation showed a positive effect in 70% of the cases. In contrast, 30% showed a negative effect caused by the deterioration of expectations, self-esteem, or mental state.

Conclusion: As the study shows, psycho diagnostic testing provides important information to the patient before bariatric surgery to better prepare him and allow him to understand the changes and accept them correctly after the operation. Also an important finding of the study is that despite the great desire and motivation to undergo bariatric surgery, in most cases, people have to deal with psychological difficulties at some stage, as adapting to dietary changes takes longer than patients expect.



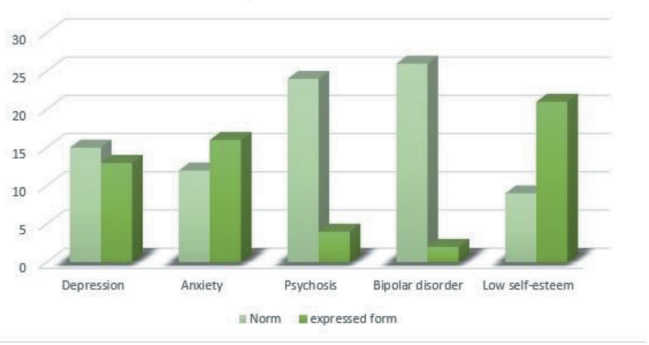
Causes of mental difficulties after bariatric surgery

Fig. 1. Data.

Data, 3 months after bariatric surgery	satisfactory	Unsatisfactory
General psychological state	70%	30%
Improvement of mental state	75%	25%
Quality of life	80%	20%
Self-esteem	75%	25%
Emotional state	70%	30%

data after 3 month of bariatric surgery

Fig. 2. Data.



post-operative difficulties

Fig. 3. Data.

PO4.092

A comparison of the efficacy, comorbidities outcome, and safety of endoscopic bariatric procedures: intragastric balloon placement versus endoscopic sleeve gastroplasty (Apollo method). One-year follow-up

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Introduction: Intragastric balloon (IGB) placement and endoscopic sleeve gastroplasty (ESG) using the Apollo method are two effective techniques for weight loss in people with obesity. The aim of this study is to evaluate the efficacy, comorbidities impact, and safety of both endoscopic bariatric procedures.

Methods: We performed a single center descriptive-retrospective analysis in 103 patients undergoing endoscopic bariatric therapy (EBT) (39 IGB (6 months) placement and 64 ESG), between 2016-2023, at 1-year follow-up. We assessed clinical, anthropometric and biochemical parameters as well as safety. We performed a multiple linear regression study to determine the predictive variables of total weight loss (% TWL). All patients followed the guidelines of our interdisciplinary obesity unit.

Results: We found no significant differences between both groups in terms of age, gender, comorbidities (HBP, T2DM, dyslipidemia, severe OSA and presence and degree of liver steatosis). There were significant differences between the IGB and ESG groups respectively in BMI: 35.7 (SD 4.14) vs. 38.4 (SD 4.8) p=0.005, class of obesity: 41% type I vs. 54.7% type II p=0.010, and completed endocrinological/nutritional follow-up

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schedule: 66% vs. 82% p=0.000. There was a significant improvement in lipid profile in the IGB group and glycemic profile in the ESG group at one year. All patients showed pre-diabetes remission at 1 year. Predictors of better %TWL at 1 year were sex (male > female), baseline BMI (the higher the BMI the better the response), and type of treatment (ESG > IGB). We found significant differences in %TWL, %EWL and BMI at 1 year in favour of the ESG group. 8 IGB patients required early removal (mean 52 days), while 1 ESG patient had hematemesis and 1 ESG patient had abdominal abscess.

Conclusions: Both IGB and ESG are safe and effective procedures. The ESG group showed a more significant weight loss at one year. Both EBT techniques improve glycemic and lipid profiles and can therefore be considered as a therapeutic alternative in patients with obesity who also have other metabolic comorbidities.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.093

Realist inspired process evaluation of a pilot study investigating time-restricted eating in the treatment of type 2 diabetes – the RESET2 pilot study

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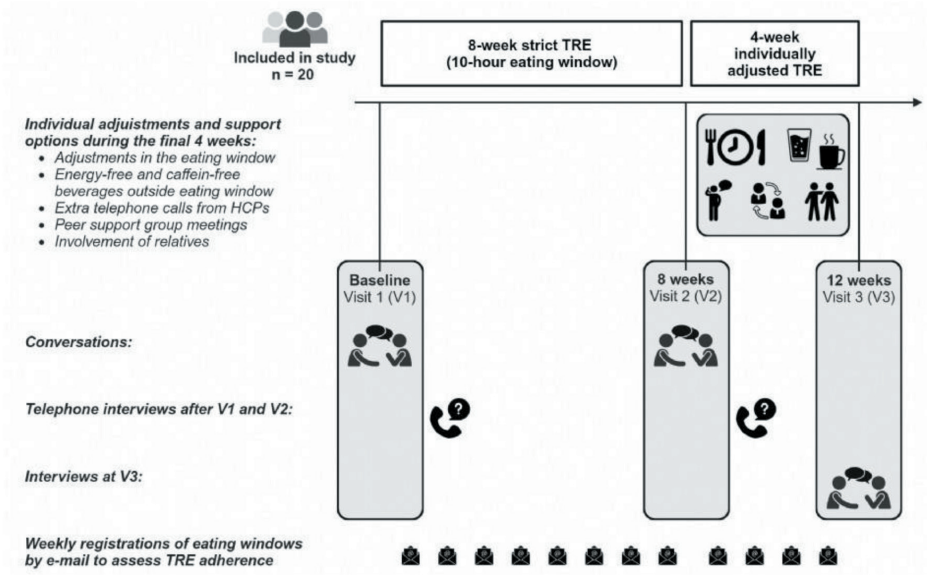
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Introduction: In the process of co-designing a 1-year randomised controlled trial (RCT) to investigate effects of a time-restricted eating (TRE) intervention in the treatment of type 2 diabetes, a 12-week single-arm pilot study was conducted to test the feasibility and inform the design of the intervention. Implementation and acceptance of core intervention components and activities, as well as participants' experiences of implementing TRE in daily life were evaluated. Additionally, (Intervention activity)-Context-Mechanism-Outcome (I)CMO configurations related to TRE adherence were created to gain an understanding of what works, for whom, and under what circumstances.

Methods: Nineteen individuals with type 2 diabetes and overweight/obesity completed 8-weeks of TRE with a 10-hour eating window, followed by 4-weeks of TRE with individual adjustments and support options. Participants took part in two 1-hour conversations with HCPs at baseline and after 8 weeks (Figure 1). Delivery and implementation of the intervention (visits, measurements, conversations, and phone calls) and the two-phase design were assessed. All conversations were audio-recorded to investigate the extent to which they were conducted as intended. All participants were interviewed at three timepoints during the intervention (at baseline, after 8 weeks and after 12 weeks) to investigate how participants experienced and felt supported by the intervention approach and activities, and how they implemented TRE in daily life. All interviews were audio-recorded. A deductive qualitative content analysis approach was applied. To create (I)CMOs, qualitative and quantitative data from multiple sources were used to capture a comprehensive understanding of the core intervention components and activities (resources and context), participants' context, participants' responses, and outcomes.

Results: Intervention activities were delivered with high degree of consistency, including scheduled visits, measurements, conversations, and phone calls, and the two-phase design of strict and individualized TRE was effectively implemented. Participants found the TRE intervention highly acceptable, appreciating the relevant information, well-organized trial visits, supportive HCPs, and encouraging conversations that helped them implement and sustain TRE. Several contextual factors such as being supported by relatives, level of social life, having mental and physical challenges, working schedules and family structures influenced participants' experiences of implementation of TRE. Intervention activities were found to influence TRE adherence and maintenance positively. Key findings were formulated as (I)CMO configurations relating context and intervention activities to outcomes through proposed mechanisms.

Conclusion: Insights from participants' diverse contexts and intervention activities provided a nuanced understanding of what works, for whom, and under what circumstances in terms of TRE adherence. These findings will guide the design of the RCT to make the intervention more tailored and relevant to the target population.



The RESET2 pilot study design. HCPs: health care professionals, TRE: time-restricted eating, V: visit.

Fig. 1.

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PO4.094

Testing for genetic causes of obesity in adults: experience of an NHS adult weight management service

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Introduction: It is estimated that around 5% of patients with severe (BMI >40kg/m2) and early onset obesity will have a monogenic cause, commonly within the leptin-melanocortin pathway. Testing for genetic causes of obesity on the NHS is reserved for children and adults with severe obesity (BMI sds >3; BMI ≥40kg/m2) that started before the age of 5 years. Many patients are undiagnosed into adulthood, when a definite history of early weight gain can be challenging to confirm. There is limited knowledge regarding the clinical characteristics of adults with genetic causes of obesity.

Methods: We tested adults attending a secondary care weight management service for a genetic cause of obesity using a panel based on whole exome sequencing of 80 genes known to be associated with obesity. The test was offered to adults with a BMI ≥40 kg/m² with a history of obesity in childhood or with hyperphagia. Medical records were reviewed for demographic information and associated co-morbidities.

Results: Of 58 subjects, 67.2% were female, mean age 35.5 (SD10.8), mean weight 145 kg (SD 35.7 kg) and mean BMI 51.3kg/m2 (SD 11.5 kg/m²). Relevant co-morbidities included, type 2 diabetes (T2DM,10.8%), hypertension (19%), obstructive sleep apnoea (OSA, 25.8%), anxiety/depression (37.9%) and autistic spectrum disorder/learning difficulties (19%).
34 (58.6%) subjects were found to have at least one variation or potentially relevant variation; 21 (36.2%) had one variant reported and 13 (22.4%) had 2-4 variants reported. All variants were heterozygous, 12 (22.2%) reported as pathogenic or likely pathogenic, 33 (61.1%) variants of unknown significance (VUOS) and 9 (16.7%) variants were a known polygenic risk factor (PCSK1). The chromosome deletion syndrome 16p11.2 was identified in 2 subjects. In total 40 variations were identified, the majority (85%) being rare (minor allele frequency < 0.05% or not reported in ClinVar or gnomAD databases). Between group comparison showed slight differences in weight and BMI between the subjects without a variation identified and those with variations (weight 143.9 kg vs 146.3 kg and BMI 49.5 kg/m² vs 52.5 kg/m² respectively). Within the cohort with a genetic variation, more were female (70.6% vs 62.5%), and this group also had higher rates of T2DM and OSA (14.7% vs 4.2% and 35.3% vs 12.5% respectively).

Conclusions: We identified a significant proportion of adults living with obesity in an NHS weight management service with variations within genes associated with obesity. The majority of these were VUOS and further research is needed to understand the influence of these variants on the development of obesity. It is notable the relatively small proportion of patients living with T2DM and hypertension given the degree of adiposity, and analysis of larger cohorts may help identify clinical characteristics that are associated with a genetic cause of obesity and help refine the genetic testing criteria for adults. None of the patients in this cohort would qualify for medications such as setmelanotide, and more knowledge is needed to determine how these patients would respond to bariatric surgery or GLP-1 agonists.

PO4.095

Predicting weight loss using self-reported, digitally collected, real-world data after initiation of semaglutide treatment

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Introduction: We hypothesized that an exposure-response weight predictor algorithm developed from randomized controlled trial data can predict long-term individual body weight changes in response to subcutaneous semaglutide treatment for weight management using self-reported, real-world data, collected through an app-based patient support solution.

Methods: Data from one 52-week, phase 2 trial and two 68-week phase 3 trials with semaglutide in people with overweight or obesity have previously been used to develop an exposure-response model (1). In the current study, the model was applied to a real-world data set from patients prescribed semaglutide (Wegovy®) by their treating healthcare professional and enrolled in a digital patient sup-port program (WegovyCare®) from January 2023 to May 2024. In addition to baseline data (sex and body weight), the app allowed users to track semaglutide doses and body weight, serving as model inputs. The predictive ability of the model was evaluated in 2 scenarios: 1) a half-year treatment scenario (26 +/- 4 weeks), where model forecasts were updated at weeks 4, 8 and 16; and 2) a full-year treatment scenario (52 +/- 4 weeks), where model forecasts were updated at weeks 8, 16 and 28. Model bias was estimated as the mean predicted body weight minus the mean observed (i.e., self-reported) body weight. Model precision for predicting categorical weight loss of ≥10%, ≥15% or ≥20% was evaluated by receiver operating characteristic (ROC) curves as area under the curve (AUC).

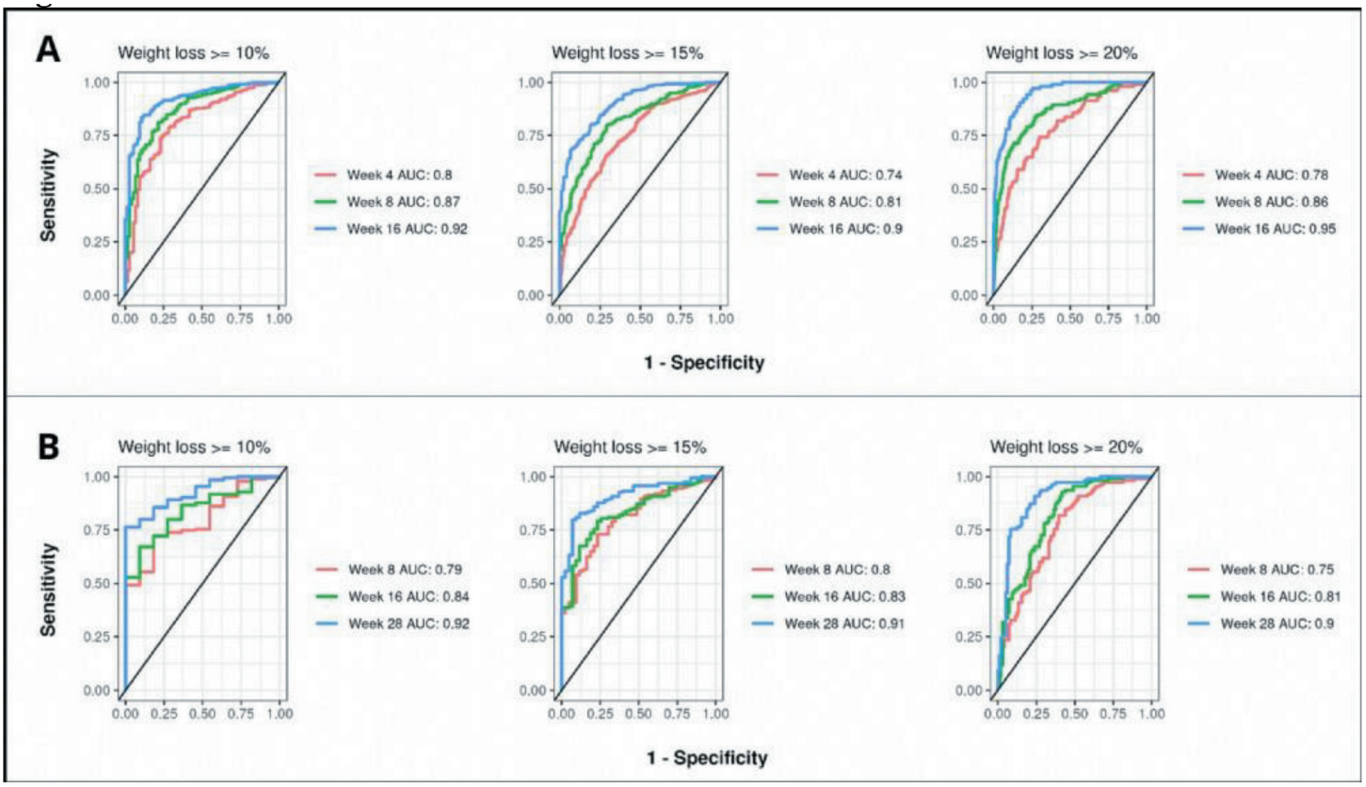
Results: A total of 1,797 WegovyCare® app users from Denmark (87.6%), Switzerland (6.9%), and Germany (5.5%) were included in the study at baseline. They were mainly women (81%) with a mean (SD) age of 48.0 (11.8) years and mean (SD) self-reported body weight of 105 (19.5) kg. The dataset had a gradual decline in the number of individuals represented over time as users enrolled and discontinued app use. In the half-year scenario (Fig. 1A), the mean body weight reported by persistent WegovyCare® users was 90.1 kg, corresponding to a 15% weight loss. Model bias was low (ranging from 0.3 kg to 1.1 kg) and model precision for predicting categorical weight loss was high (AUC from 0.74 to 0.95) and improved with time after successive model updates. In the full-year scenario (Fig. 1B), the mean body weight reported by persistent WegovyCare® users was 84.8 kg, corresponding to a 20% weight loss. We observed low bias in the prediction of the full-year scenario at all time points (ranging from -0.6 kg to 0.6 kg). Model precision for predicting categorical weight loss at 52 weeks was high (AUC from 0.75 to 0.92) and improved with time.

Conclusion: We demonstrated that long-term weight loss can be predicted with high precision and low bias from self-reported information on sex, dose, and body weight during initial treatment with semaglutide. Patients treated with weight management products as well as health care professionals may benefit from having a weight predictor integrated into a patient-support solution to better guide decision-making and dose adjustments towards individual treatment targets.

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Model precision for predicting categorical weight loss in (A) the half-year treatment scenario (26 weeks +/- 4) and (B) the full-year treatment scenario (52 +/- 4). In scenario A, predictions were made from time points 4, 8 and 16 weeks (n=596).In scenario B, predictions were made from time points 8, 16 and 28 weeks (n=212).

Fig. 1.

PO4.096

Qualitative changes in body composition following a very low-calorie ketogenic diet: usefulness of bioelectrical impedance vector analysis

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Introduction: Obesity represents a major global public health challenge, contributing to increased morbidity, disability, mortality, and rising public healthcare costs (1). Among dietary strategies for supporting people with obesity, the Very Low-Calorie Ketogenic Diet (VLCKD) has proven to be particularly effective (2). Monitoring body composition during VLCKD is essential to optimize health outcomes, address potential complications, and promote overall well-being. In this context, Bioelectrical Impedance Vector Analysis (BIVA) has gained attention as a valuable alternative to traditional Bioelectrical Impedance Analysis (BIA) for qualitatively assessing and tracking body composition (2). Unlike BIA, BIVA offers more detailed insights into hydration status and cellular health while avoiding the potential biases associated with BIA predictive equations (3). This makes BIVA an essential tool for qualitatively monitoring body composition during nutritional interventions. Although BIVA is widely applied in clinical and athletic settings, its use in individuals undergoing VLCKD for weight management remains underexplored. This study aims to evaluate the quantitative and qualitative changes in body composition of people following a VLCKD using BIVA.

Methods: This retrospective longitudinal study analyzed body composition, assessed through BIVA, in 35 individuals (30 women, mean age 48 ± 14 years; mean BMI 32.4 ± 4.6) undergoing weight management with VLCKD at the University Hospital Campus Bio-Medico of Rome. Anthropometric data, demographic characteristics, clinical information, and BIVA measurements were collected at the start of the VLCKD (T0) and at the first follow-up nutritional visit (mean days 38 ± 12).

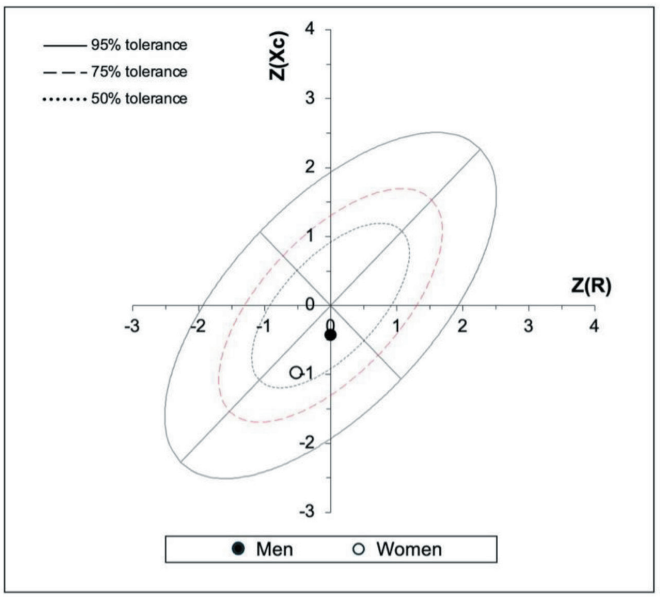
Results: At the follow-up nutritional visit (T1), significant reductions were observed in fat mass (35.9 ± 9.7 kg vs. 39.9 ± 10.1 kg, $p<0.001$), fat-free mass (44.6 ± 8.1 kg vs. 45.7 ± 8.2 kg, $p<0.001$), standardized phase angle (-0.2 ± 0.9 vs. 0.3 ± 0.8, $p=0.011$), and waist circumference (89.5 ± 11.0 cm vs. 94.6 ± 10.7 cm, $p<0.001$). BIVA showed that bioimpedance vectors for both women and men were positioned within the 75th percentile tolerance ellipses, typical of healthy (Figure 1). Furthermore, at T1, a significant rightward shift in the bioimpedance vector ($T2 = 7.7$, $F = 3.7$, $p<0.001$, $D = 0.46$) was observed, suggesting body fluid loss during the VLCKD protocol (Figure 2).

Conclusion: BIVA provides valuable insights into qualitative changes in body composition during VLCKD intervention, supporting evidence-based clinical and nutritional practices for people with obesity.

References

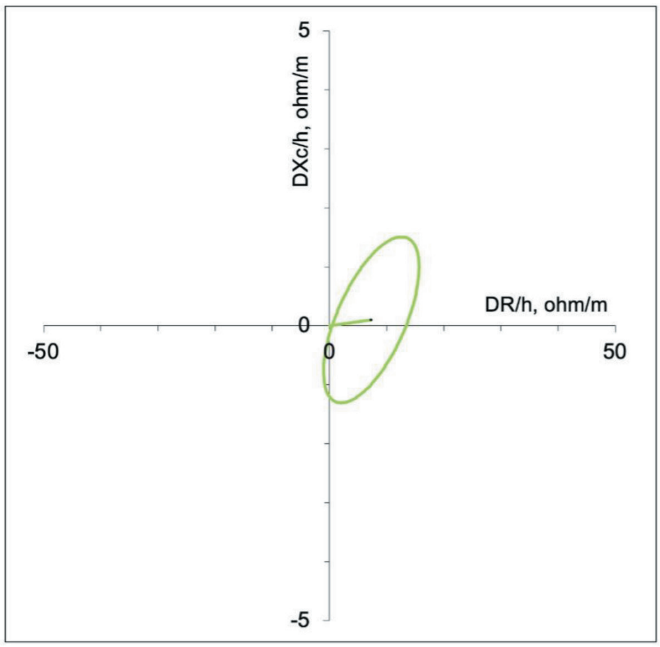
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Mean bioimpedance vectors (bivariate z-scores) plotted on the Rz-Xc Z-score graph. Filled circles and squares: men; hollow circles and squares: women.

Fig. 1.



Mean vector displacements with 95% confidence ellipses following VLCKD diet

Fig. 2.

PO4.097

Research on the Mechanism of Arachidonic Acid Metabolism in Metabolic Associated Steatohepatitis

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Objective: This study aims to investigate the mechanism of arachidonic acid metabolism in metabolic associated steatohepatitis (MASH), with the goal of providing new insights for clinical diagnosis and treatment.

Methods: A total of 78 patients with MASH and non-MASH were enrolled from August 2023 to March 2024 at Tianjin Medical University General Hospital. After obtaining informed consent, liver tissue samples and serum samples were collected. Transcriptome sequencing and metabolomics analysis were conducted, followed by bioinformatics analysis to explore the role of arachidonic acid metabolism in MASH.

Results: Transcriptome sequencing data indicated that the expression levels of key genes in arachidonic acid metabolism, such as ALOX-5 and CYP2C19, were significantly altered in MASH patients compared to non-MASH controls. Notably, ALOX-5 was upregulated, whereas CYP2C19 was downregulated. Metabolomics analysis revealed significant changes in the levels of arachidonic acid and its metabolites in the serum of MASH patients, including increased levels of pro-inflammatory mediators like leukotrienes and HEPE class eicosanoids, and decreased levels of FAHFA class substances. Functional enrichment analysis suggested that differentially expressed genes and metabolites were closely associated with the activation of arachidonic acid metabolism, inflammatory factors, and signaling pathways.

Conclusion: The findings of this study elucidate the significant role of arachidonic acid metabolism-related genes and metabolites in the pathogenesis of MASH. This provides a scientific foundation for a deeper understanding of the pathophysiological mechanisms of MASH and identifies potential targets for clinical intervention and prevention.

PO4.098

"Fair Play a Tavola": A Nutrition Education Project for Preschool-Aged Children

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Introduction: Proper nutrition education during preschool years is crucial for physical and cognitive development. However, initiatives targeting children aged 3 to 5 are limited. Data from the "Okkio alla Salute 2023" survey (monitoring weight status, eating habits, and physical activity in primary school children) highlight that 19% of children have excess weight, including 9.8% with obesity, alongside an alarming prevalence of "early adiposity rebound." In this context, the "Fair Play a Tavola" project was launched to promote healthy lifestyles in preschools in Rome, targeting approximately 5000 children aged 3 to 5 through classroom activities and digital tools.

Methods: The project included age-appropriate nutrition education sessions incorporating playful activities and sensory analysis, such as the "Look, Touch, Smell" game, where children differentiated fruits and vegetables based on appearance, texture, and scent. Screening was performed with parental consent, collecting data on weight, height, and waist circumference while children wore lightweight clothing without shoes. Parents completed a questionnaire on dietary habits and lifestyle. Screening results were shared with parents during sessions led by nutritionists and pediatricians, who offered personalized recommendations.

Results: The findings presented are preliminary, as the project is still ongoing and is expected to reach its target of engaging 5000 children in the coming months. As of now, it has engaged 1305 children, with 639 participating in the screening. Of these, 557 were aged 3 to 5 years, and questionnaire data were collected from 383 children. The analysis focused on this representative sample of the target population. Among the 383 children (174 girls, 209 boys; mean age 4.5 ± 0.93 years), 256 were within a healthy weight range (Group A), while 127 demonstrated signs of excess weight (Group B), highlighting an opportunity to support their health and well-being. Preliminary results showed significant differences in dietary habits and family characteristics. For example, 54% of children in Group A consumed fruit juice less than once a week, compared to 64% of children in Group B, who consumed it 1-3 times weekly. Similarly, 58% of parents in Group B reported daily consumption of processed meats, whereas

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52% of parents in Group A limited intake to 1-3 times weekly. Parental anthropometric data and education levels also differed. Maternal BMI was higher among families of children in Group B (23.1 ± 4 kg/m² vs 22 ± 3 kg/m²), as was paternal BMI (26 ± 3 kg/m² vs 24 ± 2 kg/m²). Additionally, 62% of parents in Group A held a university degree, compared to families in Group B, where the highest parental education level was typically a high school diploma.
Conclusions: Preliminary findings confirm the multifactorial influences on children's growth and development, emphasizing the importance of early educational interventions involving not only children but also their families and teachers. This project demonstrated how small, targeted steps can create meaningful opportunities to nurture healthier habits for children and support positive changes within their families.

PO4.099

The Values of 60-Minute of OGTT Plasma Glucose Levels for Risk for Future Type 2 Diabetes in Persons Living with Obesity

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Introduction: An oral glucose tolerance test (OGTT) is a known test for diagnosing prediabetes and type 2 diabetes, however, the role of glucose levels at the 60-minute of OGTT in persons living with obesity has not been enough investigated. The aim of this study was to examine the role of 60-minute plasma glucose levels during OGTT as a predictor for the development of diabetes after 10 years in person living with obesity, all of whom had normal fasting glucose levels (<6.1 mmol/L) at the baseline.
Methods: The study included 153 persons living with obesity, all with normal fasting glucose levels (<6.1 mmol/L) at baseline, who underwent an OGTT 10 years ago. Based on the 60-minute plasma glucose levels, patients were divided into two groups: one with glucose ≥8.6 mmol/L (Group 1, n=64, aged 43.33±1.98 yrs, BMI 44.32±1.74 kg/m2kg/m2) and the other with glucose <8.6 mmol/L (Group 2, n=89, aged 40.44±1.59 yrs, BMI 42.87±0.96 kg/m2kg/m2). After 10 years, we investigated the incidence of type 2 diabetes in both groups. Statistical analysis included the chi-square test to compare proportions and the calculation of relative risk (RR) for the development of type 2 diabetes.
Results: In the group with glucose ≥8.6 mmol/L, 21 out of 64 patients developed diabetes (32.8%), while in the group with glucose <8.6 mmol/L, 15 out of 89 patients developed diabetes (16.9%). The relative risk (RR) for the development of diabetes in the higher glucose group (Group 1) was 1.95 (95% CI: 0.91 - 4.17). The chi-square test revealed a statistically significant difference between the two groups ($\chi^2 = 4.59$, $p < 0.05$).
Conclusion: Our study suggests that 60-minute plasma glucose level during OGTT is a significant predictor of diabetes development in persons living with obesity, even when all patients had normal fasting glucose levels at baseline. The relative risk for developing diabetes after ten years was almost double in patients with glucose levels above 8.6 mmol/L at 60 minutes, highlighting the importance of measuring plasma glucose at this time point to identify individuals at high risk for diabetes development. These findings may contribute to improving early detection and prevention strategies for diabetes in persons living with obesity.

PO4.100

High-protein ready-to-eat snacks: Protein sources and health effects

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Introduction: Various experimental and longitudinal studies have shown that increased dietary snack intake contributes to higher energy intake and higher BMI. There is an increasing demand for high-protein ready-to-eat snacks for various reasons such as maintaining body weight, increasing muscle mass, satisfying snack needs or food cravings. This review examined the protein sources and health effects of high-protein ready-to-eat snacks.
Methods: A large-scale literature review was conducted to determine the protein content, consumption intention and preferences, and prominent health effects of high-protein ready-to-eat snacks. The review utilized databases accepted as reliable and sufficient data sources: Web of Science, PubMed, and Scopus. The following keywords were used to limit the search: 'high-protein', "snack," "protein source," "health effects," and "ready-to-eat food."
Results: Various food sources are utilized to increase the protein content of snacks. Whey protein and other nutrients from dairy products are the leading animal sources. Vegetable sources are quite diverse. The main plant sources are pea and its derivatives, chickpea, oat and its products, soybeans, and other beans. The main health benefits obtained include increased satiety, decreased need for meals, enrichment of amino acid profile, positive contributions to body weight control, increased fiber intake, and possible positive effects on glucose metabolism.
Conclusion: A growing interest is in high-protein snacks with healthy and safe ingredients. In these products, especially when plant sources are utilized, the positive effects on cardiovascular health and high sustainability effects stand out. However, it should be kept in mind that many factors, especially the target group, should be taken into consideration for the development of high-protein ready-to-eat snacks.

PO4.102

Real-world efficacy of setmelanotide in adults living with rare genetic forms of obesity

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Introduction: The efficacy of the MC4R receptor agonist setmelanotide has been demonstrated in phase 3 clinical trials in patients living with monogenic obesity caused by biallelic variants in the leptin receptor (LEPR) and pro-opiomelanocortin (POMC), or by Bardet-Biedl syndrome (BBS). The purpose of this study is to evaluate the real-world effectiveness and safety of setmelanotide in adults from this population who were either continuing the treatment after the end of a clinical trial or starting it in routine care in France under a pre-marketing early access authorization.
Patients and Methods: This retrospective monocentric analysis includes data from 16 French patients with a biallelic variant in the LEPR (n=4) or POMC (n=2) genes or living with Bardet-Biedl Syndrome (n=10) treated with setmelanotide between 2022 and 2024. Eleven patients were included at treatment initiation and five patients were continuing treatment after receiving setmelanotide in a clinical trial. The average follow-up was 14.4 months.
Results: A significant weight decrease, averaging 20% of the previous maximum weight ($p < 0.01$, Welch ANOVA), was observed during the first year of treatment. This weight loss was maintained in patients who were already on treatment when included in this study. A significant decrease in hunger score (-4.4 points, p=0.01) and Food Craving Score (-41%, p=0.02) was also observed. The onset of symptoms of depression or anxiety was monitored during follow-up using the Hospital Anxiety and Depression scale (HAD). Overall, tolerance was comparable to data published in Phase 3 trials.

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Conclusion: These real-world data of adult patients with rare genetic forms of obesity who received setmelanotide under pre-marketing early access authorization show improvements in hunger scores and weight outcomes that are consistent with phase 3 data without any new safety signals.

Conflicts of interest: CP, KC and SC are clinical trial investigators for Rhythm Pharmaceuticals, Inc. JM has consulted for Rhythm Pharmaceuticals, Inc.

Funding: Rhythm Pharmaceuticals, Inc. was not involved in the study design, collection, analysis, or interpretation of data, the writing of this abstract or the decision to submit it for communication.

PO4.103

Relationship between cardiometabolic index and obesity-related complications

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Introduction: Obesity is a complex disease characterised by excessive adiposity that impairs health. Obesity is associated with the risk of developing a broad set of comorbidities, termed obesity-related complications (ORCs), which can affect all organ systems. These ORCs are associated with reduced quality of life and life expectancy among people with obesity. The cardiometabolic index (CMI) has emerged as a novel marker for evaluating the distribution and dysfunction of visceral adipose tissue, yet its correlation with numerous diseases, particularly new-onset chronic conditions, remains underexplored. We aimed to examine the relationship between CMI with ORCs.
Methods: The retrospective study included 280 participants with obesity, among them, 59.1% were women, the mean age was 42.50 ± 0.21 years and man 40.95%, mean age 44.19 ± 0.15 years. According to the CMI quartiles, participants were subdivided into four groups: CMIQ1 (CMI < 0.70; n = 65), CMIQ2 (CMI: 0.71–1.33; n = 80) CMIQ3 (CMI :1.34-3.5; n = 75) and CMIQ4 (CMI >3.6, n=60). ORCs were tabulated based on coded diagnoses. These 13 conditions, termed ORCs in this study, were: prediabetes, type 2 diabetes (T2D), hypertension, heart failure, dyslipidaemia, atherosclerotic cardiovascular disease (defined as experiencing at least one of coronary heart disease, peripheral artery disease, cerebrovascular disease and atherosclerosis), obstructive sleep apnoea (OSA), osteoarthritis, chronic kidney disease, gastro-oesophageal reflux disease, metabolic associated fatty liver disease (MAFLD), infertility and mental health problem (anxiety, depression).
Results: Participants with higher CMI tended to be females [32.82% in CMIQ1 vs. 67.18% in CMIQ4],with younger ages and higher BMI. In Groups CMIQ3 and CMIQ4 participants had multiple ORCs. The most prevalent ORCs in CMIQ4 among females were T2D, dyslipidemia, hypertension and infertility, and among males were T2D, hypertension, dyslipidemia, atherosclerotic cardiovascular disease, MAFLD and OSA. We didn't find the difference in ORCs between females and males in CMIQ1. The most prevalent ORCs in CMIQ1 were prediabetes and dyslipidemia. We determined significant positive correlation between CMI and BMI (r=0.35, p< 0.001), DBP (r=0.24, p<0.05), HbA1c (r=0.43, p<0.001), TC (r=0.26, p<0.05) and HOMA-IR (r=0.346, p<0.001) in males. In females we determined positive correlation between CMI and BMI (r=0.322, p<0.001), SBP (r=0.23,p<0.05), DBP (r=0.19, p<0.05), TC (r=0.22,p<0.05) and HOMA-IR (r=0.391, p<0.001), HbA1c (r=0.33, p<0.001). We founded sex –specific variations in ORCs. Females participants had higher odds than males for osteoarthritis, depression and infertility, while males participants had higher odds for OSA and MAFLD.
Conclusion: Our results showed that participants with higher value of CMI had multiple ORCs.

PO4.104

Ongoing project: Smart nutrition, healthier communities: A digital therapeutic strategy for obesity management

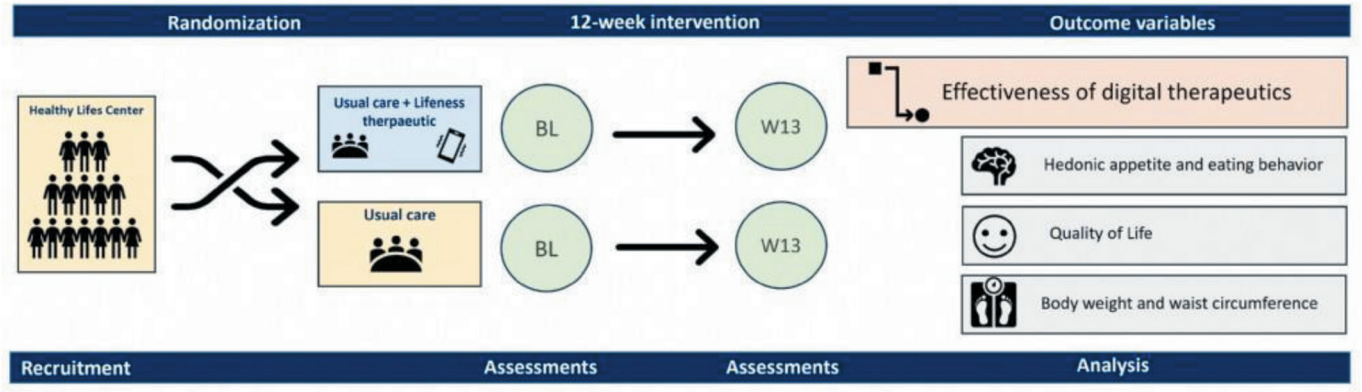
Aukan, M. I.[1]*; Meland, T. I.*[2]*; Larsen, M. A.*[3]

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[3]Department of Clinical Medicine, The Arctic University of Norway (UIT)

Background and Rationale: Obesity is a significant public health challenge. In municipal healthcare settings resources are limited and scalable interventions are scarce. Traditional approaches to obesity management often emphasize treatment rather than prevention, overlooking crucial opportunities for early intervention. Moreover, evidence suggests that dietary interventions aimed solely at weight loss do not lead to sustained improvements in eating behavior among individuals with obesity, increasing the risk of weight regain. The "Smart Nutrition, Healthier Communities" project seeks to address these issues by introducing Lifeness, an AI-integrated digital therapeutic platform designed to deliver personalized dietary interventions that promote long-term behavioral change.
Hypothesis and Aims: We hypothesize that the integration of the Lifeness platform with standard care will result in significant improvements in hedonic appetite control, eating behaviors, and quality of life compared to standard care alone. Additionally, Lifeness is hypothesized to reduce the risk of weight regain by fostering sustainable lifestyle changes. The study aims to:
1. Evaluate the impact of the Lifeness platform on hedonic appetite control and eating behaviors in individuals with a BMI over 27.
2. Assess the usability and user engagement with the Lifeness platform in a municipal healthcare setting.
3. Explore the potential of Lifeness to prevent weight regain by promoting sustainable dietary and lifestyle changes.

Methods: This 12-week feasibility study will recruit 40 adult participants with a BMI over 27 from the Friskliv og Mestring centers in the Værnes region. Participants will be randomized into two groups: 1) Standard follow-up with the addition of Lifeness, and 2) Standard follow-up alone. Lifeness uses artificial intelligence (AI) and photo recognition technology to provide personalized nutrition advice and support sustainable lifestyle changes. Primary outcomes will include the platform's impact on hedonic appetite control, eating behaviors, and quality of life, assessed through anthropometric measurements and validated psychometric questionnaires at baseline and after 12 weeks. The study will also evaluate the usability and participant- and healthcare provider engagement with the Lifeness platform.
Conclusion: This ongoing study will assess the potential of Lifeness as a tool for obesity management in municipal healthcare settings. By focusing on personalized dietary interventions, appetite regulation, and lifestyle modifications, the project aims to shift the emphasis from reactive treatment to proactive prevention. A key focus will be the platform's potential to prevent weight (re)gain, a common issue with diet-only interventions, by supporting long-term behavioral changes. Data collection will be completed in january 2025. The findings will provide crucial data for larger-scale efficacy trials and could help develop more effective, scalable obesity management strategies in community health settings.

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Brief overview of the study design

Fig. 1. Study design.

PO4.105

Studying the role of metabolic syndrome in the progression of chronic heart failure

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Introduction: Chronic heart failure (CHF) is regarded as the last phase of the cardiovascular continuum. Globally, according to the Global Burden of Disease study, the prevalence of CHF increased by 29,4% from 2010 to 2019. Enhancing the prognosis of the underlying disease resulted in elevated survival rates, which subsequently increased the prevalence of CHF. There is a more severe course of CHF in patients with comorbid conditions such as abdominal obesity, atherosclerosis, diabetes mellitus (DM) (Screever E. M. et al., 2023). The role of obesity and metabolic syndrome (MS) remains a subject of study, as these are probably the key links in the pathogenesis of CHF progression at the moment.

Methods: The study included 108 patients (53 men and 55 women) of the therapeutic department, The average age – 66.05±5.5 years. Random sequential sampling was used to choose all of the patients. Analyses of laboratory, instrumental, and clinical and anamnestic data were conducted. The anthropometric assessment encompassed measures of weight, waist circumference (WC), hip circumference, and body mass index (BMI). The severity of MS was evaluated according to the Russian Federation Patent No. 2444298, titled "Method for Diagnosing Metabolic Syndrome" (Lutov Yu.V., Selyatitskaya V.G., 2012). Patients were categorized into three groups based on the stage of CHF progression: group 1 (n=45) – with stage B, group 2 (n=48) – stage C, group 3 (n=15) – D.

Results: Patients in all three groups did not differ considerably in age, the average age of patients in groups 1, 2 and 3 was 65.2±3.8; 66.4±6.7 and 66.9±5.7 years (p>0,1), respectively, and in BMI – 31,4±4,8; 32,7±4,5; 33,8±6,9 kg/m2 (p>0,1).

It was discovered that as the stage of CHF advances, so does WC in patients. The values of WC in groups 1, 2 and 3 were 105.3±12.6; 108.0±10.8 and 116.6±14.5 cm, respectively (p<0.05).

MS occurred in groups 1 and 2 in 90% of instances, in persons from group 3 in 100% of cases. A comparative study of the components of MS showed that as CHF advanced, the frequency of hypoalphacholesterolemia increased (in group 1 – 29%, in group 2 – 42%, in group 3 – 80%; p<0.05). The grouping of MS by severity revealed a considerable disparity in the proportions of mild, moderate, and severe cases among the categories. Consequently, severe MS was identified in 56% of patients in the first group, 69% in the second group, and 100% in the third group.($X^2 = 4.55$, $p < 0.05$). Correlation analysis of MS components with echocardiography indicators revealed a negative correlation of the left ventricular ejection fraction with WC, glycemia level and the severity score of MS (rs=-0.19; -0.21; -0.27, respectively; p<0.05) and a positive correlation with the level of HDL (high–density lipoproteins) (rs =0.29; p<0.05).

Conclusions: The findings collected show a substantial involvement of visceral adipose tissue and MS in the development and progression of CHF. The following components have the most significant effect on the course of CHF: abdominal obesity, hypoalphacholesterolemia, hyperglycemia.

PO4.106

An all-natural, very low-calorie ketogenic diet (VLCKD) protocol has similar efficacy and safety to commercial meal replacements (whole or partial) in inducing weight loss: results from a prospective, controlled, 4-arm pragmatic trial (KOBE trial)

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Introduction: VLCKD has gained increasing popularity in obesity treatment due to its rapidity in inducing weight loss and in improving metabolic indices. The EASO 2021 guidelines (1) describe a protocol based on commercial meal replacement using predominantly plant-based protein sources, on the grounds of higher metabolic safety and patient compliance compared to an all-natural food protocol based on animal proteins. However, the evidence supporting this approach is limited and, in addition, meal replacement may not be affordable for all patients. To our knowledge, no prospective intervention studies have so far compared the efficacy and safety of VLCKD protocols carried out with all-natural foods vs meal replacement (whole or partial).

Methods: the KOBE trial is a pragmatic prospective study where results are presented for 100 consecutive patients (76 F, 24 M, mean age 53.5±11.3 yrs) with obesity (mean weight 94.2±23.3 kg, 66% having insulin resistance, prediabetes or T2DM). They were assigned - according to personal preference – to one of the following 4 arms: A) 4 natural food meals/d (n=29); B) 3 natural food meals +1 protein powder meal/d (n=24); C): 2 natural food meals + 2 meal replacement products/d (n=26); D): 4 meal replacement products/d (n=21); plus integration of potassium and magnesium citrate, omega-3 (1 g/d), a multivitamin preparation, as well as ursodeoxycholic acid in prophylactic dose. The ketogenic phase (duration: 6 or 8 weeks according to initial BMI) was followed by a gradual carbohydrate reintroduction over a 20-week period. Safety was monitored by serum creatinine, urea, uric acid, electrolytes, glucose, liver function tests, total cholesterol determination at 2, 12, 24 weeks. Body composition was assessed by bioimpedance analysis (Akern™ BIA 101).

Results: During the study period, 29 dropouts occurred (29% of total), of which 17 during the ketogenic phase. The most frequent reason was poor

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compliance (10 pts), with no difference in prevalence across study arms; significant side effects occurred in 3 pts (abdominal pain and severe asthenia). Dropouts were significantly older (p=0.048) than non-dropouts. At the end of the ketogenic phase, a mean % weight loss of 8.4±2.9 was observed, while at the end of the carbohydrate reintroduction period, total % weight loss was 10.7±4.3. There was no significant difference in weight loss or fat-free mass among different study arms. During the ketogenic phase, a mild and transient rise in serum creatinine and uric acid was observed, which was consistent across all study arms with no significant differences among dietary protocols.
Conclusion: This pragmatic study shows that a VLCKD based on natural foods has similar efficacy and safety to a VLCKD based on complete meal replacements, but also to mixed protocols. The dropout rate during the ketogenic phase was relatively low, possibly due to the possibility for patients to choose their preferred mode. These findings are important to increase the number of patients who can afford VLCKD and to provide them with greater dietary flexibility.

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Conflict of Interest: None

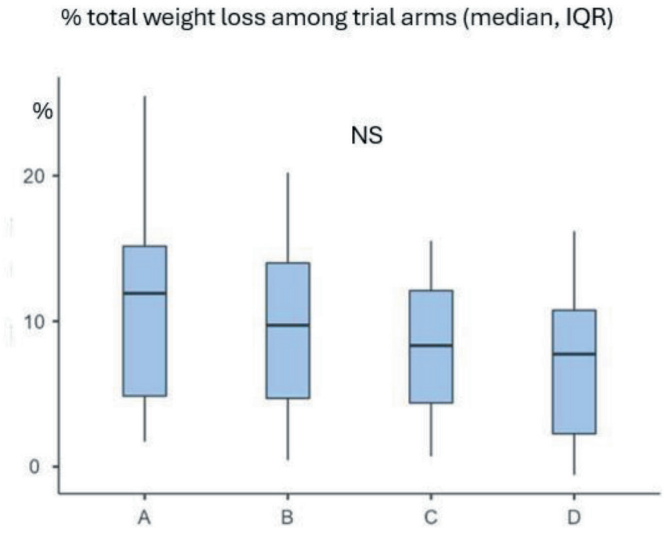


Fig. 1.

PO4.107

Adherence to Behavioral Weight Management: A Scoping Review of Definition, Measurement and Facilitators

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Introduction: Adherence is an essential indicator of weight management success. However, adherence to weight management show substantial variability with definitions and operationalization, posing limitations for research, surveillance efforts, policy formulation, and comparisons across studies. This study aimed to: (a) identify definitions for adherence; (b) identify and map adherence components; (c) examine adherence measurement methods reported; and (d) identify behaviour change techniques for enhancing adherence in the literature.
Methods: A scoping review was conducted following PRISMA-ScR guidelines, using a comprehensive search strategy applied to four databases of peer-review studies (Web of Science, PubMed/MEDLINE, Scopus and Cochrane).
Results: After the screening process, 182 papers were included. Findings from the data synthesis showed variability in the definition and operationalization of adherence across studies, and the most frequent components of adherence in the context of weight management included: 1) adherence to dietary behaviors, 2) adherence to physical activity, 3) attendance of intervention sessions, 4) self- monitoring of weight, 5) adherence to exercise, 6) adherence to medication, 7) attrition, 8) retention and 9) dropout.
Conclusion: In this scoping review, it is recommended to adopt the WHO's definition and framework to operationalize adherence, with modifications tailored to the specific weight management context. And the measurement guidelines summarize all measures, the selection of appropriate measures with standardized metrics will improve evidence accumulation and replicability in research. This scoping review also identified behaviour change techniques that were reported to be associated with adherence in studies. The main ones were self-monitor behavior and social support were reported as ways to improve adherence.

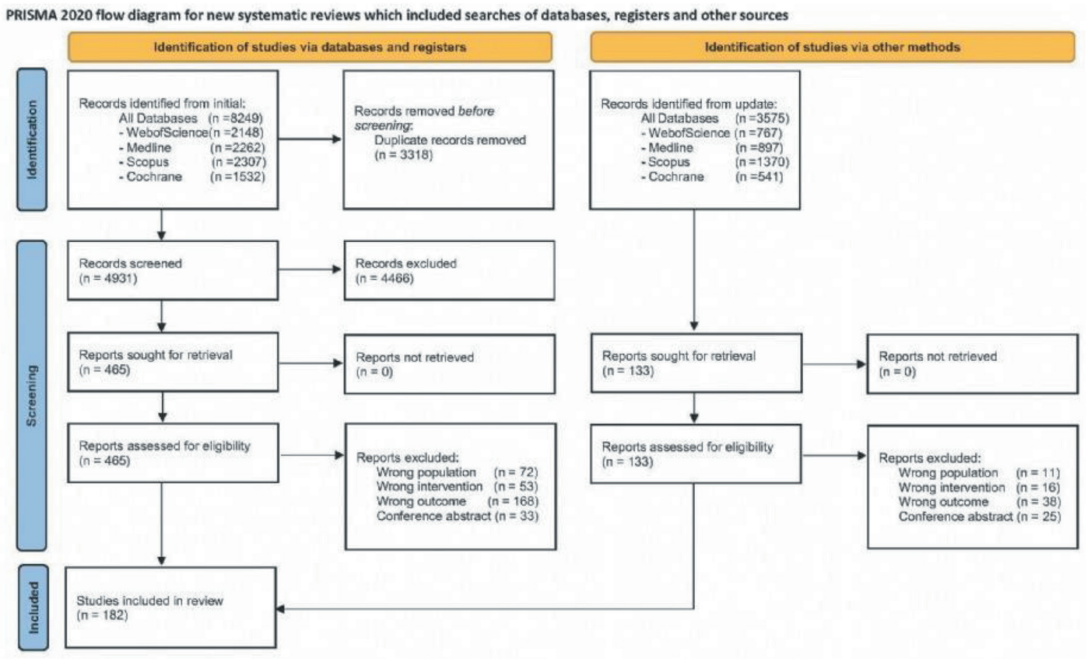


Fig. 1. PRISMA Flow Diagram.

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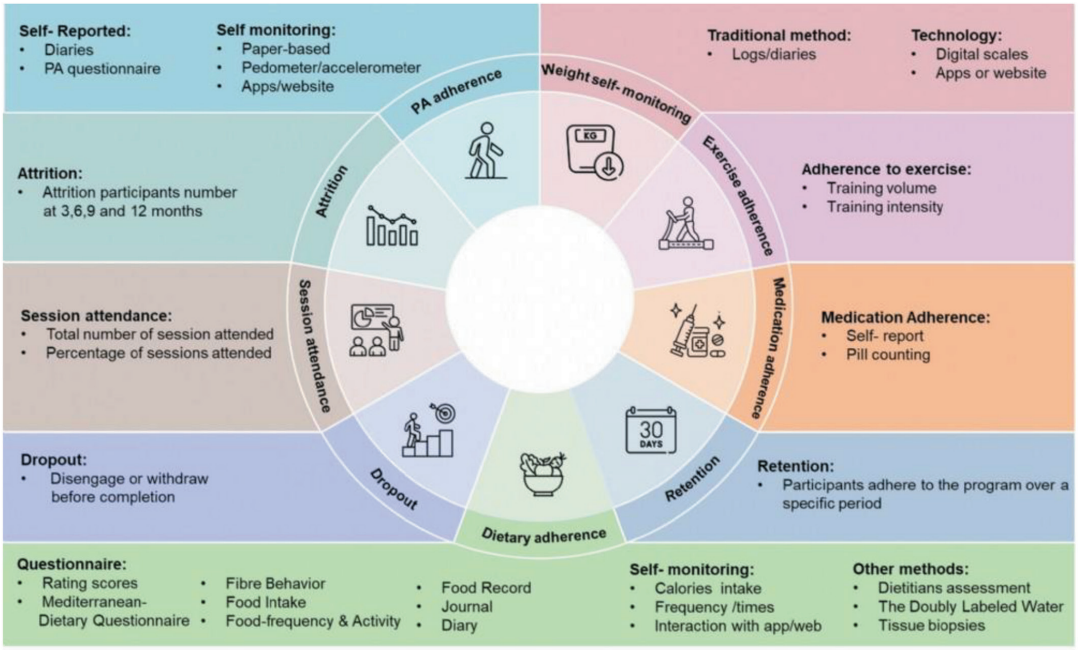


Fig. 2. Measurement guidelines and components.

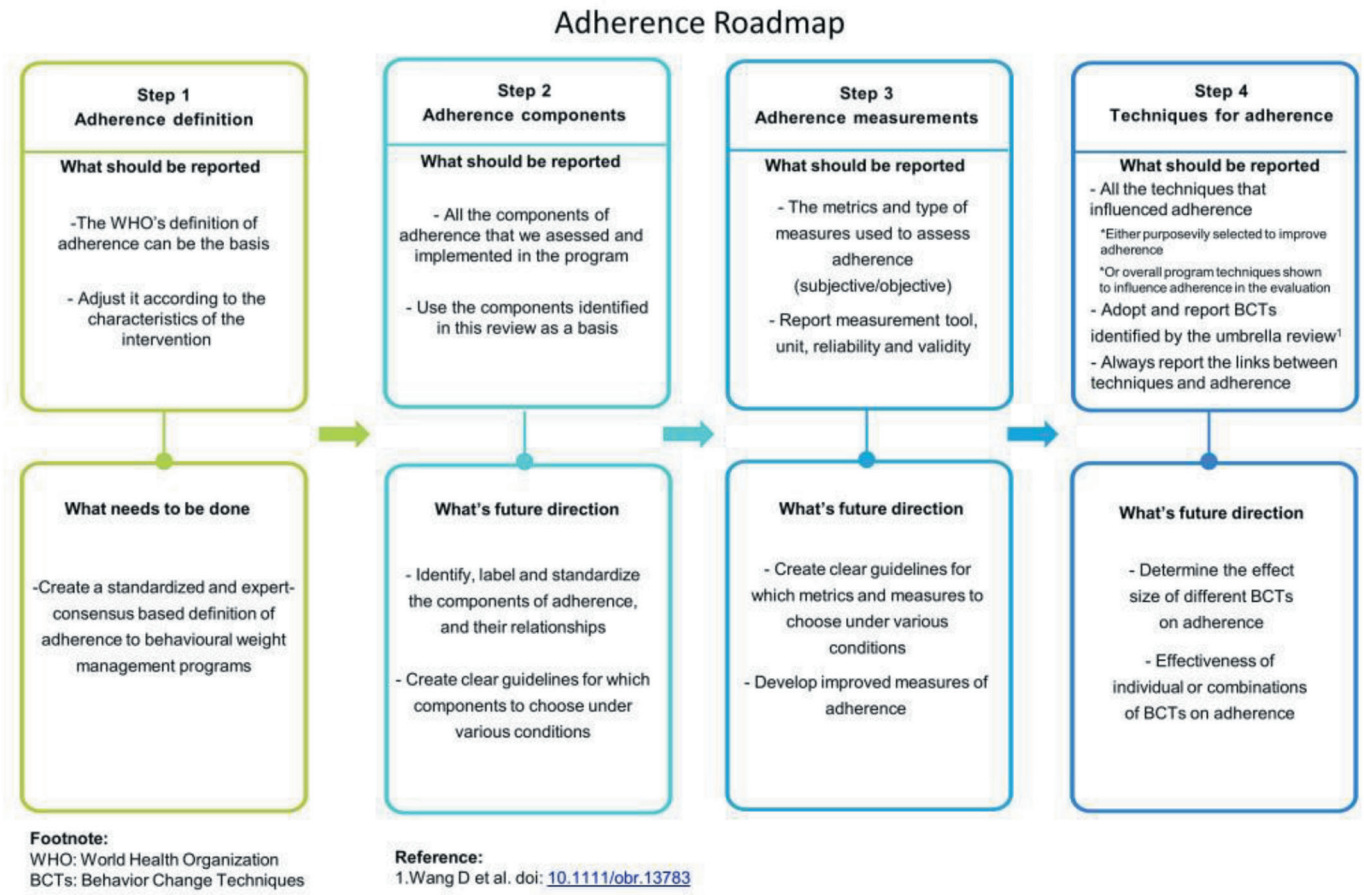


Fig. 3. Roadmap for adherence.

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Tab. 1. Terminology and definitions of adherence.

Term	Definition	Reference
Adherence	Adherence can be defined as the extent to which a person's behaviour corresponds with agreed recommendations.	Burgess et al. (2017)
Adherence	Adherence is defined as the level in which individuals comply with prescribed treatments or instructions.	Andersen et al. (2022)
Adherence	Adherence, defined as the "extent to which patients follow instructions given to them for prescribed treatments," is essential for achieving successful health outcomes.	Stinson et al. (2020)
Adherence	The extent to which a person's behavior: taking medication, following a diet, and/or executing lifestyle changes, corresponds with the 'agreed recommendations' from a health care provider.	Ihm et al. (2022)
Adherence Compliance Nonadherence Attrition	Adherence was described by the WHO as "the extent to which a person's behavior-taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider". A synonym commonly used in many publications is "compliance". Nonetheless, adherence is perceived as more neutral, emphasizing on the self-regulatory actions of an individual while compliance is perceived as paternalistic, emphasizing obedience to instructions. For this reason, adherence is used more often than compliance. Nonadherence implies the extent to which a person did not follow recommendations from health care providers, which hampers both external and internal validity or research studies. Attrition, which is an extreme form of non-adherence, is the most commonly reported adherence indicator in lifestyle modification programs as well as other weight loss programs.	Leung et al. (2017)
Technology adherence	Technology adherence, defined as the percentage of users who follow an intervention's intended use pattern, affects the implementation of large-scale digital health interventions	Andrade et al. (2021)
Technology adherence	Adherence to digital interventions has been succinctly defined as "a composite measure encompassing time online, activity completion, and active engagements with the intervention".	Lehmann et al. (2024)
Adherence to self-monitoring	Adherence to self-monitoring weight-related behaviors (i.e., exercise, weight, diet), as defined by the frequency of recommended recording, is associated with greater weight losses in BWL interventions.	Goldstein et al. (2019)
Adherence to medication	Adherence to medication is defined as the extent to which patients follow their healthcare providers' recommendations,9 and for patients with chronic diseases, it is linked with disease control, hospital admission rate, morbidity, and even mortality.	Ko et al. (2022)
Attrition	Program attrition, defined as leaving a program before its designated completion.	Isaman et al. (2021)
Attrition	Attrition is defined as failing to return, refusing to return, or being expelled from a treatment programme.	Pirotta et al. (2019)
Attrition/ Dropout	Dropout of weight-loss diet has been defined as attrition or failure to continue weight-loss treatment at any stage until the end of treatment.	Bazrafkan et al. (2021)

Tab. 2. Behavior Change Techniques (BCTs) promoting adherence.

Reference	BCTs	Detail description	Evidence type
Antoun et al. (2022)	Self-monitor behaviour BCT BCIO:007024	Some studies in this review and the literature suggest that greater adherence to self-monitoring has been associated with greater weight loss. However, many articles do not provide detailed measurements of adherence to self-monitoring in weight loss apps.	Systematic Review and Meta-analysis
Burgess et al. (2017)	Goal setting BCT BCIO:007002 Arrange emotional support BCT BCIO:007036	Behavioral treatment strategies (e.g. goal setting, motivational interviewing.) improve adherence to lifestyle intervention programmes in adults with obesity. This meta-analysis shows that behavioural treatment interventions have a significant positive effect on session attendance (percentage) and physical activity (total min/week) in adults with obesity (M = 17.63 (95% confidence interval (CI) = 10.77, 24.50), z =5.0337, P < 0.0001 and M = 105.98 (95% CI = 58.64, 153.32), z =4.3878, P < 0.0001, respectively).	Systematic review and meta-analysis
Cavero-Redondo et al. (2020)	Self-monitor behaviour BCT (BCIO:007024)	mHealth self-monitoring: behavioral weight management interventions using lifestyle mHealth self-monitoring interventions showed a higher adherence than: (i) paper records at any time and (ii) any other intervention at six months and twelve months."	Systematic Review and Meta-Analysis
Dunn et al. (2019)	Self-monitor behaviour BCT	This correlation supports previous findings that adherence to self-monitoring, regardless of the method, is important in behavioral weight-loss interventions,11,18,26,37,38 and indicate that discovering new and simpler methods of DSM may improve tracking adherence and eventually weight-loss outcomes.	Randomized Trial
Antoun et al. (2022)	Self-monitor behaviour BCT BCIO:007024	Self-monitoring easy improve adherence. Nevertheless, studies have shown that off-loading the need for manual logging (e.g., keeping a food diary, taking pictures and scanning barcodes) reduces user burden and increases self-monitoring adherence. Of note, research has shown that the frequency rather than accuracy of self monitoring is more significant in weight loss. Future studies could examine the efficiency and accuracy of triangulating gesture data with image and sound in self monitoring for weight loss and actual weight loss.	Scoping review
Chhabria et al. (2020)	Social support BCT BCIO:007028	Supportive Accountability: Finally, consistent with Mohr's theory that supportive accountability could increase intervention adherence.	Randomized trial

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Saslow et al. (2024)	Social support BCT BCIO:007028	Participants mentioned factors that supported their adherence to and motivation for the intervention, including accountability by being in the intervention, preparing their meals ahead of time, feeling motivated by the weight loss success of others, seeing their own initial weight loss success, and support from the intervention coach.	Pilot study
de Bruin et al. (2019)	Social support BCT BCIO:007028	1.The main adherence barriers were the social pressure to eat, lack of time and lack of flexibility in participants' meal schedules. 2.Common adherence enablers were having a set routine, social support and accountability.	Pilot study
Gibson et al.(2017)	Self-monitor behaviour BCT BCIO:007024	A dietary intervention that is tailored to a person's dietary preferences (whilst still aligning with nutritional recommendations), may also improve adherence. For this reason, government-based dietary guidelines are a very useful tool to use when tailoring a dietary intervention, as they are intended as population approach that are designed to be adapted to different dietary, cultural and cost preferences. Encouraging individuals to self-monitor their food intake has also been shown to improve the success of weight loss attempts and maintaining dietary changes overtime.	Review
Goldstein et al. (2019)	Self-monitor behaviour BCT BCIO:007024	Overall, results of the current study indicate that continuing to assess and intervene on adherence to self-monitoring would be a useful endeavor for enhancing weight loss and weight maintenance in several types of BWL programs.	Randomized Clinical Trial
Hartmann-Boyce et al. (2019)	Self-monitor behaviour BCT BCIO:007024	This synthesis provides new insights into the implications of self-monitoring on weight loss and maintenance. It suggests that self-monitoring can range from an aid to increase adherence to behavior change targets to a tool for facilitating analysis and self-experimentation.	Systematic Review of Qualitative Studies
Lewis et al. (2019)	Social support BCT BCIO:007028, Goal setting BCT BCIO:007002 Goal strategising BCT BCIO:007008	Telephone and text message support (Motivational interviewing, goal setting, problem solving, stimulus control, and self-reinforcement) improved lifestyle intervention adherence and clinical outcomes when compared with standard care.	Randomized Clinical Trial
Li et al. (2020)	Social support BCT BCIO:007028	The text messages were developed by a team of medical and health professionals experienced in treating patients with overweight or obesity based on theoretically driven and empirically supported evidence. The topics were organized into six sections, including medicine, motivation, nutrition, activeness, coping strategies, and weight management. The results indicated that SMS reminders improved adherence for weight-loss medication in patients with overweight or obesity, and receiving five SMS per week led to a better improvement in medication adherence than three SMS per week.	Randomized Clinical Trial
Coupe et al. (2019)	Create behavioural contract BCT BCIO:007014	Behavioural contracts were ineffective in increasing adherence to physical activity goals in the short or long-term. It is unclear why contracts increased adherence to dietary changes but did not promote physical activity. Dietary goals specified in the contracts may have been more acceptable to participants or easier to implement than the physical activity goals, which would suggest that more work is needed in relation to goal development.	Systematic review
Pirotta et al. (2019)	Provide positive material consequence for behaviour BCT BCIO:007257, and Self-monitor behaviour BCT BCIO:007024	Strategies that successfully reduced attrition included the incorporation of financial incentives (n = 8), a multicomponent approach (n = 13), and use of self-monitoring technology (n = 4).	Systematic review and meta-analysis
Shetty et al. (2024)	Provide positive material consequence for behaviour BCT BCIO:007257	Financial incentives (Incentivizing behaviors associated with weight loss improved adherence to those behaviors and does not appear to spill over to non-incentivized behaviors.)	Pilot study
Rumbo-Rodríguez et al. (2020)	Self-monitor behaviour BCT BCIO:007024	The use of technology also seems to allow improvement in adherence to treatment, as it allows a simpler and faster self-monitoring. In addition, although more research is needed, this could improve more when the technology is accompanied by immediate feedback. However, future research should focus on this, as, despite the use of technology, adherence to dietary-nutritional treatment often decreases over time, resulting in less weight loss as time passes.	Systematic Review

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PO4.108

The Impact of GLP-1 Receptor Agonists (GLP-1 RAs) on Mental Health: A Systematic Review

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Introduction: Obesity and mental health disorders often coexist, creating complex challenges for clinical management. Conditions such as depression, anxiety, and binge eating disorder are frequently encountered in individuals with obesity, while certain psychiatric medications, including those used to treat psychosis or bipolar disorder, can exacerbate metabolic dysfunction by increasing appetite and promoting weight gain. GLP-1 receptor agonists (GLP-1 RAs), well-established for their effectiveness in weight management and metabolic improvements, have shown central effects that go beyond glycemic control and appetite regulation. By acting on GLP-1 receptors distributed in brain regions involved in mood regulation, cognition, and reward, these agents offer a dual mechanism of action. This has sparked growing interest in their potential to address both metabolic aspects and psychiatric comorbidities of obesity.
Methods: A systematic review was conducted using PubMed/MEDLINE and Web of Science databases, following PRISMA-ScR guidelines. Inclusion criteria encompassed human and animal studies examining the impact of GLP-1 RAs on mental health. Data from 81 selected studies were extracted and analyzed, focusing on mental health outcomes and reported adverse effects. Mechanisms underlying the neuroprotective and psychotropic effects of GLP-1 RAs were also explored in the review.
Results: GLP-1 RAs demonstrated notable antidepressant and anxiolytic effects, which were consistently observed in animal models and attributed to reductions in neuroinflammation, oxidative stress, and modulation of dopamine and serotonin pathways. In human studies, beneficial effects were reported on depressive symptoms, cognitive function, and binge eating behaviors, although findings were more variable due to study heterogeneity. GLP-1 RAs were also effective in reducing substance use behaviors, such as alcohol and nicotine consumption, with animal studies suggesting robust effects on reward system modulation. In contrast with earlier retrospective reports on adverse psychiatric events, including suicidal ideation, the safety profile of GLP-1 RAs is further supported by the Pharmacovigilance Risk Assessment Committee of the EMA.
Conclusion: GLP-1 RAs represent a promising tool for managing the intertwined challenges of obesity and its psychiatric comorbidities. Their dual effects on metabolic and mental health make them well-suited for integrated treatment strategies. However, the variability in human data, the predominance of preclinical studies, and the need for rigorous longitudinal trials limit the generalizability of current findings. Cautious monitoring is advisable in patients with significant psychiatric conditions already present.
Future research should focus on clarifying the mechanisms underlying psychiatric benefits and risks, optimizing dosing strategies, and evaluating their long-term safety and efficacy in diverse populations. These efforts will help define the role of GLP-1 RAs in comprehensive obesity care, addressing both physical and mental health outcomes.

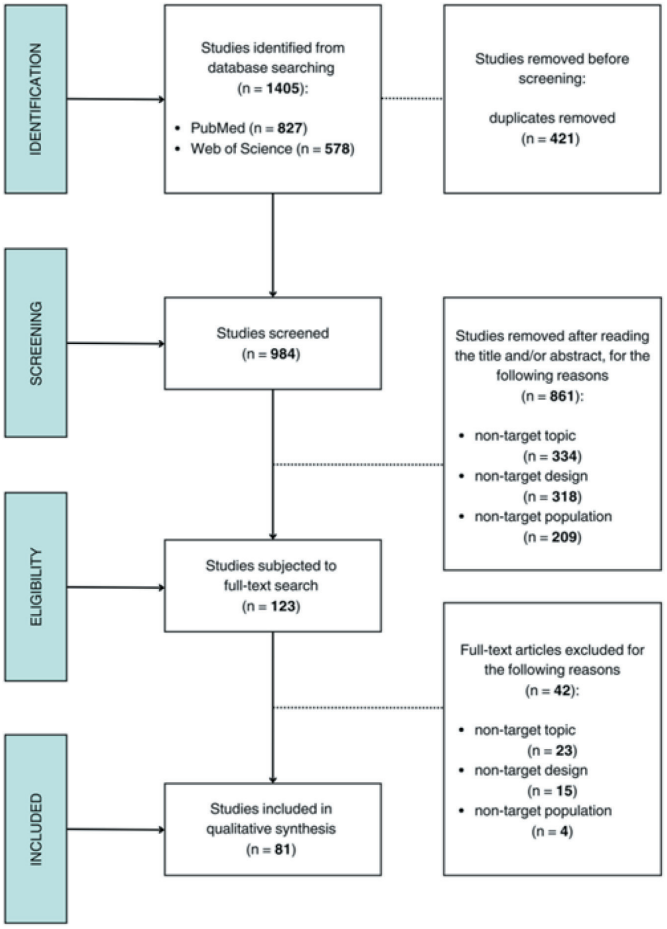


Fig. 1. Flowchart study selection.

PO4.109

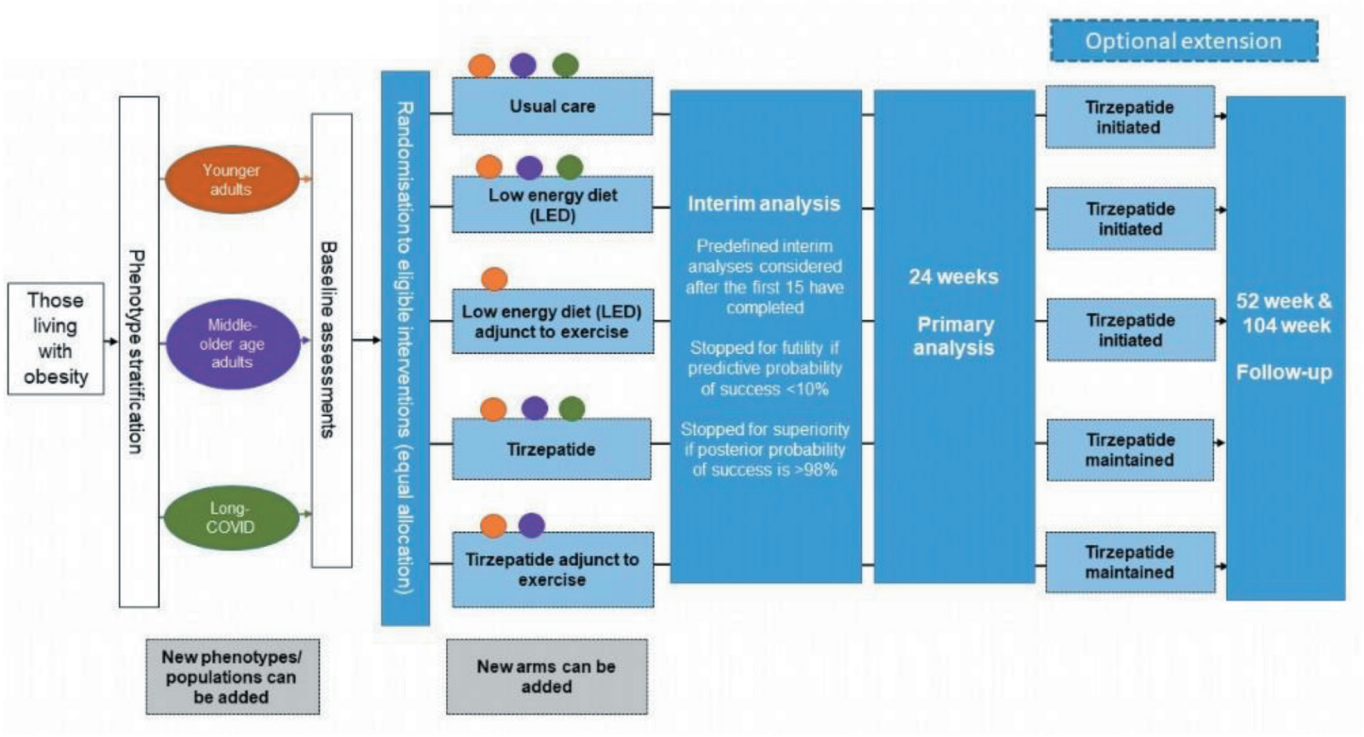
Introducing the OPAL (investigating and optimising physical function with weight loss) multi-arm open label adaptive platform trial

Yates, T.[1]*; Biddle, G. J. h.*[1]*; Henson, J.*[1]*; Mccarthy, M.*[1]*; Tom, W.*[1]*; Holmes, J.*[2]*; Mort, S.*[2]*; Papamargaritis, D.*[1]*; Davies, M. J.*[1]

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Background: Excess adiposity commonly coexists with impaired physical function (difficulty completing tasks of daily living) and reduced relative muscle strength, along with other indicators of physical frailty and sarcopenia. Whilst newer generations of weight loss therapies have revolutionised the management of obesity, there is a lack of evidence investigating impact on objective measures of physical function, cardiorespiratory fitness, and lean body mass quantity and quality. This uncertainly exists in the context of competing hypotheses suggesting incretin-based therapies may act to either blunt or improve the known effects of weight loss on functional capacity. Furthermore, the degree to which any observed effects can be enhanced with concurrent exercise training is also underexplored. OPAL provides an adaptive platform trial to investigate the efficacy of newer generations of weight loss therapies and equivalent dietary induced weight loss +/- exercise on physical function and lean mass in people living with obesity.
Methods: OPAL is a 24-week, open, prospective, adaptive, individually randomised, controlled platform trial. Participants are randomised into the arms for which they are eligible, initially available as: 1) usual care. 2)

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OPAL trial flow diagram

Fig. 1. OPAL trial design.

Tirzepatide (up to 10mg). 3) Tirzepatide plus supervised exercise. 4) Meal replacement plan (MRP) designed to provide equivalent weight loss to tirzepatide. 5) MRP plus supervised exercise. Arms can be stopped early for futility or superiority (via a planned interim analysis) and new arms added. Three different populations living with obesity will join the platform initially. 1) younger adults (18 to 44 years), 2) middle-aged to older adults (45 to 75 years), 3) adults with long-COVID (excluding the exercise arms). Up to 27 participants (depending on the interim analysis) need to complete each arm for each population based an 80% chance of correctly identifying a superior intervention (Bayesian modelling). Further populations will be added to the OPAL platform as funding allows. The primary outcome is the incremental shuttle walk test (a clinical measure of physical function) with gold standard measures of cardiorespiratory fitness (VO2peak), lower body strength (peak torque), and body composition (fat mass, appendicular and whole-body lean body mass, and bone mineral density via DEXA) acting as key secondary outcomes. Biopsies will allow further insight into muscle structure and function. After the primary timepoint (24 weeks) participants will be able to consent into an extended sub-study with all groups offered tirzepatide (either continued or newly initiated depending on prior group) with follow-up at 52 and 104 weeks.

Results: OPAL is currently open to recruitment, with initial results anticipated in 2026.

Conclusion: OPAL is the first adaptive platform trial designed to investigate the impact of newer generations of weight loss therapies +/- exercise on key objective measures of physical function, fitness, strength, and lean mass. Findings will help inform whether weight loss therapies can work in synergy with exercise to improve whole body health in different populations living with obesity.

PO4.110

Impact of chrononutrition on weight management in pre- and post-bariatric surgery patients

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Introduction: Chrononutrition explores how circadian rhythms and factors like meal timing and sleep patterns affect metabolic processes, including weight management. While research on the general population is extensive, studies on bariatric surgery patients are scarce, despite nearly 25% experiencing significant weight regain. This study examines the role of chrononutrition in BMI regulation among individuals with severe obesity and those who have undergone bariatric surgery to improve long-term weight management strategies.

Methods: We conducted an observational case-control study with 121 patients with obesity: 69 on a bariatric surgery waitlist and 63 who had undergone surgery. Data on BMI (pre-surgery, post-surgery, and current) were collected for the latter group. All participants completed a modified Chrononutrition Profile Questionnaire (CPQ) assessing eating patterns (e.g., skipping meals, late-night snacking) and sleep duration (sleeping more or less than 7 hours).

Results: No significant differences in eating habits were observed between the waitlist and the surgery groups. Among patients on the waitlist, those who both skipped breakfast and slept less than 7 hours had a higher mean BMI compared to those who did not skip breakfast (43.87 vs. 40.71 kg/m², p=0.006) and those who slept 7 or more hours (44.86 vs. 44.11 kg/m²,

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p=0.046). Additionally, 75% of patients who slept less than 7 hours also skipped breakfast (p<0.05). However, no statistically significant associations were found between BMI and the remaining CPQ parameters. For patients who had undergone bariatric surgery (35 bypass and 28 sleeve gastrectomy), no significant associations were identified between actual BMI or BMI regain and the habits assessed by the CPQ. Nonetheless, differences were observed in late-night snacking (42.31% vs. 26.67%) and skipping breakfast (34.62% vs. 20%), which were more common among those who had undergone sleeve gastrectomy. Interestingly, this group also showed a higher percentage of weight regain compared to the bypass group (96.43% vs. 65.71%) and had the highest mean weight regain (+5.85 kg/m² vs. +3.27 kg/m², p=0.008). Finally, there was a trend toward improvement or stabilization in most health habits within the first 3–5 years after surgery. However, some habits appeared to deteriorate beyond this period.
Conclusion: Our study suggests that health-related habits may be interconnected and may differ between patients with obesity and those who have undergone gastrointestinal surgery. Sleeping less than 7 hours was associated with skipping breakfast, which was linked to higher BMI in patients on the waitlist. In the intervention group, weight regain was higher among patients who underwent gastrectomy, who also reported higher rates of skipping breakfast and late-night snacking. However, no direct relationship between weight regain and health habits could be established, highlighting the need for further research to strengthen the evidence.

PO4.111

Cost-effectiveness of endoscopic bariatric procedures versus laparoscopic sleeve gastrectomy and semaglutide for obesity management: a model-based analysis

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Introduction: Endoscopic obesity treatments are likely cheaper and less invasive than bariatric surgery, making them a viable alternative. This study aimed to assess the cost-effectiveness of endoscopic treatments compared to alternative weight management interventions to inform decision-making from a UK health system perspective.
Methods: Three Markov models were developed to assess the cost-effectiveness of endoscopic sleeve gastroplasty (ESG) and intragastric balloon (IGB), compared to laparoscopic sleeve gastrectomy (LSG) or pharmacotherapy (two years of semaglutide) for adults with obesity. Model parameters were informed by an evidence map of studies on endoscopic treatment effectiveness, a systematic review of economic evaluations of endoscopic treatments, and clinical input. A cost-utility analysis was conducted based on the cost per quality adjusted life year (QALY), in line with UK economic evaluation guidance. A 5-year time horizon was used for the base-case analysis. Uncertainty was explored using deterministic and probabilistic sensitivity analyses.
Results: The results showed that LSG is likely cost-effective compared to ESG, for patients with obesity class II and III (£10,593/QALY-gained). For patients with obesity I and II, ESG was likely cost-effective compared to semaglutide (£7,267/QALY-gained); and semaglutide was dominant (cheaper and more effective) over IGB. Whilst the probabilistic sensitivity analysis showed some confidence in the base-case estimates, the model results were sensitive to reductions in procedure cost, and assumed weight regain for semaglutide in the deterministic sensitivity analyses. Limitations: Key limitations stemmed from the limited randomised controlled trials and direct comparative evidence for the modelled interventions. There was also limited long-term data on the interventions. Weight loss beyond 12 months for semaglutide relied solely on clinical assumptions. The findings should be interpreted with these limitations in mind.
Conclusion: The study findings show that LSG is cost-effective compared to ESG, ESG is cost-effective compared to semaglutide, and semaglutide dominates IGB. Future research should focus on: 1) collecting longer-term data on endoscopic treatment effectiveness; 2) directly comparing endoscopic treatments with semaglutide; and 3) using study designs that better reflect the complex treatment pathway for patients with obesity who might require multiple treatment options over time. Such studies would offer more robust evidence to further inform the cost-effectiveness of treatment beyond a 5-year horizon.

Conflict of Interest: AT,EF,KC have received funding from industry. At the time of writing the abstract, AT was an employee and shareholder of Novo Nordisk (NN). This work was funded before AT became a NN employee and NN has no role in this project. EF has received consulting fees from NN.

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PO4.112

Exercise Training Pre- and Post-Metabolic and Bariatric Surgery: An Overview of Systematic Reviews

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Introduction: An increasingly vast literature has focused on the potential impacts of exercise training (ET) on metabolic and bariatric surgery (MBS) outcomes. This overview of reviews was performed to distill the effects of pre- and post-MBS ET interventions into a single cohesive resource to guide clinicians and researchers in integrating ET into MBS programs to optimize health outcomes.
Methods: A literature search of seven electronic databases was performed and updated in 09/2023. In total, 24 reviews (4 exploring pre-MBS ET, 13 post-MBS, and 7 both) met preset PICOS eligibility criteria. Data were extracted from each review *as is*, and researchers assessed the risk of bias of all reviews, as well as the certainty of evidence from randomized controlled trial-only meta-analyzed outcomes. A flow diagram was created to systematically categorize the data for each outcome by first comparing results between reviews to reach a 1st conclusion of "Concordant", "Discordant", or "Inconclusive". Next, additional factors (i.e., presence of a meta-analysis, reported and calculated certainty of evidence, presence of mixed [non]randomized controlled trial results, absence of final trial data, sample size, inclusion of multiple publications from a single sample, variability in outcome measures/domains, and author conclusions in the reviews) were considered in the final categorization of outcome findings into "What we currently know", "What we think we know", or "What we still don't know".
Results: *What we currently know*: None. *What we think we know*: Pre-MBS ET likely has a (1) positive effect on BMI and 6-minute walking test distance, (2) positive effect on VO2max (combined results with physical activity counseling), and (3) non-significant effect on quality of life. Post-MBS ET likely has a (1) positive effect on body weight/BMI, waist circumference, bone mineral density, 6-minute walking test distance, muscle strength, and systolic blood pressure, and (2) non-significant effect on weight loss ≥12 months post-MBS, fat/fat-free/lean body mass, VO2max, resting heart rate, diastolic blood pressure, fasting insulin/glucose, total cholesterol, triglycerides, and low/high-density lipoprotein. *What we still don't know*: The impact of (1) pre-MBS ET on fat/fat-free/lean body mass, muscle strength, resting heart rate, blood pressure, glucose/lipid metabolism, habitual physical activity, adverse surgical events, and length of hospital stay, (2) post-MBS ET on quality of life and measures of glucose metabolism, (3) either pre- or post-MBS ET on any variable in the long term (i.e., >12 months).

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Conclusion: Despite the abundance of research on ET pre- and post-MBS, what we still don't know far exceeds what we know. A greater focus on enhancing methodological rigor and reporting of high-quality original research is needed to address this gap and develop evidence-based recommendations for ET to optimize pre- and post-MBS outcomes.

PO4.113

Identification of MHO/MUHO profiles in obese women

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Introduction: Obesity is a chronic disease with a variety of manifestations, and complications of obesity have been systematically associated with the condition. In recent years, metabolic phenotypes have emerged, with the so-called MHO (Metabolically Healthy Obesity) assuming that people with obesity do not necessarily have metabolic disorders. To this end, the authors have established different classifications based on clinical, anthropometric and biological criteria to differentiate between this MHO phenotype and the MUHO (Metabolically Unhealthy Obesity) phenotype, which is observed in individuals who have conditions consistent with metabolic disease in addition to obesity. The aim of this study was to identify the metabolic characteristics of the MHO/MUHO phenotype in women with obesity.
Methods: The present study comprised 267 women over the age of 18 years with a BMI>30 kg/m2. The NCEP- ATPIII criteria for metabolic syndrome were utilised to identify MHO/MUHO phenotypes, with the following parameters measured: fasting blood glucose, blood pressure, HDLc, triglycerides and waist circumference.
Results: The results showed that the 267 women had a mean age of 46 years and a mean BMI of 38 kg/m2. 179 (67%) of the women were classified as MHO, while 88 (33%) were MUHO, with more than 3 metabolic syndrome criteria. All 267 women had a waist circumference >80cm. Furthermore, 200 (75%) had HDLc levels of less than 50 mg/dL, and 125 (46%) had arterial hypertension.93 (34%) had triglyceride levels of more than 150 mg/dL.
Conclusion: In the present study, the MHO phenotype was found to be exclusive of any metabolic impairment. This finding suggests the potential for further investigation into the nature of adipose tissue, its inflammatory secretions, and the level of physical activity.

PO4.114

Sustainable long term weight loss: Insights from members who maintain significant weight loss beyond two years

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Introduction: Despite effective weight loss interventions, many individuals experience weight regain after initial success, and long-term maintenance of weight loss remains elusive. The purpose of this qualitative study is to identify factors important to long-term maintenance of weight loss from the perspectives of members who have maintained significant weight loss for two years or more. Findings provide insights that can inform future weight management interventions.
Methods: We conducted one-on-one interviews with 32 past members of The Livy Method (TLM) a weight loss program offered through a closed Facebook group. Participants, who self-identify as repeatedly trying to lose weight through various diets and experiencing weight loss and regain, had maintained their clinically significant (> 5% of body weight) weight loss for 2 years. Interviews were conducted virtually, lasted 30-60 minutes, and explored experiences, strategies and behaviours that the participants identify as important to maintaining their new body weight. Interviews were transcribed verbatim and analysed to identity recurring themes.
Results: Participants completed between 1 and 4 sessions of the 3-month program, losing between 6% and 36% of original body weight (mean 19%). At time of interview, weight loss ranged from 4% to 34% (mean 17%). What was learned through TLM continues to inform participants' mindsets and daily practice and is often consolidated as new habits. In addition to learning about nutritious foods, the TLM taught them how to be mindful; how to pay attention to hunger and satiety signals from their body. They take new understandings and practices learned in TLM community forward, including practicing self-compassion and eliminating self-judgement. Maintaining their weight is part of a long-term lifestyle change and most speak of having a new self-concept and identity. They no longer identify as a "dieter" with a negative body image, thinking about what they should/should not eat to avoid weight gain. Their eating patterns are now driven by how food makes them feel, rather than fear of gaining weight. They identify as confident, healthy, active people who take pride and enjoyment in their new understanding of the connection between food and their body. Participants prepare for potentially challenging contexts and set themselves up for success by planning and curating a healthy food environment at home, work, and in social settings, thereby avoiding impulsive eating.
Conclusions: The findings of this study suggest that cognitive, psychological and behavioural factors fostered during a weight loss program can lead to long term lifestyle changes to support weight loss maintenance. Learning about and through a supportive weight loss program encourages new habits, enhanced mindfulness, and leads to changes in self-concept and identity. Self-efficacy and internal motivation to maintain weight loss comes from enhanced knowledge, new habits and feeling better physically, which in turn supports self-confidence and well-being. Findings emphasize the importance of mindset and being able to personalise sustainable healthy eating to suit individual circumstances.

PO4.115

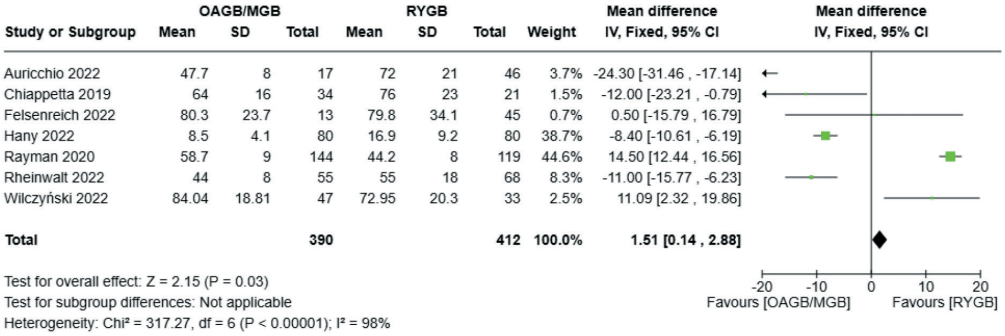
Tailoring revisional bariatric surgery post laparoscopic sleeve gastrectomy: a meta-analysis comparing one anastomosis gastric bypass vs. Roux en Y gastric bypass Outcomes

ISSA, M. T.; Das, K.; Karim, M. A.; Kabir, S. A.; Khan, A.

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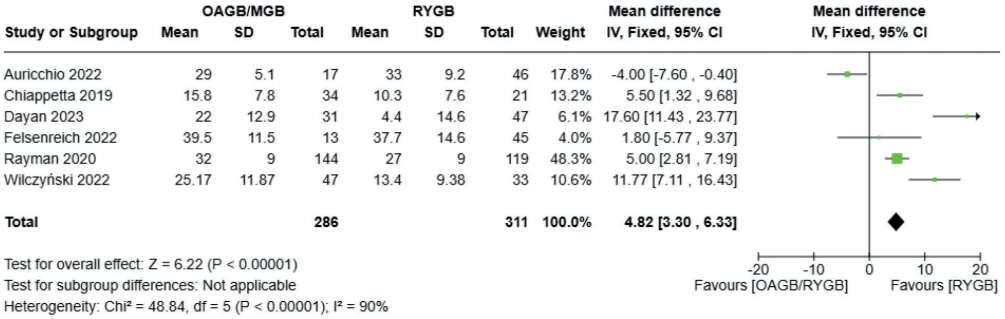
Introduction: Revisional bariatric surgery is increasingly performed after laparoscopic sleeve gastrectomy (SG), with rates being as high as 12% at 10 years post-index procedure. Gastro-oesophageal reflux (GERD) and weight regain (WR) are cited as being the most common indications for revision, however the standard revisional surgical procedure is still debated. In this study, we aimed to analyse the surgical outcome of one anastomosis gastric bypass (OAGB) vs Roux en Y gastric bypass (RYGB) post-SG to standardise the operation of choice based on the revision indication.
Methods: A comprehensive search followed PRISMA guidelines and used different electronic data sources. Studies comparing OAGB with RYGB as revisional bariatric surgery post-SG were included. Studies comparing the outcomes of these surgeries following any other primary bariatric procedure were excluded. Outcomes analysed included % total weight loss (%TWL), % excess weight loss (%EWL), operative time, GERD remission, diabetes remission, and early postoperative complications. Data analysis was performed using Revman 5.3.
Results: Eight eligible studies were included with a total number of 893 patients: 425 in the OAGB group and 468 in the RYGB group. OAGB showed a higher %TWL and %EWL (Odd ratio (OR) 4.82, P< 0.00001) and OR= 1.5, P=0.03, respectively. The remission of GERD was higher in the RYGB group (OR=0.11, P<0.00001), however remission of diabetes favoured the OAGB (OR= 3.15, P=0.005) with shorter operative time in OAGB (OR=-30.11, P<0.00001). De novo GERD was statistically higher with OAGB (OR 19.42 P= 0.006). No significant differences were observed for postoperative leaks, bleeding, hospital stay, or marginal ulcer rates.
Conclusion: Both OAGB and RYGB are safe and effective as revisional bariatric procedures post-SG. OAGB offers advantages in weight loss and diabetes remission, while RYGB is superior in GERD remission and reducing GERD incidence postoperatively. The choice of revisional procedure should be tailored to the patient's indication, emphasising weight loss or GERD management.

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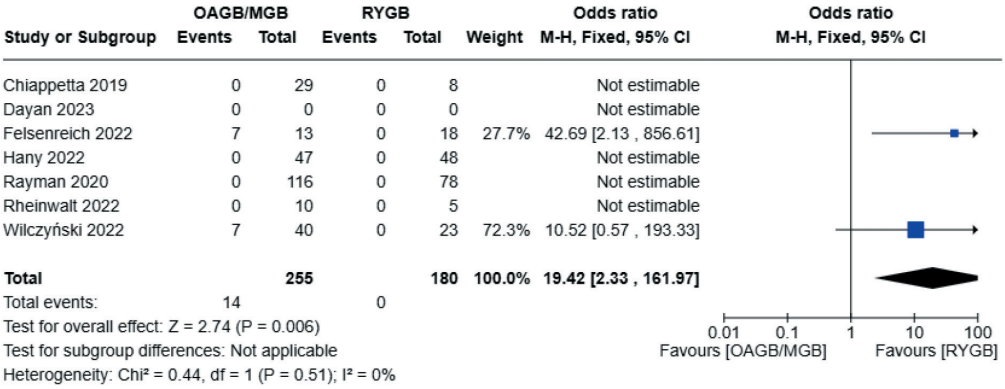
OAGB Group showed a higher %EWL (P< 0.00001 and OR= 1.5, P=0.03) than RYGB Group

Fig. 1. Forst Plot: % of Excess Weight Loss (%EWL).



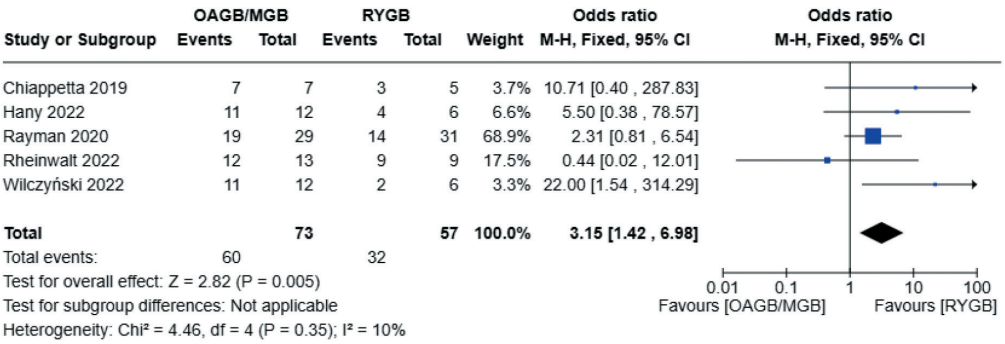
OAGB Group showed a higher %TWL (Odd ratio (OR) 4.82, P< 0.00001) than the RYGB Group

Fig. 2. Forst Plot: % of Total Weight Loss (%TWL).



De novo GERD was statistically higher with OAGB (OR 19.42 P= 0.006)

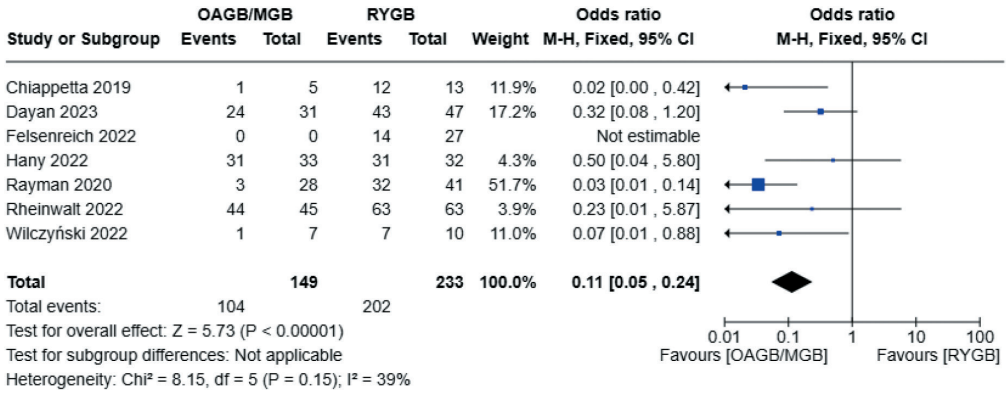
Fig. 3. Forst Plot: Denovo GERD post Revesion.



Remission of diabetes favored the OAGB (OR= 3.15, P=0.005)

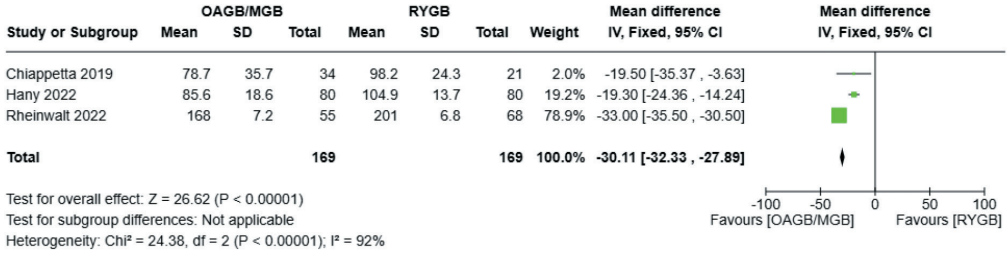
Fig. 4. Forst Plot: Diabetes Remission.

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GERD Remission was higher in the RYGB group (OR=0.11, P<0.00001)

Fig. 5. Forst Plot: GERD Remission.



Shorter operative time in OAGB Group (OR=-30.11, P<0.00001)

Fig. 6. Forst Plot: Operative Time.

Tab. 1. Characteristics of the included studies.

Study	Country	Type of the study	Population	Inclusion and exclusion criteria	Journal	Follow-up (Months)
Chiappetta 2019 [1]	Germany	Prospective (N-RCT)	Total: 55 RYGB: 21 OAGB/MGB: 34	RYGB for GERD post GS OAGB/MGB for Pt with weight regain >15% of their post-operative weight	Obesity Surgery	12
Rayman 2020 [2]	Israel	Retrospective	Total: 263 RYGB: 119 OAGB: 144	Inclusion: Revisional Surgery for GS due to weight regain Exclusion: Revisional surgery for complication, patients who underwent surgery other than OAG or RYGB, patients who refused to participate, patients who lost in follow-up	Obesity Surgery	32
Auricchio 2022 [3]	Italy	Retrospective	Total: 63 RYGB: 46 OAGB: 17	Inclusion: Revisional Surgery (OAG or RYGB) after GS for weight regain or any other complications. Exclusion: primary surgery was not done by the same centre or patient received a primary SG after another bariatric procedure gastric band	Surgeries	12
Felsenreich 2022 [4]	Austria	Retrospective	Total: 79 RYGB: 54 OAGB: 17	Inclusion: Revisional Surgery (OAG or RYGB) after GS for weight regain or any other complications. Exclusion: The patient received a primary SG after another bariatric procedure gastric band	Obesity Surgery	60
Rheinwalt 2022 [5]	Germany	Retrospective	Total: 123 RYGB: 68 OAGB: 55	Inclusion: Revisional Surgery (OAG or RYGB) after GS for weight regain or other complications. Exclusion: The patient received a primary SG after another bariatric procedure, gastric band or unknown cause, lost to follow-up, and AP resection for recurrence of local disease leiomyosarcoma.	World Journal of Surgery	24
Wilczyński 2022 [6]	Poland	Retrospective	Total: 80 RYGB: 33 OAGB: 47	Inclusion: failure or intolerance of LSG treatment for obesity, treated with either RYGB or OAGB.	Journal of Gastrointestinal Surgery	60
Hany 2022 [7]	EGYPT	RCT	Total: 160 RYGB: 80 OAGB: 80	Inclusion: Weight regains after SG during 2 years follow up. (BMI exceed 35) Exclusion: According to the Los Angeles (LA) classification, patients with grade B or higher have GERD.	Obesity Surgery	24
Dayan 2023 [8]	Israel	Retrospective	Total: 78 RYGB: 47 OAGB: 31	Inclusion: SG adult patients with GERD symptoms who underwent conversion to OAGB and RYGB due to GERD with or without weight issues. Exclusion: Mechanical obstruction of GS	Obesity Surgery	32

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Tab. 2. References of the included studies.

Study Number	Study Reference
1	Chiappetta S, Stier C, Scheffel O, Squillante S, Weiner RA. Mini/One Anastomosis Gastric Bypass Versus Roux-en-Y Gastric Bypass as a Second Step Procedure After Sleeve Gastrectomy-a Retrospective Cohort Study. Obes Surg. 2019 Mar;29(3):819-827. doi: 10.1007/s11695-018-03629-y. PMID: 30542828.
2	Rayman S, Assaf D, Azran C, Sroka G, Assalia A, Beglaibter N, Elazary R, Eldar SM, Romano-Zelekha O, Goitein D. Sleeve Gastrectomy Failure-Revision to Laparoscopic One-Anastomosis Gastric Bypass or Roux-n-Y Gastric Bypass: a Multicenter Study. Obes Surg. 2021 Jul;31(7):2927-2934. doi: 10.1007/s11695-021-05334-9. Epub 2021 Mar 25. PMID: 33765292.
3	Auricchio P, Tanay E, Kieninger C et al (2022) Re-do surgery after sleeve gastrectomy: a single center comparison between Roux-en-Y gastric bypass and one anastomosis gastric bypass. Surgeries 3(2):126–133
4	Felsenreich DM, Steinlechner K, Langer FB, Vock N, Eichelter J, Bichler C, Jedamzik J, Mairinger M, Kristo I, Prager G. Outcome of Sleeve Gastrectomy Converted to Roux-en-Y Gastric Bypass and One-Anastomosis Gastric Bypass. Obes Surg. 2022 Mar;32(3):643-651. doi: 10.1007/s11695-021-05866-0. Epub 2022 Jan 14. PMID: 35028871; PMCID: PMC8866292.
5	Rheinwalt KP, Schipper S, Plamper A, Alizai PH, Trebicka J, Brol MJ, Kroh A, Schmitz S, Parmar C, Neumann UP, Ulmer TF. Roux-en-Y Versus One Anastomosis Gastric Bypass as Redo-Operations Following Sleeve Gastrectomy: A Retrospective Study. World J Surg. 2022 Apr;46(4):855-864. doi: 10.1007/s00268-021-06424-6. Epub 2022 Jan 5. PMID: 34985543.
6	Wilczyński M, Spychalski P, Proczko-Stepaniak M, Bigda J, Szymański M, Dobrzycka M, Rostkowska O, Kaska Ł. Comparison of the Long-term Outcomes of RYGB and OAGB as Conversion Procedures After Failed LSG - a Case-Control Study. J Gastrointest Surg. 2022 Nov;26(11):2255-2265. doi: 10.1007/s11605-022-05395-w. Epub 2022 Jul 5. PMID: 35790676; PMCID: PMC9643181.
7	Hany M, Zidan A, Elmongui E, Torensma B. Revisional Roux-en-Y Gastric Bypass Versus Revisional One-Anastomosis Gastric Bypass After Failed Sleeve Gastrectomy: a Randomized Controlled Trial. Obes Surg. 2022 Nov;32(11):3491-3503. doi: 10.1007/s11695-022-06266-8. Epub 2022 Sep 13. PMID: 36098907; PMCID: PMC9469810.
8	Dayan D, Kanani F, Bendayan A, Nizri E, Lahat G, Abu-Abeid A. The Effect of Revisional One Anastomosis Gastric Bypass After Sleeve Gastrectomy on Gastroesophageal Reflux Disease, Compared with Revisional Roux-en-Y Gastric Bypass: Symptoms and Quality of Life Outcomes. Obes Surg. 2023 Jul;33(7):2125-2131. doi: 10.1007/s11695-023-06636-w. Epub 2023 May 11. PMID: 37166738.

PO4.117

Changes in cytokines and fibrotic growth factors after low-carbohydrate or low-fat low-energy diets in females with lipedema

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[7]Nord-Trøndelag Hospital Trust, Clinic of Surgery, Namsos Hospital, Norway, Department of Public Health and Nursing, Faculty of Medicine and Health Sciences, Norwegian University of Science and Technology (NTNU), Trondheim, Norway, Centre for Obesity and Innovation (ObeCe), Clinic of Surgery, St. Olav University Hospital, Trondheim, Norway

Background: Lipedema is considered an inflammatory related disease; and low-carbohydrate ketogenic diets may reduce inflammation. However, no randomized controlled trials have investigated the effect of a low-carbohydrate ketogenic diet on inflammatory markers in females with lipedema.
Objectives: To compare changes in inflammatory and fibrosis associated markers after a low-energy low-carbohydrate (LCD) versus a low-fat diet in females with lipedema, and to explore potential associations between changes in pain and changes in inflammatory and fibrosis associated markers.
Methods: Females with lipedema and obesity were randomized to either a LCD or low-fat diet (both 1200 kcal/day) for 8 weeks. Body composition (fat mass (FM) and fat free mass (FFM)) and the plasma concentrations of high-sensitivity C-reactive protein (hsCRP), cytokines and fibrosis associated markers were measured pre- and post-intervention.
Results: 70 females were included (35/group) (mean age: 47.3±10.9 years, BMI: 36.9±4.9 kg/m^2). Both groups lost weight, and FM (kg and %), with a greater reduction in the LCD group. A reduction in macrophage inflammatory protein (MIP)-1ß, tumor necrosis factor (TNF)-α, and hsCRP was seen in the LCD group only, despite no differences between groups. No associations were found between changes in pain and changes in cytokines and fibrosis associated markers.
Conclusion: Changes in cytokines and fibrosis associated markers did not differ between low-energy LCD and low-fat diets in females with lipedema, despite a beneficial profile in the LCD group. Inflammation does not seem to be involved in pain reduction following LCD in this patient group.

PO4.118

Objective, non-invasive muscle performance measurement to define effective training for person living with obesity

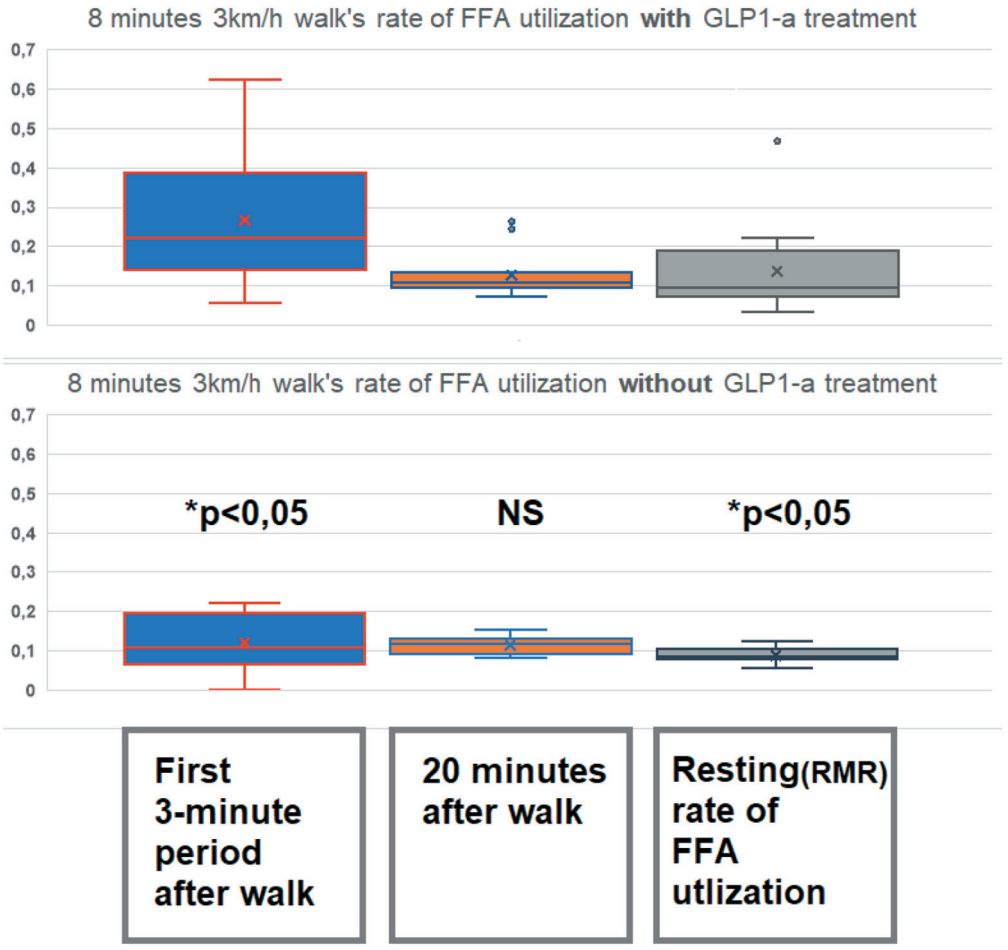
Kurucsai, G.[1]*; Nemeth, H. T.*[1]*; Takacs, P.*[1]*; Kalman, T. Z.*[2]

[1]Department of Weight Management, Dr. Kurucsai Medical Care Centre, Székesfehérvár, Hungary
[2]Laboratory, Medicover Diagnosztikai Központ Zrt., Budapest, Hungary

Introduction: Recommendations suggest a minimum of 300 minutes of physical activity per week, but in clinical practice we treat person living with obesity according to their diet, BMI. The human body stores energy in fat, so it must be restored from fat for muscle activity. In mitochondria, the oxygen demand for energy production from free fatty acids (FFA) is different from

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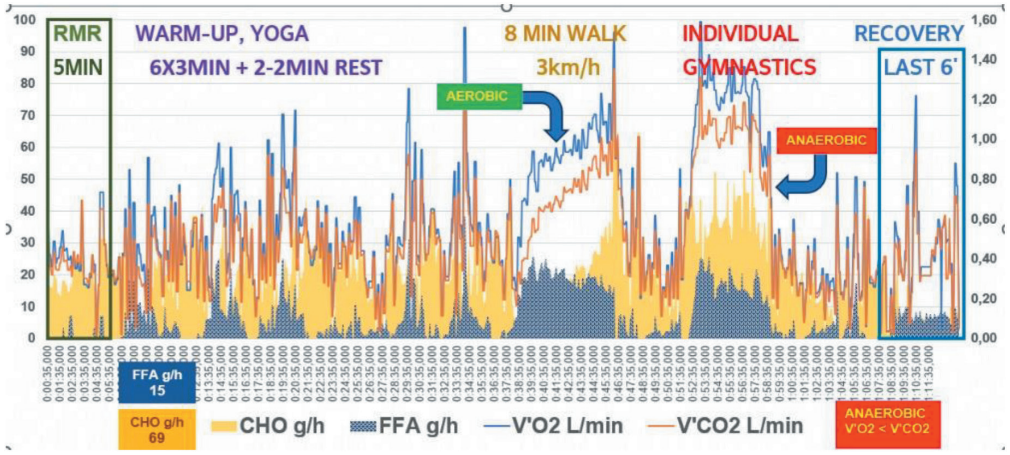
that of carbohydrates (CHO). By adapting the cardiopulmonary exercise test (CPET) with spiroergometry in a metabolic direction to optimise FFA utilization in unsuccessful patients, we formulate a new professional need to determine effective exercise, enhancing results with diet and medication.
Methods: We studied 71 participants with BMI 29.5-42.7 by CPET, forming homogeneous groups. 40 were self-exercising with a tolerable dose of Glp-1a on entering (Group 1) and 31 were doing recumbent bicycle training for at least 150 min per week (Group 2). Their analysed training was thus divided: 5 min resting (RMR), 30 min warm-up, 8 min 3km/h walking, 10-20 min individual gymnastics (until anaerobic functioning), and 20 min recovery. Metabolite logistics (FFA or CHO consumed) and hormonal regulators (insulin, GLP-1) were measured in stages. (Alpco Ltd.ELISA).
Results: RMR FFA utilization in Group 1: 5.4+/-0.8g/h, Group 2: 2.9+/-1.0g/h, p<0.05. During individual gymnastics G1: 37.5+/-9%, G2: 34.2+/-10%, p>0.05,NS; during the 3km/h walk: 55.1+/ 9.5% vs. 38.1+/-11.5% (p<0.001); during the 3-minutes period after walk 43.4+/-10% vs. 27.4+/-14.5%, (p<0.001). During slow walk the average load intensity (in METS) was the same: 1.94+/-0.54 vs 2.16+/-0.62 (p>0.05), during individual gymnastics 3.64+/-0.98 vs 5.67+/-1.55 (p<0.05) MET, but the FFA utilization average was inversely proportional to load: FFA 14.05g vs. 11.9 g/training, CHO 53.1g vs. 64.0 g/training.
GLP-1a treatment had no measurable effect on GLP-1 levels, but recovery insulin levels were 24.0+/-4.5 vs 31+/-6.7 mIU/ml (p<0.05), and resting rate of FFA utilization was also significant in Group1. Percentage of people achieving at-least 3 kg weight loss by the 3-month follow-up: 68 vs. 54%
Conclusions: Results show that low-intensity walking caused an increase in FFA consumption in muscles, which was significantly potentiated by GLP-1a. In addition, higher-intensity individual gymnastics was not more beneficial for Group 2 in terms of FFA consumption. A parallel can be drawn based on the higher insulin average, as it is an anabolic hormone that reduces FFA utilization in muscles, which can occur as a catabolic process under low insulin. Weight loss is therefore controlled by more finely tuned regulators



Increasing the rate of FFA used to produce resting energy helps in weight loss in a 168 hours model. Even everyday activities can improve general endurance. After an 8-minute, 3 km/h, slow walk, the FFA utilization rate, which further rises with medical treatment, also indicates that regular low-intensity movements are preferred to low-efficiency training methods.

Fig. 1. Long-term sustainable resting FFA utilization.

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The figure shows the amount of FFA and CHO used, the oxygen consumed and carbon dioxide produced. The efficiency of movements can be compared based on FFA utilization.The use of FFA during the recovery period affects further usage.

Fig. 2. Presenting FFA or CHO utilization for energy production during performance test per breath.

than has been assumed in practice, and the introduction of a dynamic, objective measurement method is necessary for clinicians, as opposed to the only anthropometric or momentary state (e.g. DEXA, MR, OGTT) methods. This is also justified by the difference in RMR FFA utilization, as we spend most of our lives at rest (RPE scale = 2-3), with an overall load of 1.5-2.0 MET. Nevertheless, the 12-15 g of FFA used per training session grants a weight loss of around 200 g per month, which is inconsistent with the results achieved.

PO4.119

Relationships between Body Mass Index, Hyperphagia, Control of the Food Environment and Residential Setting in Adults with Genetic Obesity Prader-Willi Syndrome

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Introduction: Prader-Willi Syndrome (PWS) is a genetic neurodevelopmental disorder characterized by intellectual disability, hormone deficiencies and hyperphagia. Without rigorous control of the food environment, individuals with PWS face severe obesity with associated complications and risk of early death. Some studies have suggested that specialist PWS residential homes offer the best opportunity to manage hyperphagia and obesity. This study examined the relationships between hyperphagia, control of food environment, body mass index (BMI) and residential setting in adults with PWS.
Methods: Retrospective routine clinical data was examined from adults attending PWS clinic at Hammersmith Hospital, UK, living in the same residence for ≥1 year and not on GLP-1 analogues, using data from multiple visits as available. Hyperphagia was assessed using the Dykens questionnaire (HQ-D) and Hyperphagia Questionnaire for Clinical Trials (HQ-CT). Food Safe Zone (FSZ) questionnaire evaluated control of the food environment e.g. prevalence of locking of kitchen cupboards, supervision, warning others of hyperphagia. Residential setting was categorised as family home (FH), supported living or non-specialist residential home (SL/NSRH), or specialist residential home (SRH). Pearson's correlation assessed relationships between variables, and mixed-effect models compared outcomes by residence type.
Results: 68 adults, 54.4% female, at first/last review: mean ± SD age 24.1 ± 7.4, 27.4 ± 8.4 years, BMI 36.5 ± 11.4, 37.5 ± 12.0 kg/m^2, residence FH 82.4/65.7%, SL/NSRH 10.3/17.9%, SRH 7.4/17.9%. Overall and in FH only, BMI positively correlated with HQ-D (r=0.29-0.34, P<0.005), HQ-CT (r=0.43-0.46, P<0.001) and FSZ (r=0.31-0.34, P<0.04) scores. FSZ scores positively correlated with HQ-D (r=0.52-0.66, P<0.001) and HQ-CT (r=0.48-0.61, P<0.001) scores.
There was a trend toward higher BMI in those living in FH [mean (95% CI) 41.5 (37.0,46.0)] vs. in SL/NSRH [31.1 (20.2,41.9)] and SRH [33.4 (25.0, 41.8)], adjusting for duration in residence and use of psychotropic drugs associated with weight gain (P=0.11-0.13). HQ-CT scores (max 36) were lower in SRH [6.9 (2.1,11.6)] vs. FH [11.7 (9.2,14.2), P=0.066] and SL/NSRH [14.2 (8.7,19.6), P=0.046]. FSZ scores (max 80) were higher in SRH [63.3 (52.6,74.0)] vs. FH [44.4 (38.7,50.2), P=0.002], but not vs. SL/NSRH [54.8 (38.7,70.8), P=0.39].
Conclusions: In adults with PWS, higher BMI was associated with more severe hyperphagia. Stricter control of the food environment appeared to be a response to greater hyperphagia and higher BMI rather than looser control leading to more opportunities for obtaining food and higher BMI. SRH appeared to support better management of obesity and hyperphagia in adults with PWS possibly through stricter control of the food environment. However, due to the cross-sectional design, longitudinal studies and increased samples sizes are needed to validate these findings and clarify causality.

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PO4.120

Association between demographic/anthropometric factors and obesity-related complications and the utility of the Edmonton Obesity Staging System (EOSS)

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Introduction: Obesity is recognized as a chronic disease that can lead to numerous severe complications. This study aims to elucidate the associations between demographic variables, anthropometric measurements, and the complications arising from obesity, with an emphasis on employing the Edmonton Obesity Staging System (EOSS) for stratifying disease severity.

Methods: Data were collected from 168 patients attending an obesity management clinic. Statistical analyses, including t-tests, ANOVA, Fisher's exact test, and multiple regression, were applied to examine the relationships between demographic characteristics (age, sex) and anthropometric parameters [Body Mass Index (BMI) and anthropometric measurements] with obesity-related complications.

Results: Sex was not statistically associated with BMI or EOSS stage, nor were there significant associations between age and BMI. However, age demonstrated a significant association with EOSS stage (p<.001), with older patients more frequently classified in EOSS stages 3 and 4 compared to stages 1 (p=.049) and 2 (p=.002). Patients in EOSS stages 3 and 4, with greater waist circumference (p=.043) and waist-to-height ratio (p=.010), were more likely to have type 2 diabetes mellitus. In contrast, BMI did not show a significant association with diabetes (p=.479).

Age was positively associated with hypertension risk (p=.009), while BMI was associated with dyslipidemia risk (p=.012). Cardiovascular disease was linked to older age (p<.001) and higher waist-to-hip ratio (p=.036). Male sex (p=.023), higher EOSS stage (p=.037), and higher waist-to-hip ratio (p=.013) were associated with increased stroke risk. Obstructive sleep apnea syndrome was more prevalent among patients with higher waist-to-hip ratio (p=.014), waist-to-height ratio (p=.007) and neck circumference (p=.026). Additionally, higher neck circumference (p=.050) and older age (p=.003) were associated with metabolic-associated steatotic liver disease (MASLD).

Anthropometric measurements, such as waist circumference, were significantly associated with older age (p<.001), higher BMI (p<.001) and higher EOSS stage (p=.007). Hip circumference was significantly associated with female sex (p<.001), older age (p=.040) and higher BMI (p<.001). Similarly, waist-to-hip and waist-to-height ratios were strongly associated with older age (p<.001), higher BMI (p=.032), and male sex (p<.001), while neck circumference was associated with male sex (p<.001) and high BMI (p=.001). Lastly, higher upper-arm circumference was noted in younger individuals with higher BMI (p<.001).

Conclusions: The above findings highlight the critical role of demographic and anthropometric parameters as key factors in the management of obesity-related complications. The integration of these factors into clinical practice enhances the precision of risk stratification and the tailoring of therapeutic interventions. The EOSS has been validated as a reliable and individualised framework for evaluating obesity severity, offering significant utility in optimising patient outcomes and guiding targeted management strategies.

Conflict of Interest: None Disclosed

Funding: No funding to report

Tab. 1. BMI Class (N=163).

BMI Class (kg/m^2)	N	Percentage (%)
18.5-24.9/Normal weight	1	0.6
25-29.9/Pre-obesity	7	4.2
30-34.9/Obesity class I	33	20.2
35-39.9/Obesity class II	39	23.9
>40/Obesity class III	83	50.9

Patients categorized according to BMI class

Tab. 2. Description of sample.

	N	Minimum	Maximum	Mean	Std. Deviation
Age	155	13	78	48.51	13.660
Height	163	1.50	1.87	1.6598	.9530
Weight	164	69.1	240	116.362	29.5217
Waist Circumference	158	84	161	117.263	16.2031
Hip Circumference	162	100	182	128.957	15.5202
Waist to Hip Ratio	157	.690	1.19	.9103	.1064
Waist to Height Ratio	161	.491	.990	.7085	.0925
Neck Circumference	162	31	107	42.324	7.3964
Arm Circumference	158	28.5	63.5	41.066	6.584
BMI	163	24.5	74	42.015	9.040

Descriptive statistics

Tab. 3. EOSS (Edmonton Obesity Staging System) (N=150).

EOSS	N	Percentage (%)
Stage 0	1	0.6
Stage 1	3	2
Stage 2	99	66
Stage 3	41	27.3
Stage 4	6	4

Patients categorized according to EOSS

Tab. 4. Sex percentages.

Sex	N	Percentage (%)
Male	66	39.3
Female	102	60.7

Patients attending the obesity clinic & percentages according to sex

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Tab. 5. Pre-Diabetes & Type 2 Diabetes Mellitus (DM2) (N=162).

Pre-Diabetes or Diabetes	N	Percentage (%)
No	67	41.3
Diabetes	83	51.2
Pre-diabetes	12	7.3

Percentages of Pre-Diabetes & DM2 among patients attending the obesity clinic

Tab. 6. Hypertension (N=165).

Hypertension	N	Percentage (%)
No	74	44.8
Yes	91	55.2

Percentage of hypertension among patients attending the obesity clinic

Tab. 7. Dyslipidaemia (N=164)

Dyslipidaemia	N	Percentage (%)
No	53	32.3
Yes	111	67.7

Percentage of dyslipidaemia among patients attending the obesity clinic

Tab. 8. Cardiovascular Disease (CVD) (N=165).

CVD	N	Percentage (%)
No	151	91.5
Yes	14	8.5

Percentage of CVD among patients attending the obesity clinic

Tab. 9. Ischaemic Stroke (N=165).

Ischemic Stroke	N	Percentage (%)
No	161	97.6
Yes	4	2.4

Percentage of ischaemic stroke among patients attending the obesity clinic

Tab. 10. Obstructive Sleep Apnoea (OSA) (N=155).

OSA	N	Percentage (%)
No	36	23.2
Yes	119	76.8

Percentage of OSA among patients attending the obesity clinic

Tab. 11. Metabolic Associated Steatotic Liver Disease (MASLD) (N=160).

MASLD	N	Percentage (%)
No	34	21.2
Yes	126	78.8

Percentage of MASLD among patients attending the obesity clinic

Tab. 12. Age and BMI.

BMI	Correlations	Age
	Pearson Correlation	-.054
	Sig. (2-tailed)	.510
	N	151

No statistically significant association between age and BMI

Tab. 13. Age and Diabetes.

		ANO-VA			
Age	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	619.234	2	309.617	1.761	.176
Within Groups	25849.139	147	175.844		
Total	26468.373	149			

No statistically significant association between Age and Diabetes

Tab. 14. Body Measurements and Diabetes.

			ANOVA			
		Sum of Squares	df	Mean Square	F	Sig.
Waist Circ. 1st Visit	Between Groups	1612.200	2	806.100	3.214	.043
	Within Groups	37621.980	150			
	Total	39234.180	152			
Waist to Height Ratio 1st Visit	Between Groups	.075	2	.038	4.744	.010
	Within Groups	1.211	153	.008		
	Total	1.286	155			

Statistically significant association between waist circumference and diabetes and between waist to height ratio and diabetes.

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Tab. 15. Association between Body Measurements and Stroke (t-test).

Independent Samples Test		Levene's Test for Equality of Variances				Significance				95% Confidence Interval of the Difference	
		F	Sig	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Waist Circ. 1st Visit	Equal variances assumed	.522	.471	-1.303	154	.097	.195	-10.5658	8.1101	-26.5872	5.4556
	Equal variances not assumed			-1.645	3.263	.096	.191	-10.5658	6.4231	-30.1054	8.9738
Waist to Hip Ratio 1st Visit	Equal variances assumed	1.943	.165	-2.526	153	.006	.013	-.1509357	.0597484	-.2689742	-.0328973
	Equal variances not assumed			-5.341	2.401	.011	.022	-.1509357	.0282595	-.2549878	-.0468836
Waist to Height Ratio 1st Visit	Equal variances assumed	.444	.506	-.133	157	.447	.894	-.006174	.046262	-.097550	.085201
	Equal variances not assumed			-.160	3.230	.441	.883	-.006174	.038676	-.124454	.112105

There was a statistically significant association between waist to hip ratio and stroke. Those with higher values in waist to hip ratio were more likely to have had stroke.

Tab. 16. BMI and Diabetes.

		ANOVA			
BMI	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	123.052	2	61.526	.740	.479
Within Groups	12879.391	155	83.093		
Total	13002.443	157			

No statistically significant association between BMI and Diabetes

Tab. 17. FACTORS ASSOCIATED WITH APNOEA COMPLICATION (Binomial logistic regression).

Variables in the Equation								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1a	Sex(1)	-1.110	1.061	1.095	1	.295	.330	.041	2.635
	Age	.050	.027	3.469	1	.063	1.051	.997	1.108
	BMI 1st Visit	-.197	.156	1.594	1	.207	.821	.605	1.115
	Waist Circ. 1st Visit	.105	.100	1.116	1	.291	1.111	.914	1.350
	Hip Circ. 1st Visit	-.063	.083	.587	1	.444	.939	.798	1.104
	Waist to Hip Ratio 1st Visit	-33.524	13.576	6.097	1	.014	.000	.000	.001
	Waist to Height Ratio 1st Visit	40.963	15.193	7.269	1	.007	616367213864465020.000	72070.604	52713383654875340000000000000000.000
	Neck Circ. 1st Visit	.272	.122	4.936	1	.026	1.313	1.033	1.668

Significant associations were found between waist to hip ratio, waist to height ratio, and neck circumference and apnoea, were increasing values in these body measurements were associated with an increased likelihood of exhibiting apnoea. a. Variable(s) entered on step 1: Sex, Age, BMI 1st Visit, Waist Circ. 1st Visit, Hip Circ. 1st Visit, Waist to Hip Ratio 1st Visit, Waist to Height Ratio 1st Visit, Neck Circ. 1st Visit, Arm Circ. 1st Visit.

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Tab. 18. FACTORS ASSOCIATED WITH ARM CIRCUMFERENCE Multiple regression).

			ANOVA a.			
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	3709.445	6	618.241	42.008	<.001 b.
	Residual	1780.772	121	14.717		
	Total	5490.217	127			

Significant associations were found between age and BMI and arm circumference, where younger age and higher BMI were associated with an increased arm circumference. The strongest association was between BMI and arm circumference. a. Dependent Variable: Arm Circ. 1st Visit b. Predictors: (Constant), EOSS Stage 4 vs. Stages 0 & 1, Sex, EOSS Stage 3 vs. Stages 0 & 1, BMI 1st Visit, Age, EOSS Stage 2 vs. Stages 0 & 1

Tab. 19. FACTORS ASSOCIATED WITH CVD COMPLICATION (Binomial logistic regression).

Variables in the Equation		B	S.E.	Wald	df	Sig.
Step 1a	Sex(1)	.001	2.000	.000	1	1.000
	Age	.241	.071	11.444	1	<.001
	BMI 1st Visit	.064	.247	.066	1	.797
	Waist to Hip Ratio 1st Visit	47.388	22.602	4.396	1	.036

The only significant association was found between age and CVD and waist to hip ratio and CVD, were increasing age and waist to hip ratio was associated with an increased likelihood of exhibiting CVD. a. Variable(s) entered on step 1: Sex, Age, BMI 1st Visit, Waist Circ. 1st Visit, Hip Circ. 1st Visit, Waist to Hip Ratio 1st Visit, Waist to Height Ratio 1st Visit, Neck Circ. 1st Visit, Arm Circ. 1st Visit.

Tab. 20. FACTORS ASSOCIATED WITH HYPERTENSION COMPLICATION (Binomial logistic regression).

Variables in the Equation								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1a	Sex(1)	.693	.729	.904	1	.342	1.999	.479	8.339
	Age	.050	.019	6.805	1	.009	1.052	1.013	1.092
	BMI 1st Visit	-.037	.081	.208	1	.648	.963	.821	1.130
	Waist Circ. 1st Visit	.080	.058	1.898	1	.168	1.084	.967	1.215
	Hip Circ. 1st Visit	-.007	.056	.015	1	.901	.993	.891	1.108
	Waist to Hip Ratio 1st Visit	-2.242	8.258	.074	1	.786	.106	.000	1136129.791
	Waist to Height Ratio 1st Visit	3.332	6.670	.250	1	.617	27.997	.000	13331848.362
	Neck Circ. 1st Visit	.048	.056	.738	1	.390	1.049	.940	1.171
	Arm Circ. 1st Visit	-.073	.060	1.500	1	.221	.929	.827	1.045
	Constant	-8.812	7.933	1.234	1	.267	.000		

The only significant association was found between age and hypertension, were increasing age was associated with an increased likelihood of exhibiting hypertension. a. Variable(s) entered on step 1: Sex, Age, BMI 1st Visit, Waist Circ. 1st Visit, Hip Circ. 1st Visit, Waist to Hip Ratio 1st Visit, Waist to Height Ratio 1st Visit, Neck Circ. 1st Visit, Arm Circ. 1st Visit.

Tab. 21. FACTORS ASSOCIATED WITH NAFLD COMPLICATION (Binomial logistic regression).

Variables in the Equation								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1a	Sex(1)	.251	.883	.081	1	.776	1.285	.228	7.257
	Age	.076	.026	8.785	1	.003	1.079	1.026	1.135
	BMI 1st Visit	-.165	.132	1.566	1	.211	.848	.655	1.098
	Waist Circ. 1st Visit	.146	.088	2.776	1	.096	1.157	.975	1.374
	Hip Circ. 1st Visit	-.105	.094	1.230	1	.267	.901	.748	1.084
	Waist to Hip Ratio 1st Visit	-21.676	13.335	2.642	1	.104	.000	.000	86.491
	Waist to Height Ratio 1st Visit	13.726	11.877	1.335	1	.248	914202.713	.000	11775764830064674.000
	Neck Circ. 1st Visit	.197	.101	3.835	1	.050	1.218	1.000	1.484

Significant associations were found between age and neck circumference in MASLD, were increasing age and neck circumference were associated with an increased likelihood of exhibiting MASLD. a. Variable(s) entered on step 1: Sex, Age, BMI 1st Visit, Waist Circ. 1st Visit, Hip Circ. 1st Visit, Waist to Hip Ratio 1st Visit, Waist to Height Ratio 1st Visit, Neck Circ. 1st Visit, Arm Circ. 1st Visit.

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Tab. 22. FACTORS ASSOCIATED WITH NECK CIRCUMFERENCE Multiple regression).

			ANOVA a.			
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	2749.541	6	458.257	12.345	<.001 b.
	Residual	4640.087	125	37.121		
	Total	7389.629	131			

Significant associations were found between sex and BMI and neck circumference, where higher BMI and being male were associated with an increased neck circumference. The strongest association was between sex and neck circumference. a. Dependent Variable: Neck Circ. 1st Visit b. Predictors: (Constant), EOSS Stage 4 vs. Stages 0 & 1, Sex, EOSS Stage 3 vs. Stages 0 & 1, BMI 1st Visit, Age, EOSS Stage 2 vs. Stages 0 & 1

Tab. 23. FACTORS ASSOCIATED WITH WAIST CIRCUMFERENCE (Multiple regression).

Coefficients a.		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
	(Constant)	84.023	6.385		13.159	<.001	71.383	96.663
	Sex	-14.228	1.485	-.431	-9.582	<.001	-17.167	-11.288
	Age	.089	.057	.075	1.557	.122	-.024	.202
	BMI 1st Visit	1.050	.083	.604	12.580	<.001	.885	1.215
	EOSS Stage 2 vs. Stages 0 & 1	5.613	4.677	.169	1.200	.232	-3.645	14.871
	EOSS Stage 3 vs. Stages 0 & 1	11.999	4.971	.345	2.414	.017	2.157	21.840
	EOSS Stage 4 vs. Stages 0 & 1	17.612	6.465	.192	2.724	.007	4.813	30.411

Significant associations were found between age, BMI, EOSS stage 3 vs. EOSS stages 0/1, and EOSS stage 4 vs. EOSS stages 0/1 and waist circumference, where increasing age and BMI and being EOSS stages 3 & 4 vs. EOSS stages 0 &1 were associated with an increased waist circumference. a. Dependent Variable: Waist Circ. 1st Visit

Tab. 24. FACTORS ASSOCIATED WITH WAIST TO HEIGHT RATIO Multiple regression).

			ANOVA a.			
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.709	6	.118	43.726	<.001 b.
	Residua	.338	125	.003		
	Total	1.046	131			

Significant associations were found between sex, age, and BMI and waist to height ratio, where increasing age, higher BMI and being male were associated with an increased waist to height ratio. The strongest association was between BMI and waist to height ratio. a. Dependent Variable: Waist to Height Ratio 1st Visit b. Predictors: (Constant), EOSS Stage 4 vs. Stages 0 & 1, Sex, EOSS Stage 3 vs. Stages 0 & 1, BMI 1st Visit, Age, EOSS Stage 2 vs. Stages 0 & 1

Tab. 25. FACTORS ASSOCIATED WITH WAIST TO HIP RATIO Multiple regression).

			ANOVA a.			
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.690	6	.115	19.075	<.001 b.
	Residual	.730	121	.006		
	Total	1.420	127			

Significant associations were found between sex, age, and BMI and waist to hip ratio, where increasing age, lower BMI and being male were associated with an increased waist to hip ratio. a. Dependent Variable: Waist to Hip Ratio 1st Visit b. Predictors: (Constant), EOSS Stage 4 vs. Stages 0 & 1, Sex, EOSS Stage 3 vs. Stages 0 & 1, BMI 1st Visit, Age, EOSS Stage 2 vs. Stages 0 & 1

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PO4.121

Efficacy of a Digital Health Application (DiGA) in Obesity Management: 6-Months Results from the AMODA Randomized Controlled Trial on Oviva Direkt for Obesity

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Introduction: Oviva Direkt for Obesity is a digital health application (DiGA) reimbursed in German statutory health care. It is a guideline-based, multimodal, app-based intervention supporting adults with obesity to achieve sustainable weight loss. A previous randomized, controlled trial has demonstrated its clinical efficacy at 3 months (1). The AMODA trial evaluated the efficacy of Oviva Direkt for Obesity at 6 months.
Methods: 164 participants with obesity (BMI 30-45 kg/m2) were randomized into an intervention group using Oviva Direkt for Obesity together with usual care or a control group only receiving usual care. Outcomes were assessed at 6 months including weight change (primary endpoint), quality of life (WHOQOL-BREF), and food literacy (SFLQ). Intention-to-treat-data were analyzed using a linear regression model and estimated marginal means.
Results: At 6 months, the intervention group achieved a mean weight loss of 5.29% (SE: 0.73) compared to 1.76% (SE: 0.68) in the control group (difference: -3.53%; $p < 0.001$) with a large effect size (Cohen's $d = 0.80$) (Fig. 1). The intervention group consistently showed greater weight reduction than the control group at all time points, with marginal differences (the difference between the intervention and the control group) increasing over time (Fig. 2). 49% of participants in the intervention group achieved ≥ 5% weight loss, compared to 4.8% in the control group.Quality of life improved significantly in the intervention group ($p = 0.010$, Cohen's $d = 0.40$), particularly in psychological and social domains. Participants in the intervention group also showed significantly greater improvements in food literacy at 12 and 24 weeks compared to controls ($p < 0.001$).
Conclusion: The AMODA trial demonstrates the clinical efficacy of Oviva Direkt for Obesity, facilitating meaningful weight loss, enhancing quality of life, and improving food literacy at 6 months for adults with BMI 30-45 kg/m². These results highlight the potential of digital lifestyle interventions as a valuable, patient-centered tool for obesity management. Follow-up data is being collected to the explore long-term efficacy of Oviva Direkt for Obesity.

Reference

1. K. Gemesi, S. Winkler, S. Schmidt-Tesch, F. Schederecker, H. Hauner, and C.Holzapfel, "Efficacy of an app-based multimodal lifestyle intervention on bodyweight in persons with obesity: results from a randomized controlled trial," Int. J.Obes., pp. 1–9, Nov. 2023, doi: 10.1038/s41366-023-01415-0.

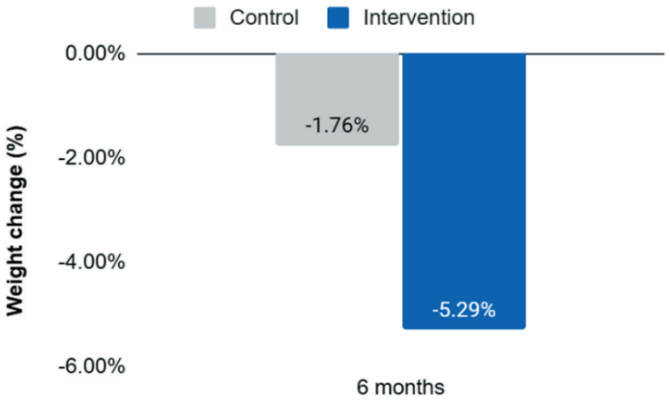


Fig.1. Weight change (%) from baseline to 6 months (i.e. 24 weeks) (primary endpoint).

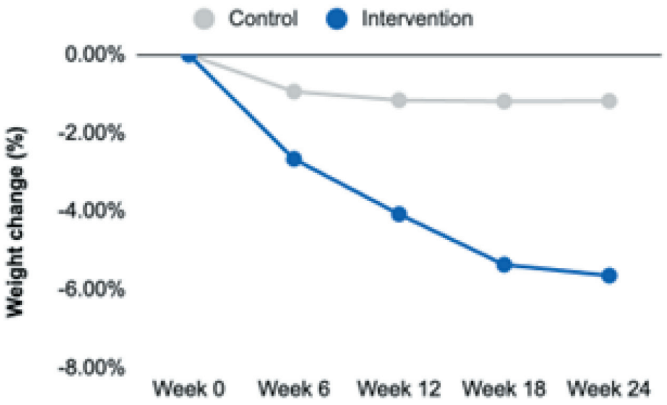


Fig. 2. Weight change (%) over time. Estimated marginal means (EMMs) for percent change in body weight over time in the intention-to-treat (ITT) population (exploratory endpoint).

PO4.122

Psychological Risk Factors and Referral for Bariatric Surgery

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Introduction: Bariatric surgery (BS) is a safe and effective treatment for complex obesity, however known behavioural and psychological risk factors such as untreated alcohol use disorder, eating disorders and trauma history are associated with poorer adjustment and weight outcomes. Multidisciplinary team (MDT) assessment in advance of referral for bariatric surgery is recommended1. Early identification of risk factors allows time for appropriate interventions to support patients to safely proceed to BS.
Aims: To report the occurrence and clustering of psychological risk factors in a cohort seeking BS in a Centre for Obesity Management (COM) in Ireland, and to explore associations between risk factors and BS referral.
Methods: A retrospective audit of data collected at baseline, and a monthly MDT meeting where referral for surgery is decided. Patients' interest in BS is established during Level 3 MDT intervention, and decision to refer or not is based on comprehensive medical and psychological assessment, and engagement with MDT treatment. Psychological assessment includes patient-completed Alcohol Use Disorders Identification Test (AUDIT), Binge eating disorder (BED) questionnaire, Adverse Childhood Experiences (ACE) questionnaire, Depression, Anxiety and Stress short form questionnaire (SF-DAS), Emotional Eating Scale (EES) and Night Eating Questionnaire.
Results: Following MDT discussion, 78% (n=87/111) were referred for BS. At baseline, depression, anxiety and stress (moderate/ severe/ extremely severe) were identified in about half of patients (Depression: 21% (n=23) / 14% (n=16) / 16% (n=18), Anxiety: 15% (n=17) / 9% (n=10) / 27% (n=30), Stress: 15% (n=17) / 20% (n=22) / 7% (n=8)). AUDIT score above 7, indicated increased risk in 13% (n=14), and BED was identified in 14% (n=16). ACE score of 4 or above was identified in 16% (n=18), and 15.3% (n=17) were identified as 'emotional eaters'. Co-occurrence of risk was common with almost a quarter (24.3%) of patients experiencing 4 or more risk factors.
No significant difference was noted in mean number of risk factors (p=0.43, 2.46±2.0 vs 2.1±1.8), nor in DAS (Depression: p=0.31, 8.83±5.6 vs 7.31±5.6, Anxiety: p=0.27, 7.96±6.6 vs 6.36±4.6, Stress: p=0.32 9.54±5.8 vs 8.23±4.7) or AUDIT (p=0.3, 3.44±2.9 vs 4.12±4.8) scores between those not referred and those referred, and more of those referred had a history of BED (10.8% vs 3.6%). Data was analysed using MSExcel2016.
Conclusion: Those with complex obesity may also experience significant psychological burden, which can be a barrier to accessing treatment, and to gaining optimal treatment outcomes. Exploring psychological

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challenges may be viewed as health care professionals 'gate keeping' access to BS, but this study shows that identification of multiple risk factors was not associated with reduced odds of referral for BS. Instead it allows for appropriate treatment plans to be implemented, supporting timely and safer BS referral.

Reference

1. ASOI Adult Obesity Clinical Practice Guideline adaptation (ASOI version 1, 2022): Bariatric Surgery: Selection & Pre-Operative Workup.

PO4.123

Increased risk of hepatic steatosis in young adults treated for first-episode psychosis; a retrospective study

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Introduction: Psychotic disorders in young adults are associated with an increased risk of cardiometabolic complications, to which exposure to antipsychotics contributes.[1–2] However, little is known about the evolution of liver health in these young adults. We aim to describe the risk of hepatic steatosis over time in young adults followed in a first-episode psychosis program (FEPP).

Methods: This retrospective study included 170 young adults followed in a FEPP. Clinical parameters [waist circumference, body mass index (BMI), medication, socio-demographic factors, etc.] and biochemical parameters (lipid profile, blood glucose, hemoglobin A1c, liver function markers, etc.) were measured on admission to the FEPP and during follow-up. Based on the estimated results of the Fatty Liver Index (FLI) – a validated predictive score for hepatic steatosis – young adults were individually classified over time as being at low (<30), moderate (30-59) or high (>60) risk of hepatic steatosis.

Results: On admission, the cohort (35% female, mean age 25 ± 5 years) had a BMI of 23.0 ± 6.1 kg/m2 and a mean FLI of 16 ± 15. On average, at 24 months follow-up, the FLI score increased of 19 ± 3. 23% of the young adults developed à FLI > 60 during follow-ups. This deterioration was not detectable by liver enzyme monitoring, but was associated with an increase in anthropometric parameters (weight, waist circumference and BMI). Longer exposition to aripiprazole and paliperidone was associated with an increased FLI.

Conclusion: Nearly a quarter of young adults admitted in a FEPP developed a FLI score > 60, suggesting hepatic steatosis. These findings highlight a progressive increase in the risk of hepatic steatosis in young people experiencing a first psychotic episode, potentially linked to the cardiometabolic deterioration following the introduction of psychiatric pharmacotherapy. Regular monitoring of liver enzymes and FLI would be recommended for young adults admitted for a first episode of psychosis and starting antipsychotics. Better understanding of the hepatic risks associated with antipsychotics and of the psychotic disorder itself is essential to minimize possible hepatic complications in young people experiencing a first episode of psychosis.

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2. Azfr Ali, R. et al. Cardiometabolic screening and monitoring in patients prescribed antipsychotic drugs in primary care: A population-based cohort study. Comprehensive Psychiatry 127, 152419 (2023).

Conflict of Interest: None Disclosed

Funding: No funding to report

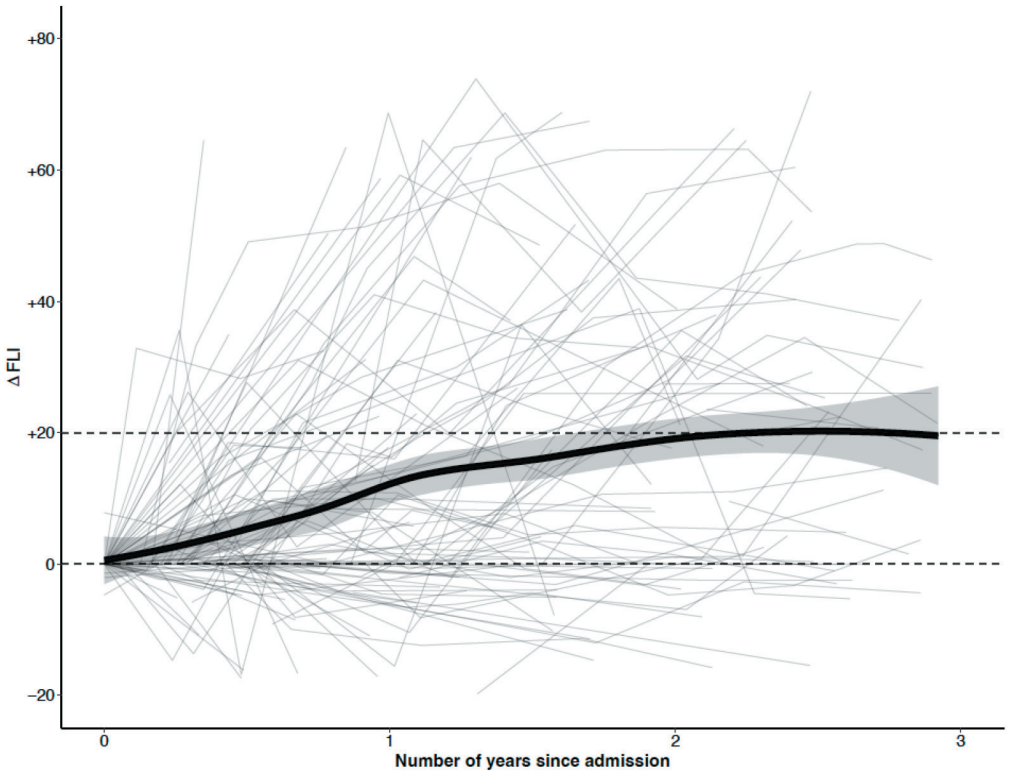


Fig. 1. Evolution of the FLI difference from baseline across time.

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PO4.124

AMOS2: Five-Year Outcomes After Bariatric surgery or Intensive Treatment in Adolescents with Severe Obesity – a Randomized Clinical Trial

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Introduction: Metabolic and bariatric surgery (MBS) has proven to be an effective treatment for obesity and co-morbidities in adolescents with severe obesity. However, data from randomized controlled studies beyond two years are lacking.
Methods: In a multicenter study, 50 adolescents 13-16 years with a BMI ≥35 kg/m2, who had been in conservative treatment for ≥ 1 year were randomized to MBS (early MBS group) or intensive non-surgical treatment starting with an 8-week low calorie diet. Participants randomized to non-surgical intensive treatment were informed that they could be evaluated for MBS again after the two-year follow-up, but that they could crossover earlier if the steering committee found it warranted due to medical reasons or if they turned 18 and could request MBS as routine care.
Results: From August 2014 to June 2017, 50 adolescents (74% girls) aged 15.8 (± 0.9) with a mean BMI of 42.6 (±5.4) were included and randomized (25:25). Before the five-year follow-up,18 (72%) participants randomized to the non-surgical group had undergone MBS (late MBS group). The mean time from inclusion to MBS for the late group was 2.5 years. With adjustment for baseline values, no significant difference was found between early vs. late MBS groups at five years for BMI (-2.4 [95% CI: -6.4 to 1.6]; p=0.240), body weight (-7.2 [95% CI: -18.5 to 4.2]; p=0.217), glucose (0.0 [95% CI: -0.6 to 0.7]; p=0.967), insulin (-5.1 [95% CI: -19.8 to 9.5]; p=0.493), and HDL (-0.1 [95% CI: -0.3 to 0.2]; p=0.562) and LDL cholesterol (-0.2 [95% CI: -0.7 to 0.3]; p=0.446). Adverse events were few.
Conclusions: Adolescents (13-16y) with severe obesity randomized to MBS had a substantial and sustained weight loss over five years. Most adolescents randomized to intensive non-surgical treatment subsequently underwent MBS and achieved similar outcomes as the originally operated group suggesting neither inferiority nor superiority with early vs. late MBS during adolescence.

Conflict of Interest: KJ and TO report educational activities for NovoNordisk and Johnson&Johnson. TO also reports advisory board for Vivus. All reimbursement to their institutions.
JD reports educational activities for Nestlé.
All reported activities were outside the submitted work. No other disclosures were reported.

Funding: Research relating to this abstract was funded by VINNOVA (Swedish Innovation Agency), VR (Swedish Research Council) and Joanna Cocozza Foundation

PO4.125

Early Weight Loss Response as Predictor of Long-Term Weight Reduction in the SURMOUNT-1 Trial

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Introduction: Early weight loss response to obesity management medication or bariatric surgery has been reported as a useful indicator to predict overall response to obesity treatment. Treatment with tirzepatide (TZP), a once weekly GIP/GLP-1 receptor agonist, led to substantial body weight reduction (16.0-22.5%) compared to placebo in participants with obesity or overweight in SURMOUNT-1. Body weight reduction of 15% or greater may be needed for maximal benefit in individuals with obesity-related complications. The objective of this post hoc analysis was to assess whether early weight loss was predictive of long-term body weight reduction in participants treated with TZP in SURMOUNT-1.
Methods: Post hoc analyses included 1544 TZP-treated participants with obesity (BMI ≥30 kg/m^2) or overweight (BMI ≥27 kg/m^2) with at least one weight-related complication excluding type 2 diabetes who had baseline and on-treatment Week 72 body weight measurements. Participants were categorized as either early responders (≥5% weight reduction at Week 8) or non-early responders (<5% weight reduction at Week 8). Comparison of baseline characteristics was based on ANOVA model for continuous data and on Chi-square test for categorical data. Percent change in body weight from baseline to Week 72 was estimated using a mixed model for repeated measurements analysis. Measures (sensitivity, specificity, positive and negative predictive values) were calculated for predicting Week 72 status (≥15% weight reduction or not) based on Week 8 response (≥5% weight reduction or not).
Results: Early responders (n=967, 62.6%) vs non-early responders (n=577, 37.4%) were more likely to be female (70.0% vs 62.4%) and had lower mean body weight (102.3 vs 108.9 kg), mean BMI (37.2 vs 39.2 kg/m^2), and mean waist circumference (112.6 vs 116.6 cm) at baseline. Early responders achieved a significantly greater percent body weight reduction compared to non-early responders from baseline to Week 8 (-7.9% vs. -3.1%, p<0.001) and from baseline to Week 72 (-23.6% vs. -15.1%, p<0.001).
At Week 72, 80.7% of early responders and 48.4% of non-early responders achieved ≥15% body weight reduction (Figure). Being an early responder at Week 8 was highly predictive (positive predictive value: 80.7%) of achieving the weight reduction target of ≥15%, whereas being a non-early responder at Week 8 had limited predictive value (negative predictive value, i.e., chance of not achieving ≥15% body weight reduction: 51.7%). Early response to TZP predicted the body weight reduction at Week 72 with a sensitivity of 0.74 (95% CI, 0.71 to 0.76) and a specificity of 0.61 (95% CI, 0.57 to 0.66).
Conclusion: In this post hoc analysis of the SURMOUNT-1 trial, 68.6% of TZP-treated participants had a ≥15% weight reduction at Week 72, regardless of early weight reduction response category. Furthermore, the early responder group achieved greater reductions in body weight and had higher proportions of participants achieving the weight reduction target of ≥15% compared to non-early responders. Achieving ≥5% body weight reduction at Week 8 was associated with high likelihood of achieving ≥15% body weight reduction at Week 72.

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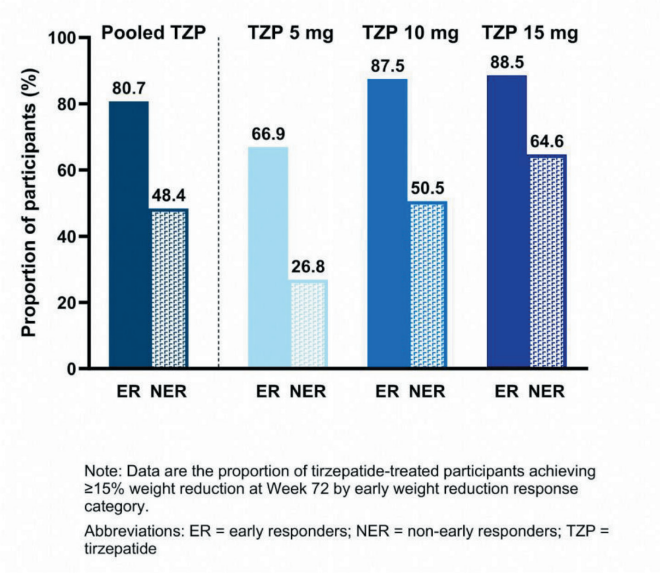


Fig. 1. Proportion Achieving ≥15% Body Weight Reduction Target.

PO4.126

Investigating food temperature choices after acute cold exposure in individuals with overweight or obesity

Beauregard, N.[1]; *Mcinnis, K.*[1]; *Hintze, L. J.*[1]; *Larocque, A.*[1]; *Haman, F.*[1]; *Thivel, D.*[2]; *Doucet, É.*[1]

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[2]Laboratory of the Metabolic Adaptations to Exercise under Physiological and Pathological Conditions (AME2P), Clermond Auvergne University, Clermont-Ferrand, France

Introduction: Food choices are influenced by physiological, emotional, and environmental factors, all of which can be influenced by cold exposure (CE). CE has been shown to increase energy expenditure and affect physiological states, yet its impact on temperature-based food preferences in individuals living with overweight or obesity remains underexplored. This study examines whether 90 minutes of CE alters food choices categorized by temperature in individuals living with overweight or obesity.
Methods: Participants (n=47, 18 males, 29 females) with overweight or obesity (BMI: 33.2±3.9 and 33.7±4.4 kg/m2, respectively) underwent two sessions exposed to either 90 minutes of CE (10°C) via a liquid-conditioned suit or ambient control (22°C). Skin temperature (thermocouples), thermal comfort/sensation (likert scales), energy expenditure and energy intake (EI) were assessed. Participants consumed foods selected from a validated menu served ad libitum after exposure.
Results: CE significantly increased EI coming from hot foods (p=0.025), but not from neutral/cold foods (p=0.953). CE had no significant impact on macronutrient composition. Sex was included as a between-subject factor. While males consumed more calories overall than females (p<0.01), there was no significant difference between men and women in the change in hot food consumption between the control and CE sessions (p=0.286). No correlations were found between EI from hot foods and indicators of cold response, i.e. skin temperature at 90 minutes of CE, thermal comfort and sensation and energy expenditure during CE.
Discussion: These results support the hypothesis that CE increases energy intake from hot foods but does not alter the macronutrient composition of the meal, possibly as a strategy to mitigate heat loss.

Conflict of Interest: None disclosed

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PO4.127

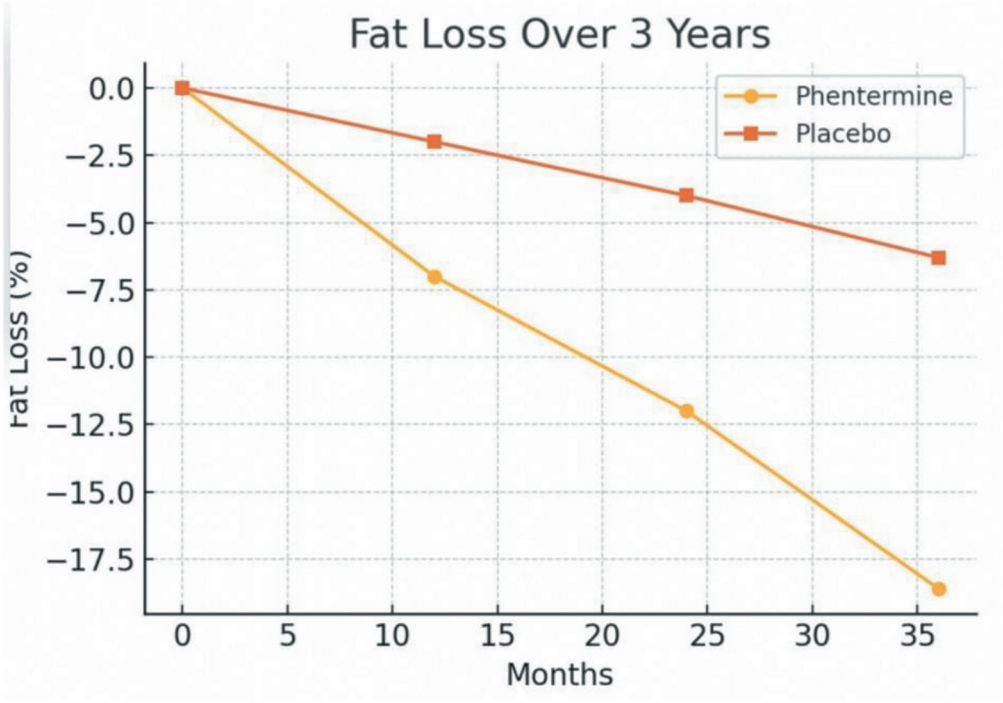
Phentermine in the Modern Era of Obesity Pharmacotherapy. Does It Still Have a Role in Treatment?

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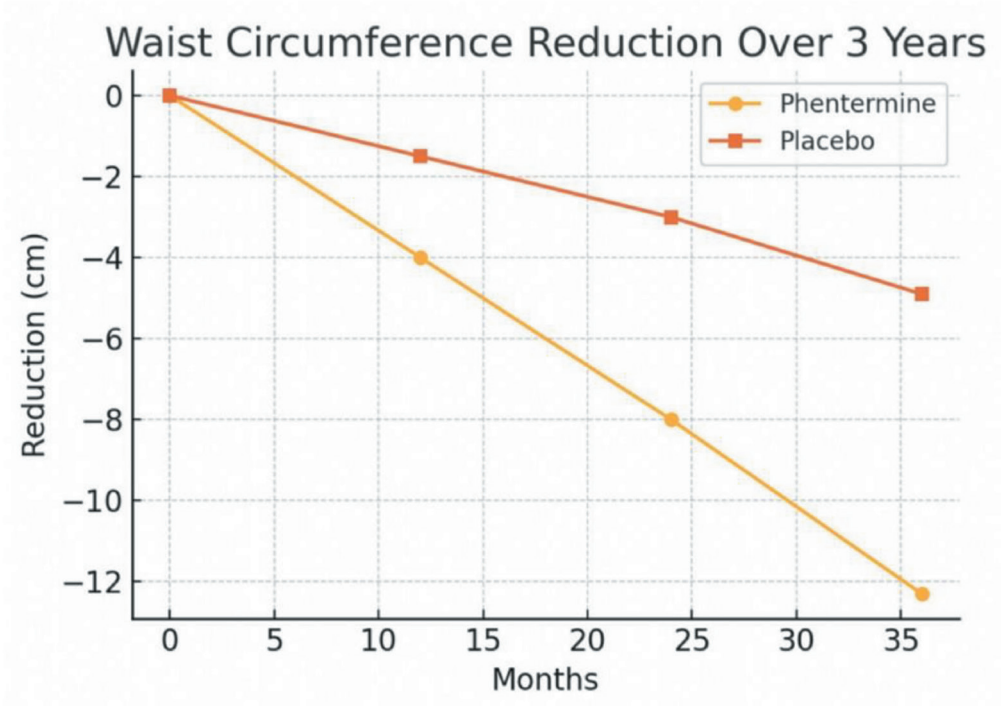
Introduction: Obesity remains a global health crisis, necessitating effective pharmaco therapeutic strategies. Phentermine, approved in 1959, has demonstrated efficacy as a short-term appetite suppressant but has faced scrutiny for its cardiovascular side effects. This study investigates its long-term impact on fat loss, visceral fat loos, muscle regain, body composition, blood pressure and psychological satisfaction, utilizing modern evaluation tools.
Methods: A randomized, double-blind, placebo-controlled design was implemented in a Latin American population aged 21–60 years, with a BMI between 26 and 40 Kg/m2. Both groups with 300 participants (150 in each group). The intervention group received 30 mg of phentermine daily,a hypo-caloric diet (500 kcal/day deficit), and supervised physical activity (150 minutes/week of moderate exercise). The control group followed the same lifestyle program without phentermine. Bioelectrical Impedance Analysis (BIA) and 3D body scanning were used to track changes. Measurements were taken bi-monthly over 3 years. Satisfaction levels were assessed using 5-point Likert scale.
Results: Fat Loss Over Time
The phentermine group demonstrated significantly greater fat loss compared to the placebo group, with an average reduction of 18.6% after 3 years versus 6.3% in the placebo group. Figure 1
Waist Circumference Reduction
Phentermine produced consistent reductions in waist circumference, with an average decrease of 12.3 cm versus 4.9 cm in the placebo group. Figure 2
Satisfaction Levels
Satisfaction levels improved significantly in the phentermine group, correlating strongly with reductions in fat mass and circumference. (Pearson r =0.082, p < 0.001). Figure 3
Visceral Fat Loss
Participants in the phentermine group experienced a remarkable reduction in visceral fat, averaging a 20% decrease compared to a 5% reduction in the placebo group over 3 years. Figure 4
Muscle Gain
Both groups experienced muscle gain, with the phentermine group showing a significantly higher increase of 3.5 kg compared to 1.3 kg in the placebo group. Figure 5
Blood Pressure
Phentermine group:
Systolic Blood Pressure (SBP) increased by 3–5 mmHg over the first year, stabilizing in years 2 and 3.Diastolic Blood Pressure (DBP) increased by 2 mmHg without clinical significance. A 9% of the phentermine group required antihypertensive medication adjustments due to increased blood pressure. No major cardiovascular events occurred in either group.
Discussion: Phentermine demonstrates robust efficacy in achieving meaningful fat loss and waist-hip circumference reductions, accompanied by improved psychological satisfaction. These findings underscore the importance of visible physical changes in promoting patient engagement. The modest increase in systolic blood pressure warrants caution but is a manageable with proper monitoring.
Conclusion: This study reaffirms phentermine's role in modern obesity pharmacotherapy. When combined with regular monitoring, its benefits in fat loss and psychological satisfaction far outweigh potential cardiovascular risks, offering a comprehensive approach to obesity management.

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A mixed-effects model showed time and group effects as significant predictors. Waist Circumference Reduction Phentermine produced consistent reductions in waist circumference, with an average

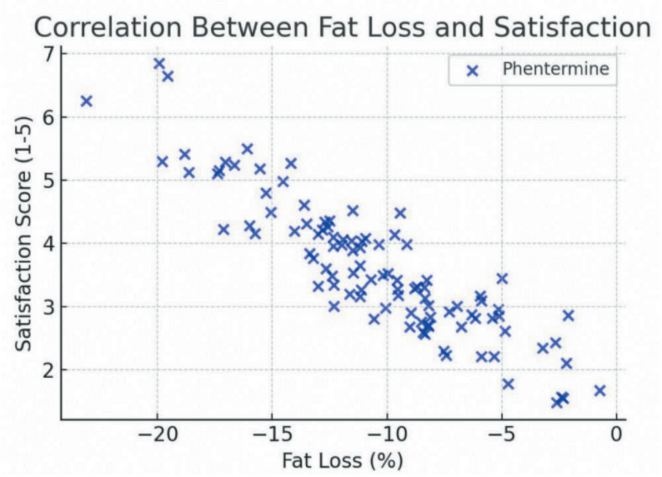
Fig. 1.



Post-hoc analysis revealed significant differences at all time points

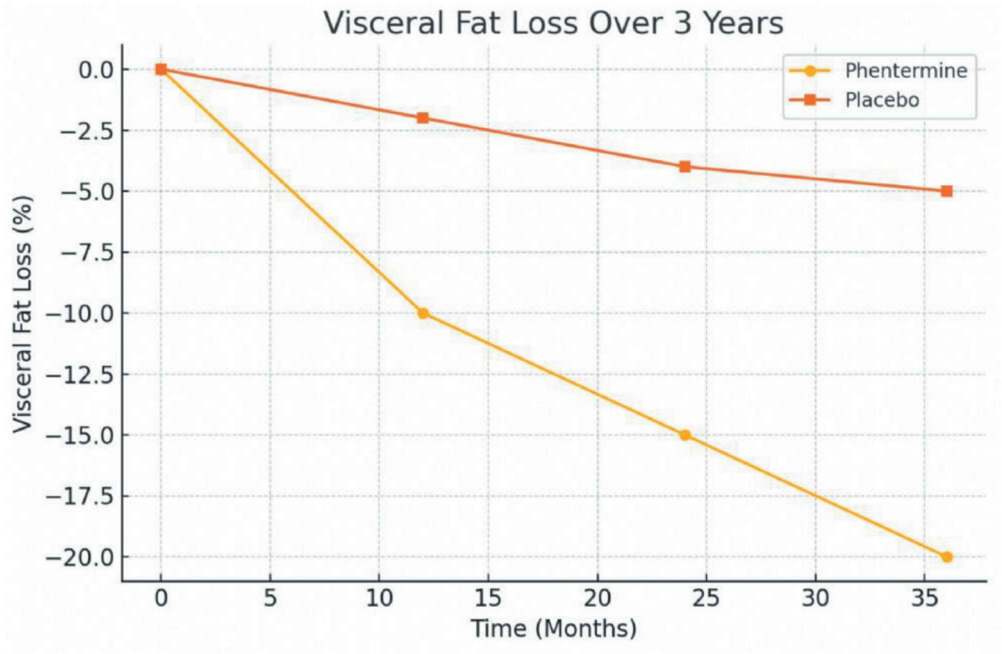
Fig. 2.

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Mediation analysis indicated that fat mass reduction significantly mediated the relationship between treatment and satisfaction

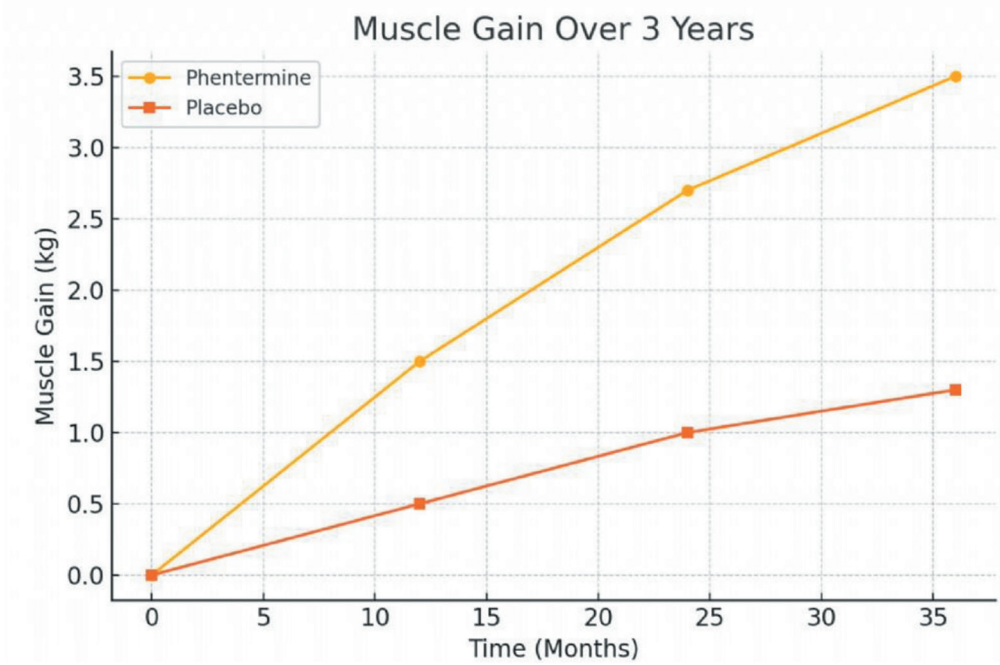
Fig. 3.



This underscores phentermine's efficacy in addressing central adiposity.

Fig. 4.

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Muscle gain trends over 3 years.

Fig. 5.

PO4.128

Study of the relationship between VFR and % body fat in healthy women and women with mental illness

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Introduction: Excess weight is a real health problem that affects the entire body. Overweight and Obesity are among the leading reasons for visiting a dietitian by healthy women. Obesity is also a serious risk factor in people with chronic mental illnesses. Regardless of the excess of body fat, the distribution of fat in the body is also important for cardio-metabolic risk and quality of life. The most unfavorable for health is the priority accumulation of fat around the internal organs (visceral obesity).

Methods: The study included two groups of women:

1. 59 women diagnosed with psychosis (schizophrenia), undergoing treatment with antipsychotics, aged 20-60 years
2. 109 women aged 20-60 years, who visited the dietitian's office to prepare a nutritional plan in connection with being overweight. The women had no registered severe mental illnesses, of the physical illnesses, Hashimoto's thyroiditis was registered in 10%, for which treatment was being carried out.

The anthropometric status of both groups was assessed using different tools: BMI, % body fat and visceral fat, measured with BIA (Biolectric Impedance Analysis) – professional type "Tanita". The data were entered and processed with the statistical package IBM SPSS Ver.26.0. Statistically significant differences were accepted at $p<0.05$.

Results: In group 1 -31% of women were of normal weight, and 69% were overweight or obese. In group 2, an average BMI value of 35.kg/m2 was established with a standard deviation of 6.86, which indicates that all women from group 2 were overweight or obese. In group 2, 75.2% of women had varying degrees of obesity, 24.8% were overweight. 71.2% of group 1 and 96.3% of group 2 had excess fat. At the same time, 12% of group 1 and 20.2% of women in group 2 had excess visceral fat, and only 10% of women in group 1 and 19.3% of women in group 2 were in the gray zone. In total, for both groups, 70% of women had normal VFR values, and 30% were in the gray zone or excess VFR.

Figure 1 shows a comparison of the information from the indicators: VFR and %M3 in the studied individuals. When comparing the data from the norms of the indicators: VFR and M3%, no statistically significant correlation is observed (Spearman's rho=0.153; p=0.113).

The results of the study show a statistically significant strong correlation between the norms for BMI and VFR (Fig. 2) in the studied patients (Spearman's rho=0.778; $p<0.001$). In both studied groups, it was found that with increasing obesity, deviations in the VFR indicator also increase, expressed mostly in obesity grade 3.

Conclusion: Only 30% of women with obesity in our study have borderline or abnormal values of visceral fat, regardless of mental status and medication with antipsychotics in both groups. It is probable that the distribution of fat and, accordingly, the cardio-metabolic risk in women are under the influence of other modifying factors. Among them, estrogen is supposedly the strongest. This hormone plays an important role in energy homeostasis throughout the life cycle (incl. during growth, reproduction and aging of women) and demonstrates protective effects on the distribution of fat in the body.

PO4.129

Consensus on the need for, and design of a clinical trial investigating weight loss intervention to prevent cancer

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Introduction: As the prevalence of obesity continues to rise worldwide and the burden of obesity-related cancer increases in parallel, there is a need to have evidence-based strategies for the prevention of these cancers. Current evidence to inform clinical management and policy is limited but

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a large-scale clinical trial would be influential in unveiling the impact of weight loss intervention on obesity-related cancer. However, a trial of this nature will be complex, lengthy and with associated high costs; therefore we undertake an International expert consensus to inform the need for and design of such a trial.

Methods: The consensus was formed as a 4-step process with the aim of achieving consensus on: (a) the need for a clinical trial for weight loss intervention and cancer prevention, (b) clinical trial design and (c) future research priorities.

Firstly, International, multi-disciplinary researchers were invited to create an expert panel from networks in the European Association for the Study for Obesity (EASO), International Federation for the Surgery of Obesity and metabolic disorders (IFSO), America and Australia. Secondly, a nominal group meeting and PPIE group informed the statements covered in a Delphi consensus. The Delphi consensus was held remotely over 3 rounds with feedback incorporated at each stage, with adjustment and addition of statements where required. A final nominal group meeting was held, following exploration of the Delphi results with a second PPIE group, to discuss borderline statements and elements that did not reach consensus.

Results: 54 expert multi-disciplinary researchers from 12 countries participated in the process. Retention through the Delphi round 1, 2 and 3 was good (98%, 85%, 88%). After 3 rounds, 37 statements were presented; 25 reached consensus, 5 were removed after feedback and 8 did not reach consensus. In the final nominal group meeting, 4 borderline statements were re-discussed and voted on and 2 new statements were generated from the remaining statements and areas that did not reach consensus. Both reached consensus to create 27 statements. Key agreement was reached on:

1. There is a need for clinical trial evidence to inform clinical management in cancer prevention, for people with obesity
2. A clinical trial in this context should assess effects on a population with a generic high cancer risk but that is generalisable to a broad UK/EU population
3. A clinical trial should assess a single specific intervention on cancer risk and that GLP-1/dual agonists are a priority
4. Further research priorities include understanding mechanistic pathways linking weight loss intervention to cancer prevention and identifying cancer pre-cursors

Conclusion: This consensus informs future research of the effects of weight loss intervention for obesity-related cancer prevention. As part of the PADRAIC project (www.PADRAICresearch.com), findings will be used to inform the design of In-Silico trials in this context and future economic modelling. These data will inform a potential real-world trial.

Conflict of Interest: None

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PO4.130

Adipose tissue dysfunction as a key factor of metabolic complications in young women with obesity

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Introduction: Adipose tissue dysfunction is a critical concern, as it extends beyond simple fat storage to involve endocrine and metabolic disruptions. Impaired adipose tissue function leads to an imbalance in the secretion of adipokines and inflammatory cytokines, which play essential roles in metabolism and systemic health. These imbalances can contribute to insulin resistance, chronic inflammation, and an increased risk of developing metabolic syndrome and cardiovascular diseases. In this study we aimed to assess the relationship between the adiponectin/leptin ratio (A/LR) and insulin resistance parameters in young women with obesity.

Materials-Methods: 126 women with an average age of 31.4 ± 6.9 years were included in this study. Blood samples were collected to analyze serum concentrations of leptin, adiponectin, insulin and glucose. Insulin resistance was estimated using the Homeostasis Model Assessment of Insulin Resistance (HOMA-IR), derived from fasting glucose and insulin levels. The A/LR was also calculated and analyzed.

Results: The women included in the study were divided into two groups: 66 with obesity (BMI ≥ 30 kg/m2) and 60 with normal weight (BMI ≤ 25 kg/m2). Compared to women with normal weight, women with obesity had significantly higher leptin levels (30.2 ± 19.3 vs. 10.7 ± 6.3 ng/mL, p<0.001), HOMA-IR, fasting blood glucose, and fasting insulin levels. In contrast, adiponectin levels (12.5 ± 9.1 vs. 28.2 ± 14.8 ng/mL, p<0.001) and the A/LR (0.5 ± 0.49 vs. 3.7 ± 3.7, p<0.001) were significantly lower in women with obesity. An inverse association was found between the adiponectin/leptin ratio and body mass index, central adiposity, fasting blood glucose, insulin levels, and HOMA-IR.

Conclusion: The adiponectin/leptin ratio is a sensitive marker of insulin resistance and adipose tissue dysfunction in young women with obesity.

PO4.131

The role of metabolite logistics and by-product elimination in weight reduction

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Introduction: By adapting spiroergometry (CPET) in a metabolic direction, the biochemical function of muscles can be measured in real-time, i.e. if energy production happens from free fatty acids (FFA) or carbohydrates (CHO). The dynamic changes in venous blood gas and insulin show the importance of by-product elimination. The difference in consumed $V'O_2$ (L/min) and produced $V'CO_2$ (L/min) shows if exercise conditions are aerobic or anaerobic.

Methods: 77 participants were examined by CPET (Group OB), BMI 30+, and 56 active athletes (Group A, 41 participants) as controls, including 15 (Group A-OB) with BMI 30+, members of the EFL American football team. Their training was divided into 20 min warm-up, 30 min individual gymnastics, 15 min individual intensive training for athletes and 20 min recovery. We measured the rate of metabolite logistics (FFA or CHO) for energy expenditure per breath. Oxygen distribution at the muscle level, and by-products, insulin, adiponectin, were also measured in stages.

Results: Rate of FFA utilization for energy production, total measurement: OB=35.1+/-9.4%, A=36.7+/-7.49%, A-OB=20.54+/-4.9%.

During high intensity training, FFA rate A=19.36+/-9.98%, A-OB=3.68+/-1.83%, p<0.001, workload (in METS): A=6.84+/-1.31, A-OB=7.43+/-1.06 (NS).

Warm-up FFA utilization rate: OB=41.1+/-8.4%, A=64.7+/-10.1%, A-OB=39.54+/-8.9%.

Individual gymnastics FFA utilization rate: OB=31,9+/-7,4%, A=35,4+/-6,95%, A-OB=16,4+/-6,1%, intensity (in METS): OB=2,9+/-0,84, A=4,72+/-0,72, A-OB=5,06+/-1,19 (p<0,05 in OB vs. A and in OB and A-OB)

Higher CHO utilization during higher intensity exercise caused a consistent increase in insulin in the A-OB group and was followed by lower venous partial O_2 pressure, similarly to the OB group. In parallel, muscle oxygen saturation decreased significantly and differently in the loaded muscles.

The average adiponectin in the A-OB group is 4.1+/-0.4 μg/ml, which is optimal above 10 μg/ml as per reference. Based on blood gas results, by-product elimination time corresponded with CHO/FFA utilization ratio, higher CHO levels caused decreasing in blood pH and $V'O_2<V'CO_2$ also indicated anaerobic phase.

Conclusions: In terms of obesity, it can be concluded that the inversely proportional decrease in oxygen supply with intensity hinders weight loss through higher CHO consumption.

The decrease in FFA utilization for a given movement follows body weight at the same intensity, i.e. only low-intensity movement (e.g. warm-up) was considered effective at greater body weight.

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41 Athletes		Gr-A	BMI	24,84	Weight(kg)	Height (m)		Serum	FFA	Workload
Characteristic individual results		Blood gas analysis -By-product elimination			85	1,85		Insulin	utilization	average
MEAL: 15g CHO containing		pH (7,35-7,45)	pCO2 (<45)	pO2 (>30)	BE (3,5-7,0)	Glucose mg/dl	Lactate (<0,6)	3-23,2miU/ml	%	METS
Before meal	0 min	7,403	45,5	21,6	3,6	97	1,35	9,2	77,86	1,81
After meal	60 min							25,2	32,56	1,74
Warm-up	20 min	7,369	44,4	38,0	4,1	82	1,48	4,7	54,95	2,41
YMCA test	9 min / High int.	7,302	52,4	38,0	-3,8	82	7,43	10,9	17,91	7,92
Cross fitt	6 min / High int.	7,321	40,7	43,4	-5,3	84	4,50	7,7	27,4	5,94
Running	10 min/ Mod. Int	7,374	42,8	51,0	-1,2	84	3,21	3,7	46,89	5,19
Guided training	20 min/ Mod. Int	7,351	46,5	39,8	0,2	84	2,39	4,6	48,10	4,14
Recovery	20 min	7,392	44,7	53,9	2,2	96	1,26	2,5	83,71	1,42
15 Athletes with obesity		Gr-A-OB	BMI	33,14	Weight(kg)	Height (m)		Serum	FFA	Workload
Characteristic individual results		Blood gas analysis -By-product elimination			105	1,78		Insulin	utilization	average
MEAL: 15g CHO containing		pH (7,35-7,45)	pCO2 (<45)	pO2 (>30)	BE (3,5-7,0)	Glucose mg/dl	Lactate (<0,6)	3-23,2miU/ml	%	METS
Before meal	0 min	7,345	56,4	26,1	5,1	94	1,53	31,4	46,1	1,51
After meal	60 min							82,1	7,72	1,58
Warm-up	20 min	7,280	63,1	33,3	2,4	85	4,49	47,9	37,17	2,74
YMCA test	9 min / High int.	7,251	54,5	27,9	-4,7	81	10,23	20,9	3,58	9,08
Cross fitt	6 min / High int.	7,349	45,4	26,5	-8,9	86	6,30	17,9	18,91	7,06
Running	10 min/ Mod. Int	7,337	61,0	27,0	-4,5	89	7,89	37,5	25,80	4,68
Guided training	20 min/ Mod. Int	7,351	55,9	39,8	-1,1	84	5,64	28,7	22,10	5,51
Recovery	20 min	7,408	52,3	28,1	0,1	91	3,74	48,7	29,77	1,70
77 Participants with obesity		Gr-OB	BMI	34,08	Weight(kg)	Height (m)		Serum	FFA	Workload
Characteristic individual results		Blood gas analysis -By-product elimination			96,2	1,68		Insulin	utilization	average
MEAL: 15g CHO containing		pH (7,35-7,45)	pCO2 (<45)	pO2 (>30)	BE (3,5-7,0)	Glucose mg/dl	Lactate (<0,6)	3-23,2miU/ml	%	METS
Before meal	0 min	7,356	50,4	28,5	2,70	99	1,47	6,50	37,82	1,87
After meal	60 min							28,70	32,51	2,01
Warm-up	20 min	7,336	46,8	21,8	-0,80	84	1,66	5,80	42,91	2,74
Walking	10 min	7,386	47,8	26,3	3,7	84	2,25	8,51	25,87	3,54
Guided training	20 min/ Mod. Int	7,365	54,5	21,7	5,8	84	1,26	24,90	38,69	2,87
Recovery	20 min	7,419	42,3	30,5	2,9	88	1,23	16,10	41,25	1,78

The figure shows the blood gas results in the three groups at each stage of the performance test. The rate of FFA utilization depends on the BMI, the response of insulin and venous partial pressure of oxygen. The by-product elimination time also can be calculated which seems to be a marker of the post-exercise value of FFA utilization.

Fig. 1. Know-how of individual by-product analysis and rate of FFA utilization in view of workload (in METS).

Tab. 1. Metabolic logistics and by-product elimination.

Antropometry and hormones		BMI	Insulin (0 min)	Insulin Recovery	Adiponectin	Total FFA utilization (g)
Group OB	Average	34,84	19,89	27,84	3,98	12,98
77 participants	SD	4,51	8,49	6,78	2,05	3,40
Group A	Average	24,73	11,16	10,01	7,52	**25,57**
41 participants	SD	3,15	7,35	7,83	3,71	19,80
Group A-OB	Average	35,53	14,98	22,47	4,10	**26,97**
15 participants	SD	2,63	8,03	12,84	1,47	5,38
METABOLIC LOGISTICS		Individual gymnastic, warm-up for Gr. OB		Individual intensive training (IT) or 10 min training for gr. OB		Total CHO utilization (g)
QUANTIFYING THE LOAD		Rate of FFA %	Load in METS	Rate of FFA %	Load in METS	
Group OB	Average	43,40	2,16	29,80	3,64	64,10
77 participants	SD	9,12	0,62	9,78	1,55	12,50
Group A	Average	28,02	5,04	10,98	**7,59**	**102,76**
41 participants	SD	13,08	0,94	8,03	0,92	27,87
Group A-OB	Average	30,61	4,02	19,31	5,61	**125,66**
15 participants	SD	6,79	0,75	10,79	0,94	21,69
By-product elimination		0 min	After (IT)	Recovery		pH after IT (high intentity)
		Venous partial pressure $O_{2\ (pO2)}$ (ref. >30 mmHg)			pH 0 min	
Group OB	Average	29,70	31,20	**27,80**	7,370	7,341
77 participants	SD	8,90	11,80	9,40	0,051	0,045
Group A	Average	32,73	44,78	34,30	7,336	**7,266**
41 participants	SD	9,91	12,49	9,06	0,032	0,061
Group A-OB	Average	32,83	36,66	**28,75**	7,353	7,318
15 participants	SD	4,24	12,08	7,03	0,031	0,029

The table shows the summarized data of the groups. The higher CHO utilization in group A-OB is associated with a similarly high insulin and decreased pO2 response in recovery as in group-OB, but this is known to cause a delay in FFA utilization during the rest period, e.g. slowing down the rate of weight reduction. The higher by-product production after intensive training causes that the FFA utilization calculated for the total training does not differ between group-A and group A-OB. However CHO utilization differs.

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Our previous results showed that increasing resting FFA utilization leads to the achievement of weight reduction goals. In addition, the insulin and adiponectin values of the A-OB group were essentially not different from those of the OB group, so the existence of cardiovascular risk was provable also in those doing sports regularly.
The prolongation of by-product elimination time in obesity confirmed the negative effect of anaerobic metabolism on FFA utilization, so there is a need to include rest periods in trainings.

PO4.132

Association between Baseline hsCRP Level and Post-Partum Weight Retention

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Introduction: Periodontitis and maternal obesity during gestation both increases the level of systemic inflammation during pregnancy which potentially associates with an increased risk of excess post-partum weight retention (PPWR). Using serum C-Reactive Protein (CRP)-level as a measure of the degree of systemic inflammation we aimed to investigate if hsCRP level measured during week 13 of gestation was associated with 2-months post-partum weight retention.
Methods: Data were obtained from the controlled intervention study "The Prevention of Adverse Pregnancy Outcomes by Periodontal Treatment (PROBE)". PROBE will recruit 400 pregnant women in gestational weeks 11-19 from Region Zealand in Denmark diagnosed with periodontitis. The first 200 recruited women received periodontal treatment during pregnancy, and the remaining 200 recruited women will receive periodontal treatment after pregnancy. Non-fasting blood was drawn during gesta-tion week 11-13 and 35-36 and questionaries was sent to the participant's E-box (a secure digital mailbox used in Denmark for receiving official and personal documents) and completed twice during pregnancy, at two months post-partum and at four months post-partum.
Results: Data from the initial 122 out of 200 pregnant women diagnosed with and treated for periodontitis are included in the present preliminary analysis. A multiple linear regression analysis was performed to investigate the possible association between baseline hsCRP and 2-months PPWR. The analysis was adjusted for age, region, periodontitis stage and grade, pre-pregnancy BMI, smoking, socioeconomic status, physical activity and parity. The preliminary data showed no significant association between hsCRP (mg/dL) and PPWR (kg) (β = 6.9 mg/dL per kg (95% CI: -6.09, 19.89), P=0.30). Data from the remaining 88 pregnant women are currently being processed and results from analyses including all 200 women will be presented at the conference.
Conclusion: The adjusted multivariable linear regression analysis in the subgroup of the study population showed no significant association between hsCRP level in the early pregnancy and post-partum weight retention at two months. The updated results will be presented at the conference.

PO4.133

Efficacy and Safety of Celosia cristata Extract Supplementation for Reducing Body Fat: A 12-Week, Randomized, Double-Blind, Placebo-Controlled Clinical Trial

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Introduction: Obesity, characterized by excessive fat accumulation due to energy imbalance, is a growing global health issue. It is associated with insulin resistance, inflammation, and increased risks of type 2 diabetes, cardiovascular disease, and musculoskeletal disorders, contributing to significant public health and socioeconomic challenges. We hypothesized that an intake of Celosia cristata flower extract (CC) would decrease body fat and then investigated the effects and safety of CC intake on body fat in adults with obesity as an option for obesity treatment.
Methods: In this double-blind, randomized, placebo-controlled study, 91 adults with body mass indices of 25 to 29.9 kg/ m² were assigned to groups that received CC (n = 46) or a placebo (n = 45) and received 2 capsules/ day containing 480 mg of CC or the placebo over a 12-week period. The primary endpoint was the change in mass and percentage of body fat.
Results: The group that received CC daily showed decreases in body fat mass greater than those in the placebo group (−1.0 ± 1.8 kg vs. −0.2 ± 1.5 kg, P = 0.037). In addition, the CC group showed a significant reduction in body fat percentage (−0.77 ± 1.75%) compared to the control group, which exhibited a slight increase (0.15 ± 1.67%), resulting in a statistically significant difference between the groups (P = 0.017). Hip circumference improved after the intake of CC relative to the changes in the placebo group (−0.94 ± 1.37 cm vs. −0.21 ± 1.49 cm, P = 0.019). Adiponectin levels increased in the CC group while decreasing in the placebo group, with statistically significant differences (P = 0.015). There were no intergroup differences in the prevalence of adverse events.
Conclusion: A 12-week intake of 480 mg/day of CC in adults with obesity improved the accumulation of excess body fat without serious adverse effects, highlighting its potential as a safe and effective option for managing obesity. The trial was registered at Clinical Research Information Service (CRIS: https://cris.nih.go.kr/cris/index/index.do) as KCT0008220.

PO4.134

External validation of the fatty liver index correlated to fibroscan for identifying nonalcoholic fatty liver disease with fibrosis

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Introduction: Nonalcoholic fatty liver disease (NAFLD) is a global health concern linked to sedentary lifestyles and excessive calorie intake. It ranges from nonalcoholic fatty liver (NAFL) without injury to nonalcoholic steatohepatitis (NASH), which can progress to fibrosis or cirrhosis, with an increased risk of cirrhosis and hepatocellular carcinoma. The prevalence in Asia (27.37%) exceeds the global average (25.24%). While Fibroscan, which measures liver stiffness (LSM) and controlled attenuation parameter (CAP), is noninvasive yet costly, the Fatty Liver Index (FLI) provides a simpler, noninvasive tool for risk assessment, with FLI <30 indicating no fatty liver and FLI ≥60 indicating fatty liver. The aim of this study was to determine the optimal FLI cutoff for Fibroscan screening in a Chinese population.
Methods: This retrospective cohort study included 2,591 individuals who underwent Fibroscan-based liver fat quantification at a Health Management Center in Taiwan between November 2018 and July 2019. Fatty liver status was assessed using CAP, with CAP <215 dB/m indicating

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no fatty liver and CAP ≥215 dB/m indicating the presence of fatty liver. FLI was calculated using an established formula based on body mass index, waist circumference, triglyceride levels, and gamma-glutamyl transferase levels. Statistical analysis was conducted using SAS software (MultAUC macro) to calculate AUC values, sensitivity, specificity, and 95% confidence intervals (CIs). A p-value threshold of <0.05 was used for statistical significance.

Results: Binary logistic regression was first used to identify the optimal FLI cutoff, with CAP as the reference standard. Due to suboptimal sensitivity and specificity, multinomial logistic regression was applied, categorizing participants into four groups based on CAP and liver stiffness measurements:

- No fatty liver (CAP <215 dB/m)
- Mild fatty liver (215 ≤ CAP < 252 dB/m)
- Moderate to severe fatty liver without fibrosis (CAP ≥252 dB/m & LSM <7 kPa)
- Moderate to severe fatty liver with fibrosis (CAP ≥252 dB/m & LSM ≥7 kPa)

FLI cutoffs were assessed for distinguishing these groups, and AUC, sensitivity, specificity, and optimal cutoff values were determined for males and females separately. Further stratified binary logistic regression models were conducted to refine FLI cutoffs for the following comparisons:

- No fatty liver vs. mild fatty liver
- No fatty liver vs. moderate to severe fatty liver without fibrosis
- No fatty liver vs. moderate to severe fatty liver with fibrosis

Each model was stratified by gender to derive tailored cutoff values. AUC, sensitivity, specificity, and cutoff values were reported for each subgroup.

Conclusion: This study demonstrates that the Fatty Liver Index (FLI) is an effective noninvasive tool for identifying fatty liver and assessing its severity, compared to CAP. Multinomial and binary logistic regression analyses refined the FLI cutoffs, achieving 80-90% sensitivity and specificity, especially for moderate-to-severe fatty liver with and without fibrosis. Optimized FLI cutoffs can serve as a reliable preliminary screening method, particularly in resource-limited settings.

Tab. 1.

	Multi-level AUC	Pairwise AUC (Milf fatty vs. No fatty liver)	Pairwise AUC (Moderate to Severe fatty liver without fibrosis vs. No fatty liver)	Pairwise AUC (Moderate to Severe fatty liver with fibrosis vs. No fatty liver)
Male	0.67	0.68	0.86	0.96
Female	0.68	0.70	0.87	0.99

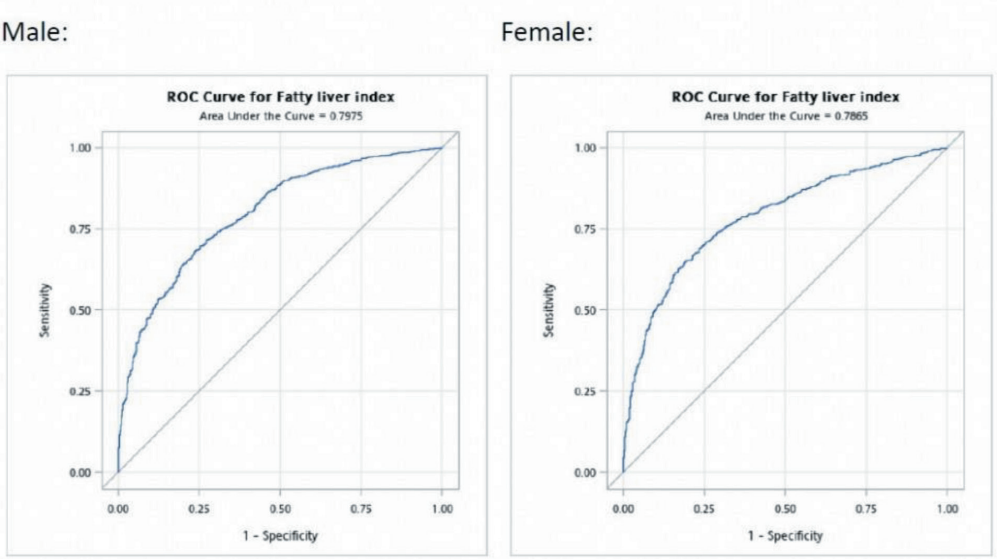
To determine the optimal cutoff value for the Fatty Liver Index, a multinomial logistic regression analysis was conducted using the SAS statistical software, specifically the MultAUC macro. The analysis was further stratified by gender to evaluate differences between male and female subjects more accurately. The Controlled Attenuation Parameter (CAP) is used as the gold standard for assessing fatty liver disease. The classifications based on CAP values are as follows: • CAP < 215: No fatty liver. • 215 ≤ CAP < 252: Mild fatty liver. • CAP ≥ 252 and Kpa < 7: Moderate to severe fatty liver without fibrosis. • CAP ≥ 252 and Kpa ≥ 7: Moderate to severe fatty liver with fibrosis.

Tab. 2.

	AUC (95% CI)	Cutoffvalue	Sensitivity (95% CI)	Specificity (95% CI)
Male	0.68 (0.65-0.72)	12.7	0.74 (0.70-0.78)	0.53 (0.48-0.58)
Female	0.70 (0.67-0.74)	4.3	0.72 (0.67-0.76)	0.57 (0.53-0.61)

A binary logistic regression analysis was conducted to determine the cutoff value of the Fatty Liver Index for distinguishing between individuals with no fatty liver and those with mild fatty liver. The analysis was stratified by gender to assess differences between male and female subjects more accurately.

	AUC (95% CI)	Cutoff value	No. of cases TP	FP	TN	FN	Sensitivity (95% CI)	Specificity (95% CI)
Male	0.80 (0.77-0.82)	20.7	946	348	304	129	0.73 (0.71-0.75)	0.70 (0.66-0.74)
Female	0.79 (0.76-0.81)	6.1	478	167	407	172	0.74 (0.71-0.77)	0.70 (0.66-0.74)



The Controlled Attenuation Parameter (CAP) is used as the gold standard (CAP < 215 for no fatty liver, CAP ≥ 215 for fatty liver). Binary logistic regression is employed to determine the cutoff point of the Fatty Liver Index (FLI), with stratified analysis by gender

Fig. 1.

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Tab. 3.

	AUC (95% CI)	Cutoff value	Sensitivity (95% CI)	Specificity (95% CI)
Male	0.86 (0.84-0.88)	21.9	0.82 (0.79-0.85)	0.73 (0.68-0.77)
Female	0.87 (0.85-0.90)	6.8	0.86 (0.81-0.90)	0.74 (0.71-0.78)

A binary logistic regression analysis was conducted to determine the cutoff value of the Fatty Liver Index for distinguishing between individuals with no fatty liver and those with moderate to severe fatty liver without fibrosis. The analysis was stratified by gender to assess differences between male and female subjects more accurately.

Tab. 4.

	AUC (95% CI)	Cutoff value	Sensitivity (95% CI)	Specificity (95% CI)
Male	0.96 (0.94-0.98)	34.5	0.94 (0.87-0.97)	0.87 (0.84-0.90)
Female	0.99 (0.98-1.00)	21.0	0.97 (0.85-0.99)	0.94 (0.92-0.96)

A binary logistic regression analysis was conducted to determine the cutoff value of the Fatty Liver Index for distinguishing between individuals with no fatty liver and those with moderate to severe fatty liver with fibrosis. The analysis was stratified by gender to assess differences between male and female subjects more accurately.

PO4.135

Beneficial effect to MASLD with SGLT2i and TZD combination therapy

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Introduction: To define the beneficial role of Sodium-Glucose Co-Transporter 2 Inhibitors (SGLT2i) and thiazolidinedione (TZD) combination therapy to improve the metabolic dysfunction associated steatotic liver disease (MASLD).
Methods: Type 2 diabetes participants (n=16) with elevated ALT level (40 IU/L) were recruited in this study. Fibroscan and measurement of FIB-4 and NFS were taken before and 3 months after treatment of simultaneous SGLT2i and TZD combination therapy.
Results: Simultaneous SGLT2i and TZD combination therapy improved the steatosis of MASLD with CAP (305.56 ± 24.39 dB/m to 271.75 ± 23.30 dB/m) and showed possibility to improve of halt the progression of liver fibrosis with stiffness (5.22 ± 1.28 kPa to 4.89 ± 1.02 kPa).
Conclusion: Simultaneous SGLT2 and TZD combination therapy might be promising therapy to patients with T2DM and MASLD.

PO4.136

Efficacy and safety of High dose Pioglitazone as Add-on Therapy in Patients with Type 2 Diabetes Mellitus Inadequately Controlled with Dapagliflozin and Metformin: Double-Blind, Randomized, Placebo-Controlled Trial

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Background: This study investigated the efficacy and safety of pioglitazone 30 mg/day add-on to inadequately controlled type 2 diabetes (T2D) patients with treatment of dapagliflozin and metformin, as a triple combination.
Methods: In this multicenter (34 sites), double-blind, randomized, phase 3 study, patients with T2D with an inadequately controlled glycosylated hemoglobin (HbA1c) over 7.0% to treatment with dapagliflozin (10 mg/day) and metformin (≥1,000 mg/day) were randomized to receive additional pioglitazone 30 mg/day (n=124) or placebo (n=122) for 24 weeks. The primary outcome was the mean change of HbA1c from baseline to 24 weeks treatment The efficacy and safety were evaluated with open label extension period, switching placebo to pioglitazone 30 mg/day at 48 weeks (ClinicalTrials.gov identifier: NCT05296044).
Results: The HbA1c after 24 weeks treatment of high dose pioglitazone 30mg/day reduced from 7.83 ± 0.877 % to 7.02 ± 0.64 % (P <0.0001) at 24 weeks. The proportions of patients who achieved HbA1c less than 7.0% at 24 weeks were significantly higher in pioglitazone add-on group (51.61% in pioglitazone versus 22.95% in placebo, P<0.0001), or less than 6.5% at 24 weeks (21.77% in pioglitazone versus 2.46% in placebo, P<0.0001). Besides of glucose lowering efficacy with pioglitazone add-on to dapagliflozin and metformin, there was no adverse event of hypoglycemia. Body weight gain was 2.0 kg at 24 weeks with pioglitazone 30 mg/day and -0.6 kg at 24 weeks with placebo, 1 patient presented generalized edema and other 1 patient presented facial edema with treatment with pioglitazone 30 mg/day, however there was no need to discontinue the medication with improvement within primary study period and extension period.
Conclusion: Addition of pioglitazone 30 mg/day to T2D patients who did not reach the target HbA1c (≤ 7%) with treatment of dapagliflozin 10 mg/day and metformin over 1000 mg/day showed effective glucose lowering efficacy without significant hypoglycemia and good tolerability with low prevalence of edema in spite of modest weight gain.

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PO4.137

Effect of Aerobic, Resistance Exercise or Both in Dieting Older Adults with Obesity on Ciliary Neurotrophic Factor and Insulin Secretion: a Randomized Control Trial

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Introduction: Obesity exacerbates age-related changes in metabolic and physical functions. Ciliary Neurotrophic Factor (CNTF) is a cytokine released by peripheral nerves that helps repair tissue damages, possibly also those caused by excessive fat mass accumulation. However, the effects of distinct exercise therapies combined with diet-induced weight loss on insulin secretion and levels of circulating Ciliary Neurotrophic Factor (CNTF) and its receptor CNTFRα have not yet been studied in older adults with both, obesity and frailty.
Methods: In this ancillary study of the randomized controlled trial LITOE (NCT01065636), we compared the effects of aerobic (AEX), resistance (REX), or combination (COMB) exercise during matched ~10% weight loss in 160 older adults with obesity. We compared 6-month changes in truncal fat and appendicular lean masses by dual x-ray absorptiometry; CNTF, CNTFRα, and IGF-1 levels by ELISA; insulin sensitivity by HOMA-IR and insulin secretion by Disposition Index (DI) assessed during OGTT; vastus lateralis muscle gene expression of CNTF and CNTFRα by qPCR. Stepwise multiple regression analysis was employed to identify the main predictors of the changes in serum CNTF, DI, and physical function. Hence, this study exploited additional data collected with the main trial (physical function test -PPT-, muscle strength, VO2peak, body composition by MRI, serum Leptin and Adiponectin)
Results: Truncal fat mass decreased more in AEX and COMB (p=0.001), similar to the appendicular lean mass, which was better preserved in REX (p=0.001). HOMA-IR improved more in COMB compared to AEX and REX (p<0.001), while DI improved in COMB compared to controls (p=0.04). Serum CNTF levels decreased across all active groups (p<0.001), while only COMB preserved CNTFRα serum levels (p=0.003) and exhibited the most significant reduction in CNTF/CNTFRα. In the vastus lateralis, CNTF and CNTFRα expression did not differ. IGF-1 improved more in REX and COMB (p=0.004). Changes in visceral fat volume and serum Leptin accounted for 49.6% of serum CNTF variations (p<0.009). CNTFRα changes were among the main predictors of the variation of DI (explaining 38.3% of its variability, along with intermuscular fat change, p=0.004) and PPT changes (accounting for 57.4% of its variability, together with intermuscular fat, muscle strength, and VO2peak changes, p=0.03).
Conclusions: In older adults with obesity, a combination of exercise and diet-induced weight loss leads to the greatest improvements in metabolic and physical functions and the preservation of circulating CNTFRα. This finding, along with identifying CNTFRα changes as key predictors of improved insulin secretion and physical function, suggests that CNTF/CNTFRα signaling may play a significant role in mediating the health benefits associated with lifestyle therapy.

PO4.138

Efficacy and safety of active phase of Very Low Energy Ketogenic Therapy (VLEKT) in subjects with obesity and mild renal impairment

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Introduction: Obesity adversely affects renal function through both direct mechanisms, such as the production of proinflammatory adipocytokines, and indirect mechanisms, including obesity-related comorbidities. Despite the rising prevalence of obesity and chronic kidney disease (CKD), clinical guidelines for their combined management are lacking. Very Low Energy Ketogenic Therapy (VLEKT) has shown efficacy in weight loss, but there is limited evidence on the safety and efficacy of its active phase in individuals with obesity and mild renal impairment.
Methods: This cross-sectional study included 73 participants with overweight or obe-sity (mean age 53.7 ± 8.82 years; BMI 35.30 ± 4.22 kg/m²) and mild renal impairment (60 ml/min/1.73m² < eGFR < 90 ml/min/1.73m²). Anthropometric parameters (weight, BMI, and waist circumference) and biochemical data (fasting plasma glucose and fasting plasma insulin, HOMA-IR, cholesterol profile, triglycerides, AST, ALT and azotemia) were collected at baseline and at the end of the active phase of VLEKT. Renal function was assessed using the CKD-EPI equation.
Results: The active phase of VLEKT led to significant reductions in BMI, waist cir-cumference, fasting plasma glucose, fasting plasma insulin, HOMA-IR, total cholester-ol, cholesterol profile, triglycerides, AST, and ALT levels. Participants were divided into two groups based on eGFR values of < 90 ml/min/1.73m² or ≥ 90 ml/min/1.73m². Improvements in AST and ALT were more pronounced in participants with eGFR ≥90 ml/min/1.73m². No significant changes in eGFR were observed in either group.
Conclusions: The active phase of VLEKT was effective in achieving significant weight loss and metabolic improvements without adversely affecting renal function, even in individuals with mild renal impairment. These findings highlight the potential utility of VLEKT in managing obesity and its complications, although further research is needed to evaluate outcomes across all phases of the protocol.

Conflict of Interest: None Disclosed

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Tab. 1.

Parameters	Baseline (n = 73)	End of active phase (n = 73)	p-value	Δ%
Anthropometrical parameters				
Weight (kg)	97.69 ± 13.27	88.97 ± 12.52	<0.001	-8.95 ± 2.92
BMI (kg/m2)	35.27 ± 4.23	32.15 ± 4.17	<0.001	-8.95 ± 2.92
Normal weight (n,%)	0	1 (1.4)	χ2= 0.01, p=1.000	
Overweight (n,%)	6 (8.2)	23 (31.5)	χ2= 11.02, p<0.001	
Obesity I class (n,%)	30 (41.1)	30 (41.1)	χ2= 0.03, p=0.866	
Obesity II class (n,%)	26 (35.6)	16 (21.9)	χ2= 2.71, p=0.099	
Obesity III class (n,%)	11 (15.1)	3 (4.1)	χ2= 3.87, p=0.048	
WC (cm)	105.49 ± 10.02	98.52 ±10.14	<0.001	-6.63 ± 3.06
Biochemical parameters				
Fasting plasma glucose (mg/dL)	102.07 ± 15.74	91.90 ± 12.37	<0.001	-8.92 ± 12.05
Fasting plasma insulin (μIU/ml)	17.96 ± 10.21	8.30 ± 3.80	<0.001	-47.30 ± 26.66
HOMA-IR	4.68 ± 3.30	1.92 ± 1.01	<0.001	-50.72 ± 29.23
Total cholesterol (mg/dL)	214.11 ± 38.84	173.99 ± 34.76	<0.001	-19.26 ± 15.20
HDL cholesterol (mg/dL)	53.36 ± 16.41	51.85 ± 14.19	0.253	-0.01 ± 21.22
LDL cholesterol (mg/dL)	135.28 ± 32.92	104.23 ± 28.05	<0.001	-22.17 ± 15.66
Triglycerides (mg/dL)	131.75 ± 73.09	92.83 ± 33.41	<0.001	-22.92 ± 25.65
AST (U/L)	23.73 ± 10.53	20.30 ± 8.63	0.001	-10.06 ± 27.30
ALT (U/L)	29.51 ± 15.81	24.18 ± 13.66	<0.001	-12.11 ± 28.70
eGFR (ml/min/1.73m2)	90.23 ± 14.57	92.58 ± 13.69	0.062	3.58 ± 12.72
< 90 ml/min/1.73m2 (n,%)	40 (54.8)	29 (39.7)	χ2= 2.75, p=0.097	
≥ 90 ml/min/1.73m2 (n,%)	33 (45.2)	44 (60.3)	χ2= 2.75, p=0.097	
Azotemia (mg/dL)	37.24 ± 9.72	37.26 ± 12.15	0.987	1.31 ± 27.27

Baseline characteristics and changes in anthropometric and biochemical parameters from baseline to the end of the active phase of VLEKT in the entire study population.

Tab. 2.

Parameters	< 90 ml/min/1.73m2			≥ 90 ml/min/1.73m2		
	Baseline (n = 40)	End of the active phase (n = 40)	p-value	Baseline (n = 33)	End of the active phase (n = 33)	p-value
Anthropometrical parameters						
Weight (kg)	95.87 ± 11.95	86.94 ± 10.93	<0.001	99.89 ± 14.58	91.43 ± 13.98	<0.001
BMI (kg/m2)	34.18 ± 3.89	31.04 ± 3.77	<0.001	36.58 ± 4.29	33.48 ± 4.28	<0.001
Normalweight (n,%)	0 (0.0%)	1 (2.5%)		0 (0.0%)	0 (0.0%)	
Overweight (n,%)	5 (12.5%)	15 (37.5%)		1 (3.0%)	8 (24.2%)	
Obesity I class (n,%)	18 (45.5%)	20 (50.0%)		12 (36.4%)	10 (30.3%)	
Obesity II class (n,%)	14 (35.0%)	3 (7.5%)		12 (36.4%)	13 (39.4%)	
Obesity III class (n,%)	3 (7.5%)	1 (2.5%)		8 (24.2%)	2 (6.1%)	
WC (cm)	104.13 ± 10.22	97.05 ± 10.62	<0.001	107.12 ± 9.66	100.30 ± 9.37	<0.001
Biochemical parameters						
Fasting plasma glucose (mg/dl)	102.72 ± 16.45	90.40 ± 10.27	<0.001	101.27 ± 15.02	93.72 ± 14.48	0.004
Fasting plasma insulin (μIU/ml)	17.01 ± 9.36	8.43 ± 3.25	<0.001	19.11 ± 11.18	8.13 ± 4.40	<0.001
HOMA-IR	4.53 ± 3.52	1.91 ± 0.89	<0.001	4.85 ± 3.03	1.92 ± 1.14	<0.001
Tot cholesterol (mg/dL)	214.71 ± 32.98	173.12 ± 33.37	<0.001	213.37 ± 45.51	175.03 ± 36.90	<0.001
HDL cholesterol (mg/dL)	54.79 ± 18.25	53.50 ± 14.72	0.503	51.54 ± 13.82	49.72 ± 13.43	0.316
LDL cholesterol (mg/dL)	133.84 ± 28.89	102.12 ± 26.49	<0.001	137.07 ± 37.79	106.87 ± 30.12	<0.001
Triglycerides (mg/dL)	121.71 ± 34.82	87.74 ± 25.38	<0.001	143.96 ± 101.46	99.03 ± 30.73	0.009
AST (U/L)	23.61 ± 9.93	20.76 ± 9.29	0.034	23.87 ± 11.36	19.72 ± 10.89	0.016
ALT (U/L)	27.15 ± 11.29	23.43 ± 8.47	0.009	32.30 ± 19.71	25.06 ± 18.08	0.004
eGFR (ml/min/1.73m2)	79.06 ± 8.29	85.61 ± 12.04	<0.001	103.75 ± 7.03	101.02 ± 10.52	0.072
Azotemia (mg/dL)	39.58 ±10.03	38.52 ± 11.46	0.393	34.39 ± 8.64	35.71 ± 12.93	0.523

Changes in anthropometric and biochemical parameters from baseline to the end of the active phase of VLEKT in participants divided according to baseline eGFR.

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PO4.139

Weight Maintenance After Discontinuing a Remotely-Delivered GLP-1 Receptor Agonist-Supported Weight Management Programme: A Preliminary Analysis

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Second Nature Health

Introduction: GLP-1 receptor agonist (GLP-1RA) medications are effective for managing obesity; however, weight regain following medication discontinuation has been observed in clinical trials, with patients regaining approximately 6% of lost weight within 12 weeks [1]. Digital interventions that combine medication with behavioural support may help address this challenge. This exploratory analysis investigated the impact of combining GLP-1RA medication with intensive lifestyle support through Second Nature's remotely-delivered, app-based weight management programme, including health coaching and educational content on weight maintenance after medication discontinuation in adults living with obesity.

Methods: Between November-December 2024, participants (BMI ≥30 kg/m²) who had cancelled their GLP-1RA-supported programme (semaglutide or tirzepatide) between April and August 2024 and achieved ≥10% weight loss during treatment were identified from the Second Nature database. The programme is self-funded, offering ongoing access to GLP-1RA medication and digital support. Participants can discontinue at any time, and the mean programme duration before discontinuation was analysed. Participants completed a questionnaire to confirm their current self-reported weight and that they had discontinued GLP-1RA medication. The primary outcome was percentage weight regain from the time of cancellation. Secondary outcomes included total weight loss (kg) and the proportion achieving ≥5%, ≥10%, and ≥15% weight loss from baseline. Due to the small sample size, descriptive statistics were used for quantitative analysis.

Results: A total of 84 eligible participants were identified, with 26.2% (n=22) completing the questionnaire. Participants (91% women) had a mean baseline BMI of 32.2 (SD 3.0) kg/m² and mean age of 43.3 years (SD 13.8). Of these, 41% were prescribed semaglutide and 59% tirzepatide. The mean programme duration before cancellation was 3.5 months (SD 1.00).

The mean weight regain from programme cancellation to the latest recorded weight was 3.2% (SD 4.9, min-max: -6.5 to 15.0%) or 2.5 kg (SD 4.0, min-max: -5.1 to 14.1 kg), with a mean time of 5.1 months (SD 1.2, min-max: 2.9 to 7.6 months) between cancellation and this measurement. The mean total weight loss from baseline to the latest recorded weight was 13.6% (SD 7.9) or 11.9 kg (SD 6.7), with a mean time of 8.6 months (SD 1.3) between baseline and the latest recorded weight. Of these, 90.9% (n=20) achieved ≥5% weight loss, 59.1% (n=13) achieved ≥10% weight loss, and 40.9% (n=9) achieved ≥15% weight loss.

Conclusion: This exploratory analysis indicates that combining GLP-1RA medication with digital behavioural support may help limit weight regain after medication discontinuation in adults living with obesity. Randomised controlled trials with larger cohorts and extended follow-up are needed to confirm these findings.

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PO4.140

Characteristics of participants who regained weight after withdrawal of tirzepatide: A post hoc analysis of SURMOUNT-4

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Introduction: In the SURMOUNT-4 (SM-4) clinical trial, withdrawing tirzepatide maximally tolerated dose (MTD) after a 36-week open-label lead-in treatment period resulted in substantial regain of lost weight, whereas continued treatment maintained and augmented initial weight reduction. In this post hoc analysis, we investigated the baseline characteristics (week 0) and change in weight and waist circumference at the end of the open-label lead-in period (week 36) associated with varying degrees of weight regain after tirzepatide withdrawal.

Methods: SM-4 participants who achieved ≥10% weight reduction with 36 weeks of tirzepatide treatment (MTD of 10 or 15 mg) and randomized to placebo (N=308) were included in this post hoc analysis. Participants' baseline characteristics, and change in weight and waist circumference were calculated descriptively by the degree of weight regain, from Week 36 to 88, as a percentage of weight reduction, from Week 0 to 36; <25% (n=54, least weight regain), ≥25 to <50% (n=77), ≥50 to <75% (n=103), and ≥75% (n=74, most weight regain).

Results: Participants in the lower weight regain groups exhibited significantly greater mean reductions in weight (%) from the start of the lead-in period to randomization; -23.6% in the <25% group, -23.4% in the ≥25 to <50% group, -22.6% in the ≥50 to <75% group, and -18.3% in the ≥75% group (p<.001). Similarly, greater reduction in mean waist circumference (cm) from the start of the lead-in period to randomization was also observed in participants with lower weight regain; -19.6 cm in the <25% group, -20.0 cm in the ≥25 to <50% group, -17.9 cm in the ≥50 to <75% group, and –16.2 cm in the ≥75% group (p=.022).

Amongst participants in SM-4 who had treatment with tirzepatide withdrawn, there were no significant differences in the demographic characteristics at baseline (Week 0) across the weight regain groups including sex, age, years of education and duration of obesity. Similarly, no differences in baseline clinical characteristics were noted including weight, waist circumference, blood pressure, lipids, glycemic control, insulin, renal function and obesity-related complications.

Conclusion: In this post hoc analysis of participants who were withdrawn from treatment with tirzepatide in the SURMOUNT-4 clinical trial, participants with less body weight regain demonstrated greater reductions in body weight and waist circumference during the initial open-label lead-in period. There were no significant differences in baseline demographic or clinical characteristics across groups with different degrees of weight regain. These findings are consistent with the multifactorial and complex nature of obesity.

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PO4.141

Dapiglutide for the Treatment of Obesity – A Double-Blind, Placebo-Controlled, Proof-of-Concept Study

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Background: Obesity is associated with low-grade inflammation, a key driver of obesity-related co-morbidities like cardiovascular disease. Dapiglutide, a once-weekly agonist of the glucagon-like peptide 1 (GLP-1) and glucagon-like peptide 2 (GLP-2) receptors, combines the weight-loss effect of GLP-1 with potential direct and indirect anti-inflammatory effects of GLP-2.
Methods: In a 12-week proof-of-concept, randomized, double-blind, placebo-controlled phase IIa trial, once-weekly treatment with 4 or 6 mg dapiglutide vs. placebo was evaluated in persons with obesity (BMI ≥30 kg/m2) without adjunct lifestyle intervention. Dose was escalated by 2 mg every third week (initial 2 mg). Key exclusion criteria included HbA1c ≥48 mmol/mol, a recent weight change ≥5%, and weight-lowering treatment. Primary endpoint was percent body weight (BW) change; other endpoints included change in HbA1c.
Results: Fifty-four adults living with obesity (63% females; mean BW 101.3 kg; mean BMI 35.2 kg/m^2) participated. Dapiglutide 4 and 6 mg reduced mean BW by -2.9% (P=0.483) and -4.3% (P=0.077) vs. -2.2% with placebo. BW reduction ≥3% was achieved by 39%, 50% and 80% in the placebo, the 4 mg and the 6 mg arm, respectively; and ≥5% BW reduction was achieved by 22%, 38% and 47%, respectively, in the three arms. Compared with placebo, dapiglutide 4 and 6 mg reduced HbA1c by -1.8 mmol/mol and -2.3 mmol/mol (unadj. P<0.001). Generally, dapiglutide appeared safe and well-tolerated with common adverse events being reduced appetite and nausea. No participants discontinued due to treatment-emergent adverse events.
Conclusions: Dapiglutide treatment for 12 weeks was not significantly superior to placebo in reducing BW in persons living with obesity. Furthermore, the AE profile indicates that doses were at the lower end of the therapeutic range. Thus, larger and longer studies with higher doses and adjunct lifestyle intervention are warranted to assess the weight-lowering potential of dapiglutide.

PO4.142

Comparison of anti-obese effects on GLP-1 analogue peptides, Semaglutide, Tirzepatide and Retatrutide using MC4R deficient obesity model mice

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Introduction: Melaocortin 4 receptor (MC4R) is expressed in hypothalamus and controls feeding behavior and energy homeostasis. MC4R is one of the pathways on POMC-MC4R pathway and leptin-MC4R pathway including leptin, POMC and PCSK1. POMC-MC4R pathway in hypothalamus controls food intake and body weight. People with POMC mutation causes severe early phase obesity, increase of food intake. However, there is no approved drugs treatment for POMC-MC4R pathway deficient diseases such as Prader–Willi syndrome. Recently, glucagon-like peptide-1 (GLP-1) receptor agonists, Semaglutide, Tirzepatide, Retatrutide were investigated as anti-obesity agents. However, there are few reports of non-clinical studies directly comparing these three GLP-1 analogues. In this study, we tried to confirm and compare the efficacy of these GLP-1analogues using MC4R KO mice, deficient with POMC-MC4R pathway and these results are useful to consider applying novel GLP-1 analogues for such highly un-met medical needs with MC4R-POMC pathway deficiency.
Method: Male MC4R KO and C57BL/6J mice were received for 35 weeks on a normal chow. Then, saline was administered subcutaneously to C57BL/6J mice and saline, 0.1 mg/kg Semaglutide, 0.05 mg/kg Tirzepatide or 0.05 mg/kg Retatrutide to MC4R KO mice once daily for 3 weeks. Changes in body weight (BW), food intake, body composition by EchoMRI-900 (Hitachi Aloka Medical, Ltd.), energy expenditure by Oxymax system (Columbus Instructions), and biochemical measurements were evaluated in MC4R KO mice.

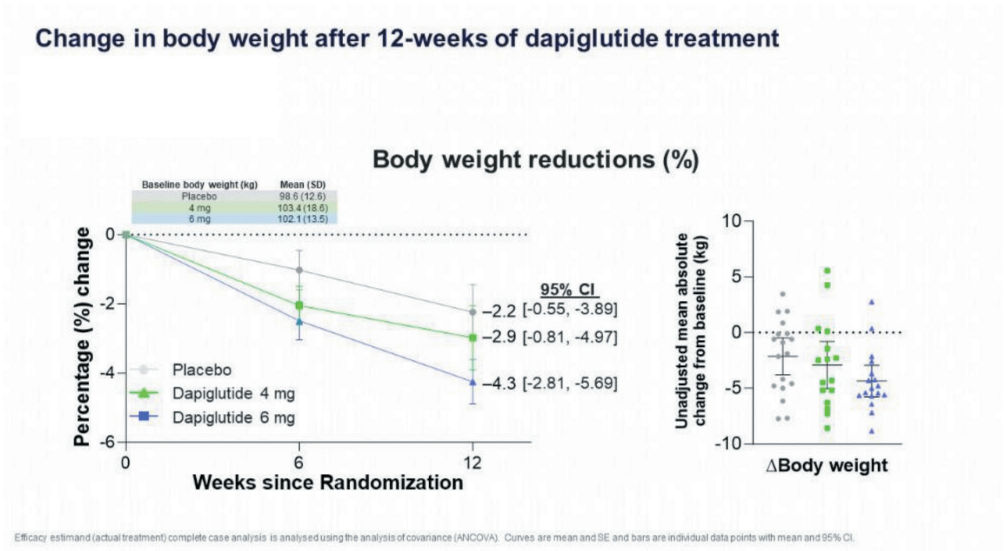


Fig. 1. Primary endpoint.

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Result: Significant increases in food intake, body weight, fat mass and lean mass were observed in MC4R KO mice compared to C57BL/6J mice. All three GLP-1 analogues significantly suppressed BW, food intake, fat mass in MC4R mice. Among three GLP-1 analogues, the most effective anti-obese effect was observed in tirzepatide treatment group. Similar with clinical study, these GLP-1 analogues suppressed lean mass and tended to decrease muscle amounts. Moreover, all three GLP-1 analogues significantly suppressed energy expenditure and only tirzepatide decreased respiratory quotient in MC4R KO mice.
Conclusion: In this study, we confirmed all GLP-1 analogs showed an excellent anti-obesity effect in MC4R KO mice. According to the study on energy expenditure evaluation, the reduction of lean mass and muscle amounts might be derived from decrease of energy consumption. Similar with clinical study, the anti-obese effect of tirzepatide and retatrutide were stronger than those of semaglutide treatment. Therefore, MC4R KO mice is a good animal model for obesity study to show clinically relevant effect of GLP-1 analogues and they would be a good treatment option for People with MC4R-POMC pathway deficiency.

PO4.143

A novel framework to assess the prevention value of a health intervention

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Background: Health and productivity are linked, yet health systems and governments typically prioritise valuing treatment, and invest less in prevention where 'value' is more challenging to quantify. Shifting this focus could better align health policy incentives and promote health driven prosperity. Obesity is a prime example of a growing societal issue: with rising global prevalence and association with more than 200 obesity-related complications, the need for prevention is becoming increasingly important. There is growing interest in capturing broader impacts of prevention on wider economic and societal outcomes, however, this has been challenging to date with lack of consensus and emerging methodologies. We present a comprehensive framework to support assessment of prevention value from a range of stakeholder perspectives, including individual, health system and government. We use obesity prevention as an illustrative example.
Methods: We identified three framework domains in which to group components of value: individual health and health system, societal, and government. For each framework domain, a targeted literature review was conducted to identify relevant existing frameworks and value components for inclusion. These were assessed against four criteria: relevance to obesity, relevance to prevention, geographic generalisability and methodological feasibility to quantify value components. Interviews were conducted with six health economic and health policy experts to shortlist value components and judge their inclusion into the framework using the four criteria.
Results: A total of 29 value components were identified: 7 individual health and healthcare system, 18 societal and 4 government. The assessment criteria were used to shortlist 17 components for inclusion into the framework. These were grouped into 9 categories across the 3 domains: individual health, and healthcare system (individual health and health system); productivity, family impact, health equity and social mobility, and environmental impact (societal); income related benefits, sickness benefits, and income tax (government). We define each included value component, describe reasons for inclusion, and identify potential methodology for quantification. Worked examples illustrate the applicability of the framework using two hypothetical intervention effects in the UK population: a 5% obesity incidence reduction and a 0.5-unit improvement in SF-12 physical and mental component summary scores. We shortlist six value components for future consideration in the framework, for which current data and methodologies are limited.
Conclusion: We have developed a novel framework to holistically assess prevention value, going beyond traditional health benefit measures, and illustrate relevant valuation methods to quantify the impacts of interventions on each value component. While we use obesity prevention as an illustrative example, the framework and methodologies could be generalised to other disease areas. The framework should now be tested with live interventions and with key health policy stakeholders in order to standardise methodologies and enhance future acceptability and use.

PO4.144

Gene expression of skeletal muscle is not differently regulated in weight-matched DIO mice treated with survodutide or semaglutide

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Introduction: Anti-obesity therapies are known to cause beneficial fat mass loss. However, there is an ongoing discussion with regards to their impact on lean mass. Survodutide is a dual glucagon/ glucagon-like peptide-1 (GLP-1) receptor agonist, while semaglutide is a mono GLP-1 receptor agonist. Since glucagon is known to promote skeletal muscle degradation to supply amino acids for gluconeogenesis, it could be hypothesized that survodutide leads to skeletal muscle mass loss. To test this assumption, a study comparing the effects of survodutide and semaglutide on skeletal muscle gene expression in diet-induced obese (DIO) mice was performed.
Methods: Mice were fed a high-fat diet (HFD) for 4 months, and then treated with either survodutide, semaglutide (both at 20 nmol/kg s.c. q.d. for 3 weeks, 8 mice/group) or vehicle. Body composition and bulk RNA sequencing in skeletal muscle (gastrocnemius and soleus) were performed.
Results: Comparable weight loss was achieved with survodutide (19.5±8.8%, mean±SD) and semaglutide (21.7±4.3%), vs. baseline, $p<0.05$ for both treatments. Notably, lean mass loss was not significantly different when comparing survodutide (5.0±5.5%) with semaglutide (5.8±4.9%). Bulk RNA sequencing of the fast-twitch, type II-fiber (gastrocnemius) and the slow-twitch, type I-fiber (soleus) skeletal muscles was performed. The results showed no genes being significantly differently regulated when comparing DIO mice administered with survodutide or semaglutide based on cutoff (L2FC <–1 or L2FC >1 & p.adj <0.05). When comparing survodutide or semaglutide administered animals with vehicle control, fewer than 50 differently expressed genes in both the gastrocnemius and soleus muscles were identified.
Conclusion: Weight-matched dosing with survodutide or semaglutide led to comparable and significant bodyweight and lean mass loss in DIO mice, but with no differences in lean mass loss when comparing the two treatments. Importantly, RNA sequencing of the gastrocnemius and soleus muscles revealed no significant differently regulated genes between treatment groups. The data indicate that the glucagon component of survodutide does not differently impact skeletal muscle gene expression compared to semaglutide. These findings provide reassurance regarding the use of survodutide as an anti-obesity therapy.

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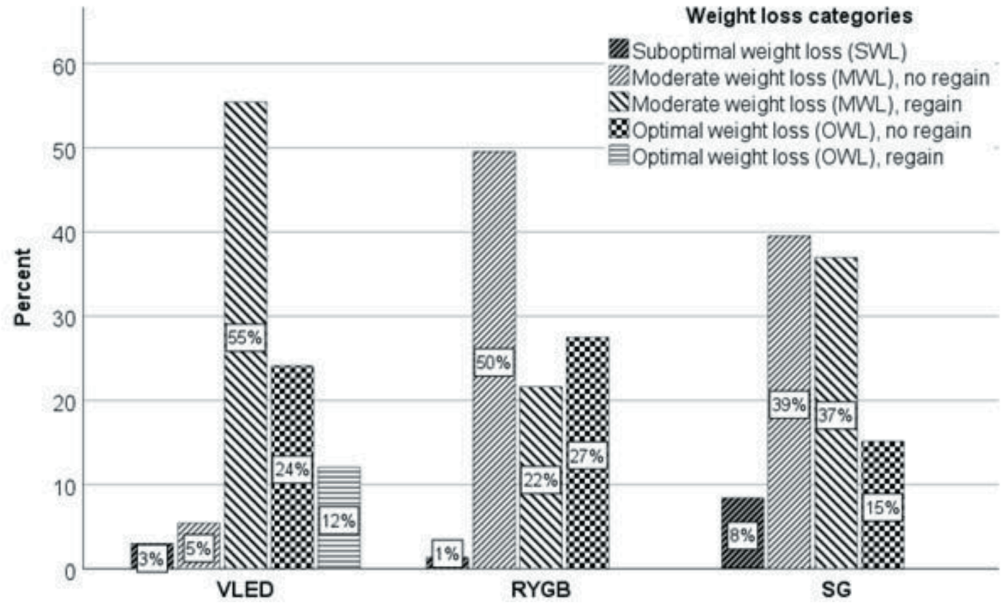
PO4.145

Eating behaviors and weight loss outcome of obesity treatment – 5-year follow-up after medical treatment and bariatric surgery

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Objective: Evaluate the effect of pre-treatment eating behavior on weight loss outcomes 5 years after obesity treatment.
Methods: A prospective, clinical cohort study with 5 years follow-up of 507 adults (54.7% of baseline group, 74.9% females) with initial BMI ≥35 kg/m2, undergoing surgical treatment or started a 12-month medical weight loss treatment program (VLED), between 2015-2017. Baseline eating behaviors: Emotional eating (EE), Uncontrolled eating (UE), Cognitive restraint eating (CR) and occurrence of binge eating disorder (BED) and nocturnal eating (NE) were assessed. To evaluate effect on weight loss outcomes in the lowest and highest range, weight loss was divided into categories. For VLED treatment a suboptimal weight loss (SWL) was set to <5% total weight loss (TWL), and an optimal weight loss (OWL) to ≥10% TWL. For bariatric surgery, SWL was categorised to <20% TWL, and OWL to ≥35% TWL. Achieving weight loss between the lowest and highest category was labelled moderate weight loss (MWL). Recurrent weight gain was defined as a regain of >30% of maximum weight loss. Weight loss expressed as total weight loss (TWL).
Results: From baseline to 5 years, the VLED group lost -6.5±14.1%, RYGB -28.1±10.5%, and SG: -23.1±11.6%, p<0.05 between treatments. Of those who underwent medical treatment (VLED group), 36.1% lost ≥10% (optimal weight loss, OWL) of the initial weight. For the surgery groups the distribution of ≥35% (optimal weight loss, OWL) were 27.5% for RYGB and 15.1% for SG. At 5 years, SWL was seen for 3% in the VLED group, 1.4% in the RYGB group, and 8.4% in the SG group. Self-reported baseline eating behaviors, BED and NE did not affect the weight loss outcome in those followed for 5 years, for either of the treatment modalities. No differences were seen for those with recurrent weight gain (>30%) compared to those maintaining >70% of the maximum weight lost. Among those lost to follow-up at 5 years, higher baseline prevalence of NE, EE, and UE and less percent weight loss at 6 months, 1-, and 2 years, independent of treatment were found, compared to completers.
Conclusion: Several baseline eating behaviors as well as BED and NE did not have negative affect on weight loss outcome in individuals with adherence to follow-up for 5 years. This study indicates that those achieving greater weight loss early in treatment and maintaining weight loss to greater extent, seems more adherent to long term follow-up. Reversibly, higher levels of less favorable baseline eating behavior and prevalence of NE may have negative effect on long term adherence to follow-up.



Proportion of individuals in each weight loss category, distributed by treatment. VLED: very low energy diet; RYGB: Roux-en-Y gastric bypass; SG: sleeve gastrectomy. Suboptimal weight loss (SWL) VLED <5%; Surgery <20%; Moderate weight loss (MWL) VLED 5-<10%; Surgery 25-<35%; Optimal weight loss VLED ≥10%; Surgery ≥35%. Recurrent weight gain >30% regain of maximum weight loss (all treatment modalities).

Fig.1.

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Tab. 1. Percent total weight loss (% TWL) at 6 months, 1-; 2-; and 5 years after start of treatment, for those available for 5-year follow-up, completers, n=507) and those lost to 5-year follow-up (n=420).

		Completers (n=507)				Lost to follow-up (n=420)		
	VLED (n=166)	RYGB (n=222)	SG (n=119)		VLED (n=172)	RYGB (n=166)	SG (n=82)	
	Mean (sd)	Mean (sd)	Mean (sd)	P	Mean (sd)	Mean (sd)	Mean (sd)	P
6 months, %TWL	-18.8 (8.9)a	-26.8 (5.7)	-25.3 (6.7)	<0.05	-16.8 (9.5)c	-26.3 (5.9)	-32.5 (8.9)	<0.05
1 year, %TWL	-16.5 (10.6)a	-32.44 (7.1)	-28.9 (8.6)b	<0.05	-15.1 (9.9)c	-32.0 (7.9)	-27.3 (8.6)c	<0.05
2 years, %TWL	-9.6 (11.9)a	-33.1 (8.1)	-28.6 (9.7)b	<0.05	-8.3 (10.5)c	-32.5 (8.9)	-25.4 (9.4)c	<0.05
5 years, %TWL	-6.5 (14.1)	-28.1 (10.5)	-23.1 (11.6)b	<0.05				

Analyses adjusted for baseline age, BMI, and sex. Multiple analysis adjusted by Bonferroni correction. VLED; very low energy diet, RYGB; Roux-en-y Gastric Bypass, SG; Sleeve Gastrectromy. a Completers: VLED less weight loss compared to both RYGB and SG. b Completers: SG less weight loss at 1-, 2-, and 5 years compared to RYGB. c Lost to follow-up: VLED and SG less weight loss compared to RYGB at all timepoints.

Tab. 2a. Effect of baseline binge eating disorder, nocturnal eating, and history of weight loss and dieting on 5-year weight loss for all, and per treatment modality.

		ALL (n=507)			VLED (n=166)			RYGB (n=222)			SG (n=119)	
	Percent (%)	95% CI	P	Percent (%)	95% CI	P	Percent (%)	95% CI	P	Percent (%)	95% CI	P
Binge-eating disorder (a)	0.2	(-4.9 - 4.6)	0.95	-2.5	(-5.3 – 10.3)	0.53	-2.5	(-4.9 – 9.9)	0.51	9.3	(-19.3 – 0.7)	0.07
Nocturnal eating (b) at least once per month	3.9	(-8.5 – 0.6)	0.09	4.3	(-12.6 – 4.0)	0.31	4.1	(-10.3 – 2.1)	0.2	2.6	(-13.6 – 8.3)	0.64
Losing and regaining ≥10 kg ≥3 times	0.1	(-2.5 – 2.2)	0.92	-0.2	(-3.7 – 4.2)	0.91	0.49	(-4.0 – 3.1)	0.79	-0.1	(-4.9 – 5.1)	0.97
Spent more than half of adulthood (c) dieting	0.5	(-2.9 -2.0)	0.71	1.2	(-5.5 – 3.1)	0.59	0.3	(-3.7 – 3.1)	0.86	-0.2	(-4.7 – 5.1)	0.93

Analyses adjusted for age, sex, and baseline BMI. Results are expressed as mean percent difference and 95% CI. VLED, very low energy diet; RYGB, Roux-en-Y gastric bypass; SG, sleeve gastrectomy. a According to DSM-5. b Wake up from sleep during night to eat c Adulthood = ≥18 years old

Tab. 2b. Effect of baseline emotional eating, uncontrolled eating and cognitive restraint eating on 5-year weight loss, for all, and per treatment modality.

		ALL (n=507)			VLED (n=166)			RYGB (n=222)			SG (n=119)	
	β (effect,%)	95% CI	P	β (effect,%)	95% CI	P	β (effect,%)	95% CI	p	β (effect,%)	95% CI	p
Emotional eating	1.0	(-0.9 -2.1)	0.07	0.5	(-1.3 – 2.3)	0.58	1.2	(-0.5 – 2.8)	0.16	1.5	(-0.9 – 3.8)	0.22
Uncontrolled eating	0.3	(-0.8 – 1.4)	0.59	0.47	(-1.4 – 2.3)	0.62	0.26	(-1.3 – 1.8)	0.74	0.11	(-2.3 – 2.5)	0.93
Cognitive restraint	0.7	(-0.4 – 1.8)	0.14	0.14	(-1.6 – 1.9)	0.88	0.95	(-0.9 – 2.8)	0.31	1.2	(-0.9 – 3.4)	0.26

Analyses adjusted for age, sex, and baseline BMI. Results are expressed as percent (%) per z-score (β-coefficient) and 95% CI. Adjustments according to the Bonferroni correction for multiple tests. VLED, very low energy diet; RYGB, Roux-en-Y gastric bypass; SG, sleeve gastrectomy.

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Tab. 3. Description of baseline binge eating disorder, nocturnal eating, history of weight loss and dieting, eating behaviors and weight loss (% total weight loss, TWL) at 6 months, 1-; 2-; and 5 years after start of treatment.

	Completers (n=507)	Lost to 5-year follow-up (n=420)	P
	Mean %TWL, (sd)	Mean %TWL, (sd)	
6 months	-23.8 (8.0)	-20.9 (9.6)	<0.001
1 year	-26.4 (11.2)	-24.1 (12.1)	<0.05
2 years	-24.7 (14.2)	-21.1 (14.8)	<0.05
5 years	-19.9 (15.3)	.	.
Baseline eating- and weight behavior			
Binge Eating disorder, % (n)	5.7 (27)	8.6 (36)	0.19
Nocturnal eating*, more than once per month, % (n)	6.7 (30)	14.3 (60)	<0.001
Losing and regaining ≥10 kg ≥3 times, % (n)	61.9 (289)	55.8 (251)	0.06
Spent more than half of their adult Life dieting, % (n)	53.0 (236)	48.1 (202)	0.11
Emotional eating, 0–100	42 (28)	48 (29)	<0.001
Uncontrolled eating, 0–100	40 (23)	44 (24)	<0.05
Cognitive restraint eating, 0–100	40 (19)	40 (19)	0.88

Available for 5-year follow-up (completers, n=507) and those lost to follow-up (n=420). All treatments pooled. Analysis adjusted for sex, age, and baseline BMI. Adjusted for multiple analysis by Bonferroni correction.

PO4.146

High Adherence to GLP-1 Receptor Agonists: 18-Month Outcomes from the Yazen Model

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Background: Glucagon-like peptide-1 (GLP-1) receptor agonists and GLP-1/glucose-dependent insulinotropic polypeptide (GIP) receptor agonists have demonstrated efficacy in achieving and maintaining weight loss. However, real-world adherence to these medications beyond the short term remains a concern with previous studies indicating adherence rates between 20-50% after 12 months.

Objective: This study evaluated adherence to GLP-1 receptor agonists at 6, 12, and 18 months in patients receiving these medications within a comprehensive, digitally-delivered weight management program incorporating both medical treatment and intensive lifestyle intervention.

Methods: Data were analyzed from a prospective cohort of Swedish patients (n=25 824) with complete data at the specified time points. The Yazen model combines physician-led medication management with personalized lifestyle coaching delivered by registered nurses, dietitians, or physiotherapists specializing in obesity care. Mandatory psychological support is provided for individuals with dysfunctional eating behaviors or eating disorders. Reasons for treatment discontinuation were captured through patient questionnaires.

Results: Adherence to GLP-1 receptor agonists was 84% at 6 months. Importantly, adherence remained high at 12 months (69%) and 18 months (61%). The primary reason for discontinuation was treatment cost (37%). Side effects and perceived lack of efficacy each accounted for 8% of discontinuations. Unspecified reasons and self-directed weight maintenance attempts comprised 21% and 14% of discontinuations, respectively.

Conclusions: This real-world analysis demonstrates high adherence rates to GLP-1 receptor agonists within a structured, digitally-based weight management program. These findings suggest that integrated lifestyle intervention and readily accessible support from physicians and coaches may contribute to improved long-term medication adherence. Further research is warranted to evaluate the impact of this intervention model on patient outcomes.

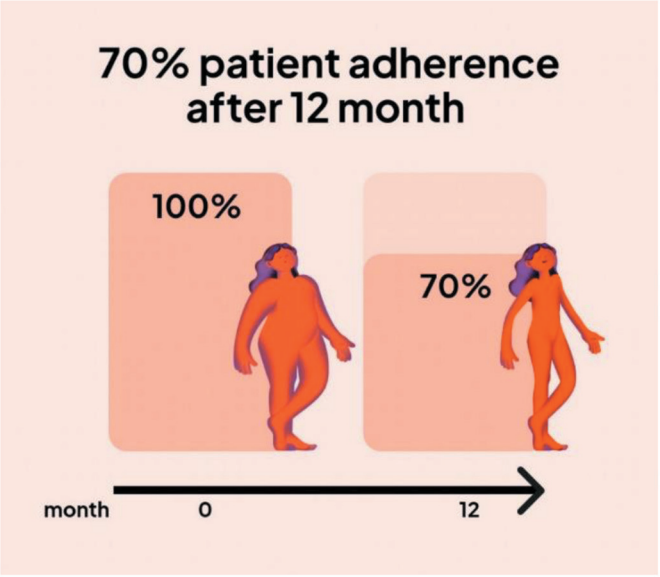


Fig. 1. 1-Year Adherence and Persistence Rates to GLP-1 Medication.

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PO4.147

The Yazen model - Modern obesity treatment given through a digital care model. A descriptive analysis

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Introduction: The Yazen model enables modern obesity treatment, integrating medical treatment, lifestyle intervention and social support. All through a digital platform, enabling continuous, proactive, personal, demand-driven care.
By now, around 25000 patients have received treatment using this model. For inclusion, patients have a BMI of at least 30 kg/m² or ≥ 27 kg/m² with weight-related health problems.
Obesity is a chronic, complex and progressive disease that requires a multifaceted and multidisciplinary treatment approach. Continuous care is recommended for effective, safe and convenient management and should be aligned with individual preferences.
Description: Each patient is assigned a personal physician and a Yazen coach (registered nurse, dietitian, or physiotherapist with obesity expertise) for continuous follow-up.
The doctor utilizes modern anti-obesity medications, tailoring treatment plans to each individual by carefully monitoring their response to the medication, including changes in appetite, hunger and behavior.
The Yazen coach works together with the patient for counseling regarding diet for planning energy deficit, physical activity, motivation and support för behavioral changes.
Patients with dysfunctional eating behaviors or eating disorders receive mandatory support from a psychologist. Others can access psychological counseling if needed to address mental obstacles to weight loss.
Additional support is provided through a structured, educational program called CHANGE, consisting of 8 pedagogical modules addressing obesity, medication, diet, physical activity, and behavioral change. These tools help establish sustainable healthy habits for weightloss, physical and mental health.
The application also contains expert-curated articles for more knowledge and inspiration, food recipes and a community.
The community provides a space to share experiences with other patients, find support, and connect with others on a similar journey, with the option to remain anonymous. The community is also a place where healthcare experts regularly contribute valuable information and inspiration.
Expert counseling from the team together with knowledge and support through the application aim to enhance compliance and promote lasting results.
The overall aim is to have an empowered patient, for sustained weight loss. The patient should have all the insights, and medical treatment, needed to handle the chronic disease.
Once patients achieve a healthy weight, the model helps them to maintain a sustained weight with ongoing medication management and tailored support to address any challenges.
Ongoing research shows high adherence to the treatment model and a mean weight reduction of around 16 % at 12 months.
In summary, the Yazen model goes beyond traditional methods, providing patients with the tools to manage their disease, addressing medical and behavioral aspects, education and social support through a digital platform for accessible, continuous and effective weight loss and management.



Fig. 1. The Yazen Model.

PO4.148

Demonstrating the sufficiency of peripheral CB1 inhibition to promote weight loss using clinical pharmacokinetic (PK) and pharmacodynamic (PD) models

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Background: Cannabinoid receptor 1 (CB1) small molecule inhibitors have been shown to promote weight loss; however, central (brain) CB1 inhibition is also associated with neuropsychiatric adverse events (AEs). Unlike rimonabant, a 1st-generation CB1 inhibitor designed to promote central inhibition via significant brain penetrance, monlunabant, a CB1 inhibitor with improved peripheral restriction, has demonstrated metabolic gains, including weight loss, with less brain exposure in preclinical studies. Recent Ph2 monlunabant clinical data highlighted meaningful weight loss at all doses, yet neuropsychiatric AEs still occurred at increasing amounts of inhibitor. In contrast, nimacimab, an IgG4 CB1 inhibitor, displayed significant efficacy in preclinical studies with near-complete peripheral restriction. Collectively, these data suggest that beneficial metabolic effects may be regulated by peripheral CB1 inhibition alone, yet the role of central CB1 inhibition in promoting weight loss remains unclear.
Objective: To determine the roles (efficacy/safety) of peripheral and central CB1 inhibition by evaluating the relationship between the magnitude of inhibition and exposure to different inhibitors via PK/PD modeling.
Methods: We compared clinical PK profiles of rimonabant, monlunabant, and nimacimab using PK/PD modeling to analyze their target engagement and distribution in the brain and periphery. Published models were used to simulate and analyze clinical trial scenarios with Monolix® (V2023R1) and Phoenix WinNonlin™ (V8.3). CB1 target engagement was modeled by extracting dose-response profiles of pathway inhibition and fitting them into 4-parameter logistic models.
Results: Simulations of rimonabant 5 and 20mg doses demonstrated 90% target engagement (IC90) in the brain with associated neuropsychiatric AEs at both doses. However, unlike the ineffective 5mg dose, the 20 mg dose achieved peripheral IC90, leading to acceptable weight loss. Similarly, modeling of monlunabant 10, 20, and 50mg doses showed a dose-dependent increase in neuropsychiatric AEs associated with increased target

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engagement in the brain. However, notable and nearly equivalent weight loss was observed as target engagement in the periphery exceeded IC90 at all dose levels. Lastly, modeling with a highly peripherally restricted CB1 inhibitor like nimacimab shows that this novel mAb-based CB1 inhibitor readily achieves IC90 in the periphery while being 600-fold below the IC90 in the brain.
Conclusion: Our findings suggest that peripheral CB1 inhibition, rather than central CB1 inhibition, is sufficient to drive weight loss, minimizing the potential for neuropsychiatric AEs associated with central CB1 inhibition. This work supports further development of novel mAb-based CB1 inhibitors with superior peripheral restriction to promote weight loss with reduced centrally mediated neuropsychiatric effects which continues to be a hurdle for the less restricted small molecule inhibitors.

Conflict of Interest: The author is a consultant for Skye Bioscience, a biopharmaceutical company developing therapies for obesity and metabolic diseases.

Funding: Research funded by Skye Bioscience.

PO4.149

The Role of Psychometric Variables in Bariatric Patients: From Diagnostic Assessment to Predictive Value for Surgical Outcomes

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Introduction: Bariatric surgery is a well-established therapeutic option for severe obesity, offering significant benefits in terms of weight loss and comorbidity improvement. However, postoperative outcomes vary considerably among patients, suggesting a critical role for psychological factors. This study aims to explore the impact of psychometric variables, including eating self-efficacy, quality of life, and impulsivity, on surgical outcomes.
Methods: A monocentric, retrospective observational study was conducted on 111 patients who underwent bariatric surgery at the IRCCS Policlinico S. Orsola in Bologna between October 2020 and October 2022. Clinical, psychometric, and laboratory data were collected at baseline and during follow-up at 6, 12, 18, and 24 months. Key psychometric tools included the Eating Self-Efficacy Brief Scale (ESEBS), the Obesity-Related WELL-being questionnaire (ORWELL-97), and the Barratt Impulsiveness Scale (BIS-11). Statistical analyses evaluated the association between these variables and excess weight loss percentage (EWL%).
Results: Preoperative eating self-efficacy initially emerged as a negative predictor of short-term EWL% at 6 months but became a positive predictor at 12 months and beyond, reflecting a progressive adaptation. Postoperative quality of life, assessed using ORWELL-97, was a strong predictor of successful weight loss at 24 months. Impulsivity significantly moderated the impact of previous eating disorders on surgical outcomes, with higher impulsivity correlating with less favorable results between this in this patient population.
Conclusions: This study highlights the critical role of psychometric variables in influencing bariatric surgery outcomes. Eating self-efficacy, quality of life, and impulsivity emerged as key predictors of both short- and long-term success. These findings underscore the importance of integrating psychological assessments and targeted interventions into bariatric care to optimize clinical outcomes and improve patients' overall well-being.

PO4.150

Quantifying the productivity gains of semaglutide treatment in the UK for the population eligible for reimbursement: a modelling study using the wider societal impacts framework

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Background: Obesity and type 2 diabetes (T2D) are complex diseases with wide-ranging impacts for the healthcare system and society. In the UK, NICE recommends medicines based on economic evaluations that consider costs relevant to the NHS and Personal Social Services only. In the reimbursed population, treatment with semaglutide is considered cost-effective from NHS perspective, however, any broader benefits to society are not accounted for. These impacts include paid production, unpaid production (such as volunteering, caregiving and childcare), and consumption. This study aims to quantify these additional societal impacts for Semaglutide treatment for people living with obesity and T2D in the UK.
Methods: The UK Department of Health Wider Societal Impacts Framework was used to estimate net production value as a function of age, sex, health-related quality-of-life (HrQoL) and ICD code. Net production value accounts for an individual's total paid and unpaid productivity, net of their total resource consumption. HrQoL inputs were EQ-5D scores sourced from three Semaglutide clinical trials: STEP 1, SUSTAIN 5 and SUSTAIN 9. Where SF-36 was reported, a published mapping algorithm was used to convert SF-36 to EQ-5D. All HrQoL inputs were age distributed using NICE reference data for the general UK population. Per person net production estimates were calculated by sex and in single years of age. These were aggregated to representative UK reimbursement populations living with obesity and T2D for Semaglutide, according to age and sex distributions estimated based on published literature and data from an observational study using the Discover database.
Results: Semaglutide was estimated to improve annual net production value by an average of £1,127 per person. This includes £327 from paid production (equivalent to avoiding 5 sick days), £736 from unpaid production (equivalent to 12 additional days of activities such as volunteering or childcare), and £64 from reduced consumption.
For the subpopulation living with obesity, improvement in the annual net production value equivalates to £4.31bn, £1.27bn and £2.80bn for total, paid and unpaid productivity gains, respectively. For the subpopulation living with T2D, improvement in the annual net production value equivalates to £0.20bn, £0.04bn and £0.15bn for total, paid and unpaid productivity gains respectively.
For the full reimbursement population net production value gains totalled £4.5bn over the next year with £1.3bn (29%) from paid production and £2.9bn (65%) from unpaid production.
The working age population (18-64yrs) accounted for £3.2bn (72%) of net production gains, of which £1.2bn (37%) came from paid production. Per person, the paid production gains were estimated to be £382, or 6 additional days of paid productivity.
Conclusion: Semaglutide has wider benefits to society, beyond the health benefit measures traditionally valued by HTA organisations, and these should be both recognised and accounted for when evaluating the impacts of new treatment.

PO4.151

The prevalence of blood pressure phenotypes according to different BMI categories: A cross-sectional study

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Background and Objectives: As obesity- induced hypertension seems to be a double trouble, a targeted management of this population seems to be of major importance. The main aim of this study was to examine any

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possible differences of BP phenotypes (dipping status, masked hypertension, MH or white-coat hypertension, WCH) in different BMI categories.
Materials-Methods: The study population consisted of individuals attending the outpatient hypertension clinic. Office and out-of-office BP measurements were recorded in all patients. BMI was categorized based on WHO criteria (group A: BMI <18.5 - underweight, B: BMI 18.5-24.9 - normal weight, C: BMI ≥25.0 – overweight, D BMI ≥30.0 – obesity).
Results: A total of 282 (39.9% men) individuals (56.8±15.8 years) were analysed; 0.4% of the study population was categorised as underweight, 14.9% as normal weight, 38.7% as overweight and 46% as obese. In group A, 100% of the population has dipping status during night as well as normotension. In Group B, 22% presented non dipping status, 42.8% confirmed normotension, 8.9%WCH, 12.2% MH and 36.1% confirmed hypertension. In Group C, 32.5% presented non dipping status, 27.4% confirmed normotension, 14.4% WCH, 15.3% MH and 42.9% confirmed hypertension. In Group D, 35.7% presented non dipping status, 17.1% confirmed normotension, 12.8% WCH, 18.8% MH and 51.3% confirmed hypertension ($p<0.05$ compared to group B for all except WCH).
Conclusions: The prevalence of non-dipping status as well as the prevalence of WCH, MH and confirmed hypertension is getting increased as BMI increases. In patients with overweight and obesity, 29.7% (WCH and MH) and 31.6% will be misdiagnosed without out-of-office BP monitoring. The present findings highlight the importance of out-of-office BP measurements in the diagnosis and treatment of patients with hypertension and overweight or obesity.

PO4.152

Effect of Glycine Supplementation on Low-Grade Inflammation, Cognitive Impairment and Metabolic Function in Older Adults

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Background: Aging is associated with a decline in cognition, physical function, chronic low-grade inflammation, endothelial dysfunction, insulin resistance, and central obesity. Glycine is a non-essential amino acid that plays a crucial role in the synthesis of glutathione, an important endogenous antioxidant in the body. Glycine has been observed to exhibit anti-inflammatory properties and may modulate the immune response, which could also contribute to reducing oxidative stress in the body.
Methods: A prospective and experimental clinical study was conducted with 52 older adults over three months to evaluate the effect of glycine supplementation on cognitive impairment, following the guidelines of the Declaration of Helsinki. Patients were recruited through brochures and interviews, and informed consent was obtained. Body composition, diet, and cognitive function were assessed using the MOCA and MMSE tests. Additionally, blood samples were analyzed for metabolic and hepatic parameters, interleukin-6, TNF-alpha, ROS, glycine, and BDNF using ELISA kits. Each participant received a daily capsule of glycine (1 gram), with strict monitoring of the dosage and supervised administration.
Results: After three months of supplementation with 1 gram of glycine, significant changes were observed in serum glucose levels, liver function tests, and glycated hemoglobin. Proinflammatory interleukin levels decreased, and cognitive test scores improved. Regarding body composition, there was a reduction in weight and body fat percentage, primarily among men. Additionally, participants adopted healthier eating habits, which supported the maintenance of muscle mass.
Conclusion: After three months of supplementation with 1 gram of glycine was well tolerated, decreased inflammation, cognition and body composition. Supplementing GlyNAC in aging humans could be a simple and viable method to promote health and warrants additional investigation.

PO4.153

A Phase IIa Randomized and Double-Blind Study for the Safety, Tolerability, PK/PD and Efficacy of a FIC GPR40/GPR120 Dual Agonist ABP2111Na in Participants with Obesity

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Introduction: ABP2111Na (Tablets) is a novel FIC dual GPR40 (also known as FFAR1) and GPR120 (also known as FFAR4) agonist that had been shown not only significantly to reduce the body weight, NASH, TG, LDL, HbA1c and OGTT in obese rats, but also to have the hypolipidemic and hepatic function-improving effects in preclinical studies. The Phase Ia/IIa studies (CTR20241910/ CTR20243414) had been finished to evaluate the safety, tolerability, PK, PD, food effect, and efficacy of ABP2111Na in participants with obesity or overweight in China. Here we report the clinical results of Phase IIa study with 3 cohorts.
Methods: In this phase IIa randomized, double-blind, placebo-controlled, dose-ascending study, 30 nondiabetic participants (18-60 years old) with a BMI ≥28 kg/m², or 24-28 kg/m² accompanied by at least one weight-related comorbidity were randomized. For 3 cohorts (50, 100, and 200 mg), 10 participants per cohort were randomized 4:1 for ABP2111Na or placebo once daily for 4 weeks. The primary endpoints were safety and tolerability, and the secondary endpoints included PK, PD and efficacy.
Results: 30 participants with obesity or overweight were enrolled in Phase IIa. In blind study, by Dec 20, 2024, only 3 of 30 participants (10.0%) had total 4 cases of possibly drug-related slight gastrointestinal AEs (such as vomiting and diarrhea), and each AE case happened only for few hours and well self-recovered without any treatment. All of possibly drug-related TEAEs were mild as grade 1 in severity, and ABP2111Na was well tolerated with excellent safety for all of 30 participants within 28 days of continuous administration. ABP2111Na showed dose-proportional PK within the dose range, the median Tmax was 1.5-3.0 h and mean T½ was 16.0-24.3 h on day 28 across three of ABP2111Na dose ranges. After 4 weeks, mean changes from baseline body weight and BMI were -1.25% and -1.28% (n=10) in the first 50mg cohort, -3.31% and -3.16% (n=10) in the third 200mg cohort, respectively. Moreover, one participant in cohort 3 was significantly reduced -10.0% of weight and -10.2% of BMI without any drug-related AE within 4 weeks. All of the ALT, AST, ALP, and TBIL tests for 3 cohorts were normal, and the TG, LDL, HbA1c and FBG results showed a descending tendency for hepatic improvement, but did not cause any hypoglycemia.
Conclusion: In this study, ABP2111Na showed excellent safety, favorable PKs/PDs and significant reduction of participants with obesity or overweight. These finding supports further clinical exploration of ABP2111Na in participants with metabolic syndromes, and it has been ongoing for ABP2111Na to carry out the Phase IIb trials to further verify the efficacy and improvements in hepatic function in 180 participants with obesity or overweight from Jan. to July, 2025 in China, and Phase I/II in USA later in 2025, respectively.

Conflict of Interest: None Disclosed.

Funding: NO Funding to report.

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PO4.154

Magnetic resonance delivers insight into the changes of muscle, liver and adipose tissue metabolism of sedentary middle-aged individuals with obesity provided by 3-month complex lifestyle intervention

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Introduction: Magnetic resonance imaging (MRI) and spectroscopy (MRS) provide clinically relevant insight in the lifestyle intervention-related changes in concentration of key metabolic substrates in adipose tissue, liver and skeletal muscle and their dynamic regulation of the key metabolic substrates during submaximal exercise. Here we use MR techniques to provide a comprehensive integrated multi-organ insight into the changes of exercise-related energy metabolism elicited by 3-months lifestyle intervention in patients with obesity.
Methods: Fifty-one middle-aged individuals with obesity were randomized into intervention (n=36, age 36.0±6.1, BMI 34.0±4.0kg/m2, 20F/16M) and control (n=15, age 34.0±7.0, BMI 34.0±4.0 kg/m2, 10F/5M) groups. 3-months lifestyle intervention included supervised aerobic/strength exercise (3x per week), weekly nutritional and monthly psychological counselling. MR examinations were performed before and after 3-months intervention. Liver and adipose tissues were examined using 3T MR system (Siemens Healthineers). Hepatic lipid accumulation was measured by localized 1H MRS, volume of visceral (VAT) and subcutaneous (SAT) adipose tissues with a T1-weighted fast spin echo and concentration of mono and poly- unsaturated fatty acids in deep SAT, superficial SAT and VAT with single-voxel MRS STEAM technique. Gastrocnemius muscle MRS was performed using 7T human MR system (Siemens Healthineers) and MR-compatible ergometer. Volunteers were lying in supine position with right calf muscle placed on RF coil while exercising at 30% MVC force (plantar flexion). 1H MRS detected concentrations of acetylcarntine, carnosine, intramyocellular lipids (IMCL), and creatine while 31P MRS yielded phosphorus signals of ATP, NAD, phosphodiesters, inorganic phosphate and phosphomonoesters. The dynamic 31P-MRS protocol allows was used to examine depletion of PCr during 6 min. of submaximal exercise (VPCr) and the rate of PCr resynthesis during 6 min. recovery (TPCr), and the rate of oxidative phosphorylation, i.e., capacity to regenerate ATP(Qmax), and the time-course of the intracellular pH changes during and post-exercise.
Results: 3 months lifestyle intervention lowered Hepatic lipids (p=0.01), increased levels of unsaturated fatty acids in VAT depots (p=0.004), reduced visceral adiposity (p= 0.04) and deposition of intramyocellular lipids in gastrocnemius muscle (p= 0.001). Moreover, intervention increased functional capacity of muscle mitochondria to generate ATP as evidenced by higher Qmax (p= 0.02) and lower τTPCr (p= 0.01).
Conclusion: This study provides a comprehensive multi-organ non-invasive MR based examination of energy metabolism in patients with obesity highlighting effects of the 3-months complex lifestyle intervention. The combination of MRI/MRS provides insight into the dynamic changes of muscle and liver metabolism in response to acute exercise bout and as a result of the adaptive response to lifestyle intervention.

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PO4.155

The impact of BMI on placebo response in patient-reported symptoms and functional tests in a knee osteoarthritis trial

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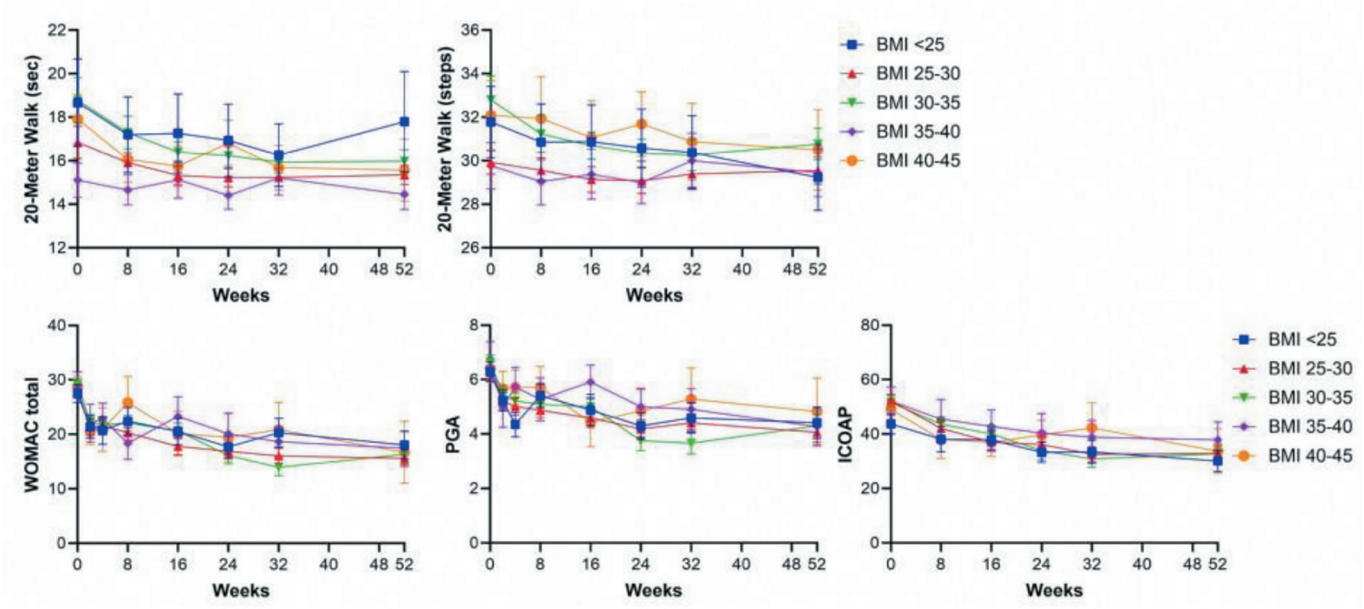
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Introduction: Recent advancements in weight-loss-inducing agents have shown indications of improvements in con-ditions such as knee osteoarthritis (OA) and rheumatoid arthritis in persons with obesity. However, the sensitivity and dynamics of functional tests, such as the 20-meter walking test, and patient-reported outcome measures (PROMs) in persons with obesity and OA remain inadequately explored. This exploratory post-hoc analysis evaluates the efficacy of intra-articular placebo injections and the potential influence of BMI on the changes observed in the 20-meter walk-ing test and commonly used PROMs.
Methods: This is a post-hoc analysis of a randomized, placebo-controlled, double-blind Phase II study comparing intra-articular injections of SB-061 with placebo (isotonic saline) over 52 weeks[1].
A total of 288 subjects were randomized to SB-061 (n = 145) or placebo (n = 143), with 252 participants (87.5%) completing all injections. This subgroup analysis focuses on participants in the placebo group, examining the influence of baseline BMI on the 20-meter walking test, as well as perceived pain and functionality using WOMAC, Intermittent and Constant Osteoarthritis Pain (ICOAP), and Patient Global Assessment (PGA) scores. Placebo participants were stratified into BMI subgroups (<25, 25–30, 30–35, 35–40, and 40–45). One subject with a BMI <20 was excluded from the analysis. Statistical analyses were conducted using a mixed-effects model with Dunnett correction at each time point (Weeks 0, 8, 16, 24, 32, and 52)
Results: Baseline characteristics across BMI subgroups were comparable on age, KL-score and with no significant differences in any of the main analysis parameters. Greater variability was observed in the 20-meter walking test compared to PROMs assessing pain, stiffness, and functionality, as measured by WOMAC, PGA, and ICOAP scores (Figure 1). After 52 weeks of intervention, significant reductions in duration and step count for the 20-meter walking test were observed in BMI ranges 30–35 ($p < 0.0001$, $p = 0.004$) and 40–45 ($p = 0.0014$, $p = 0.36$), respectively, compared to baseline. Similarly, PROMs demonstrated significant reductions across all BMI ranges, except for near-significant reductions in WOMAC, PGA, and ICOAP for BMI 40–45 and ICOAP for BMI 35–40 (Table 1).
Conclusion: Placebo injections improved the 20-meter walking test and PROMs, including WOMAC, ICOAP, and PGA scores, but the degree of improvement varied across BMI categories. PROMs appeared to be more sensitive to placebo injections across BMI ranges compared to functional performance metrics, like the 20-meter walking test. These findings could suggest that BMI may act as a confounding factor in evaluating the 20-meter walking test and, to a lesser extent, the PROMs for knee osteoarthritis, but will require further investigation to be confirmed.
[1]Bihlet, A. R. et al. A phase 2b double-blind placebo-controlled randomized clinical trial of SB-061, an aggrecan mimetic, in patients with symptomatic knee osteoarthritis. Osteoarthritis and Cartilage 32, 1471–1480 (2024).

Conflict of Interest: None

Funding: The study was sponsored by Nordic Bioscience A/S, Denmark.

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Effects of 52 weeks of placebo injections across BMI subgroups (<25, 25–30, 30–35, 35–40, and 40–45) on the 20-meter walking test and patient-reported outcome measures (PROMs) for pain, stiffness, and functionality. Data are expressed as means ± SEM.

Fig. 1. Placebo response in individuals with symptomatic knee osteoarthritis.

Tab. 1. Changes from baseline in functional performance and patient-reported outcome measures.

Table 1	BMI <25 N=18	BMI 25-30 N=52	BMI 30-35 N=48	BMI 35-40 N=13	BMI 40-45 N=11
Walking test (sec) Change from baseline					
Mean	-0.87	-1.49	-2.80	-0.66	-2.34
95% CI	-3.99 to 2.24	-3.03 to 0.05	-3.83 to -1.78	-1.79 to 0.48	-4.08 to -0.59
Walking test (steps) Change from baseline					
Mean	-2.53	-0.38	-2.03	-0.31	-1.60
95% CI	-5.27 to 0.18	-1.66 to 0.79	-3.26 to -0.80	-1.49 to 0.87	-3.67 to 0.49
WOMAC total (0-100) Change from baseline					
Mean	-9.41	-12.03	-12.70	-11.63	-12.03
95% CI	-16.18 to -2.77	-16.33 to -7.73	-17.90 to -7.50	-21.43 to -1.83	-24.89 to 0.82
PGA (0-10) Change from baseline					
Mean	-1.88	-2.2	-2.3	-2.48	-1.57
95% CI	-3.02 to -0.74	-3.16 to -1.23	-3.76 to -0.99	-4.69 to -0.26	-4.64 to 1.51
ICOAP (0-100) Change from baseline					
Mean	-13.64	-19.39	-18.87	-14.27	-15.38
95% CI	-19.82 to -7.40	-27.75 to -11.03	-29.28 to -8.46	-33.27 to 4.72	-32.92 to 2.16

The table presents the mean changes in functional performance and PROMs from week 0 to week 52. Statistical analyses were conducted using a mixed-effects model with Dunnett correction for comparisons at each time point (Weeks 0, 8, 16, 24, 32, and 52). Results are reported with 95% confidence intervals (CIs)

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PO4.156

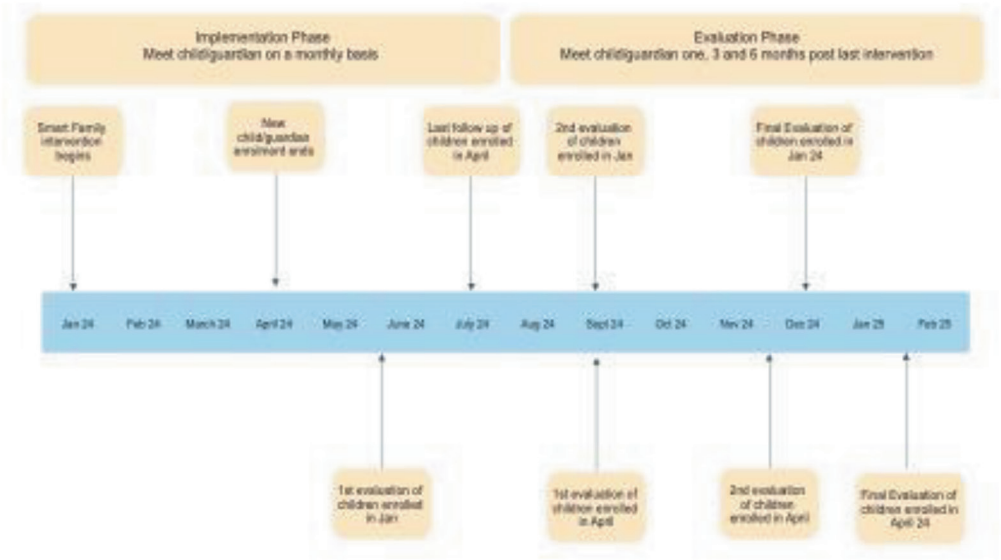
Assessing the acceptability of a New Methodology for Childhood Obesity Prevention Through Tailored Interventions: Findings from Health4Eukids, a European Joint Action

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Background: Obesity is a globally recognized public health problem that is, however, still treated using an individualistic approach[1], with the effectiveness of such interventions being highly dependent on adherence. Weight loss, however, is usually regained following such interventions since most are not sustainable and aim for short-term results and not for life-long changes. For this reason, we implemented Health4EUKids, a European Joint Action Program, aiming to pilot study the acceptability of the "Smart Family," a new lifestyle counselling methodology. We selected the area of Patras, Greece, due to the high burden of obesity and the pronounced socioeconomic inequalities.

Methods: We engaged and trained a total of 48 health care professionals who expressed interest, including pediatricians, dietitians, social counsellors, and nurse practitioners. Training was performed through two 2-hour online sessions, and we ran the intervention program for a year in total, including 4 one-30-minute sessions per month. All families were included, irrespective of children's weight status, and all actions of the interventions were based on the Smart Family Health Card (containing 15 questions) that trained practitioners asked each family to complete and select behaviours they felt they needed and were ready to address. Families were asked to complete the Health Care Climate Questionnaire (HCCQ) and the Perceived Competence Questionnaire (PCS) in complete confidentiality at the end of the intervention, using a scale from 1 to 7, with 1 indicating not at all true, 4 somewhat true, and 7 very true.



Methodology of the intervention with specific timepoints presented.

Fig. 1. Smart Family Implementation Timeframe.

Tab. 1. Family evaluation results on their experience with the new counseling method with their pratitioner (HCCQ) and their acquired competence (PCS).

HCCQ (Healthy Diet)	Mean (sd)
I feel that my health-care practitioners have provided me with choices and options about changing my diet (including not changing)	6.8 (0.6)
I feel my health-care providers understand how I see things with respect to my diet	6.9 (0.3)
My health-care providers convey confidence in my ability to make changes regarding my diet	6.9 (0.5)
My health care practitioners listen to how I would like to do things regarding my diet.	6.9 (0.3)
My health-care practitioners encourage me to ask questions about my diet.	6.9 (0.3)
My health-care practitioners try to understand how I see my diet before suggesting any changes.	6.9 (0.3)
PCS (Perceived Competence)	Median (sd; range)
I feel confident in my ability to maintain a healthy diet	6 (1; 4-7)
I now feel capable of maintaining a healthy diet	6 (1; 4-7)
I am able to maintain a healthy diet permanently	5.1 (1.9; 1-7)
I am able to meet the challenge of maintaining a healthy diet.	5.5 (1.1; 4-7)

Despriptive results of each question depicted as mean (standard deviation) for normally distributed variables and median (range) for skewed); sd: standard deviation

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We used these to evaluate families experience of the new counselling method employed by the practitioners.
Results: Out of the 48 health care professionals we trained, 14 actively participated (29%) in using the new methodology, and they enrolled 60 families (66 children), and 14 families completed all 4 sessions of the pilot study at this stage and responded to both questionnaires. Overall the health care professionals were highly rated with a median of 6.9 (HCCQ range: 5 to 7). The highest variability was for options provided and confidence conveyed on parent abilities by the practitioner. The PCS scores were also high, although lower than the HCCQ, with a median between 5.1 and 6 and a higher distribution variability. We observed that the largest variability was in responses related to maintaining a healthy diet long-term.
Conclusion: Our study findings show great promise in persuading families in their ability to achieve healthy behavioural changes using the Smart Family methodology, a positive development that starts with the health care professional. However, an emphasis should be given on providing more options and conveying greater confidence in order for the families to feel that the changes can be sustainable.

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PO4.157

Regional Disparities of Obesity Determinants Across Mexican Municipalities: A Multiscale Geographically Weighted Regression Analysis Incorporating Satellite-Derived Data

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Introduction: Obesity rates continue to rise worldwide, and Mexico has one of the highest prevalence rates. This study focuses on adults aged 20 and older with obesity as the outcome variable. The predictors include the urban proportion of Gross Domestic Product (GDP), derived from nighttime light data, population in poverty, distance to the United States border, population deprived due to educational backwardness, population lacking access to food, the aging index, and the Normalized Difference Vegetation Index (NDVI). These variables were chosen to capture socioeconomic conditions, demographic characteristics, and environmental factors that may be linked to obesity prevalence across 2,246 Mexican municipalities.
Methods: Ordinary Least Squares (OLS) regression typically assumes that every predictor has the same effect across all locations, overlooking the possibility of regional differences. To address this limitation, this study employs a Multiscale Geographically Weighted Regression (MGWR) framework that accounts for varying scales of influence on obesity. Some predictors may operate at broad, country-wide scales, while others vary locally or regionally.
Results: The study identifies distinct geographical clusters of obesity and their underlying predictors. Municipalities closer to the U.S. border exhibit higher prevalence rates. Furthermore, the influences of poverty, the urban proportion of GDP, educational backwardness, food insecurity, the aging index, and NDVI on obesity vary at local and regional scales rather than remaining uniform across Mexico.
Conclusion: MGWR offers a stronger alternative to OLS for understanding obesity in Mexico, providing a nuanced perspective on how various local and regional factors shape obesity across the country's municipalities and helping monitor and guide targeted public policy design.

PO4.158

Weight maintenance after treatment of obesity with mobile health behaviour change support system: 18-month results of a randomized trial

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Introduction: Even though electronic health weight loss interventions have shown promising results, there is large knowledge gap regarding the long-term effectiveness of these interventions, creating uncertainty to the implementation of these solutions in practice. In this study, we investigated whether the weight loss achieved by a stand-alone mobile health behaviour change support system (mHBCSS) is maintained after the end of the intervention. In addition, changes in cardiometabolic risk factors were investigated.
Methods: In this phase of the randomized controlled trial, 200 volunteers (aged 18-65 years and BMI 30-40 kg/m²), who were earlier randomised to two groups (immediate access to mHBCSS and wait-list control group), were followed until 18 months. The group with immediate access to mHBCSS had earlier used the mHBCSS for an active phase of 6-months and remained access to mHBCSS for another 6-months period before the follow-up period lasting until the 18-month time point. Wait-list control group received the same mHBCSS intervention after 6-months. The participants' anthropometric and metabolic traits were measured. The primary outcome was weight loss at the 18-month time point.
Results: The trial population consisted of 200 participants (88.5% women) with mean BMI of 34.3 kg/m² (2.8) and mean age 46.5 years (9.5). After 18 months, the retention rate was 79 % (n=158). The group with immediate access to mHBCSS had partially maintained the weight loss achieved by the mHBCSS (-1.4% 95% CI -2.4 to -0.4, p = 0.01 at 18-month time point vs. -2.5%, 95% CI –3.4 to –1.6, p <0.001 at the 6-month time point). Almost a fifth of the group with immediate access to mHBCSS had achieved the weight loss of 5% or more at the 18-month time point while one third of the group had gained weight. Significant differences on baseline characteristics were not found between those succeeding to lose ≥5% of their weight and those who did not. In the group with immediate access to mHBCSS, statistically significant differences were observed in both systolic and diastolic blood pressure and in low-density-lipoprotein levels but not in glucose levels at the 18-month time point in comparison with baseline.
Conclusion: The use of mHBCSS results in longer-term weight loss without any face-to-face or other human counselling included. Further research is needed to identify the patients for whom this treatment requiring minimal resources is sufficient in itself and those who would benefit from additional counselling or combination with other treatment modalities.

PO4.159

Weight Reduction and Measures of Obstructive Sleep Apnoea by Sex from SURMOUNT-OSA: post-hoc analyses

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Introduction: In the phase 3 SURMOUNT-OSA studies (NCT05412004), tirzepatide (TZP), a once-weekly dual GIP/GLP-1 receptor agonist, significantly reduced the apnoea–hypopnoea index (AHI) and body weight (BW) versus placebo (PBO) in adults with moderate-to-severe obstructive

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		Study 1			Study 2		
End point	**Treatment**	Males n=78	Females n=36	Test for Interaction †	Males n=87	Females n=33	Test for Interaction †
Change in AHI (SE) — no. of events/h	TZP	-30.6 (2.59)	-19.8 (3.86)	P=0.512	-32.6 (2.48)	-24.8 (3.24)	P=0.717
	PBO	-6.6 (2.85)	-1.1 (3.90)		-7.5 (2.78)	-1.8 (3.49)	
	Estimated Treatment Difference (95% CI)	-23.9 (-31.6, -16.3)	-18.8 (-29.9, -7.6)		-25.1 (-32.6, -17.7)	-23.1 (-32.6, -13.5)	
	P-value‡	<.001	=0.001		<.001	<.001	
% change in AHI (SE)	TZP	-56.2 (4.68)	-51.5 (10.18)	P=0.461	-61.2 (5.39)	-66.8 (10.51)	P=0.428
	PBO	-9.5 (5.16)	3.8 (10.32)		-8.2 (6.07)	-2.0 (11.33)	
	Estimated Treatment Difference (95% CI)	-46.7 (-60.5, -32.9)	-55.3 (-84.6, -25.9)		-52.9 (-69.1, -36.8)	-64.8 (-95.8, -33.7)	
	P-value‡	<.001	<.001		<.001	<.001	
Reduction of ≥50% in AHI events at wk 52 — no. (%)	TZP	41 (61.19)	22 (75.86)		58 (76.32)	22 (75.86)	
	PBO	10 (18.52)	5 (17.86)		13 (22.41)	7 (28.00)	
	Odds Ratio (95% CI)	6.26 (2.78, 14.09)	11.04 (2.92, 41.78)		9.50 (4.34, 20.78)	7.84 (2.32, 26.52)	
	P-value‡	<0.001	<0.001		<0.001	<0.001	
AHI of <5 or AHI of 5 to 14 with ESS ≤10 at wk 52 — no. (%)	TZP	26 (38.81)	13 (44.83)		35 (46.05)	19 (65.52)	
	PBO	5 (9.26)	6 (21.43)		6 (10.34)	5 (20.00)	
	Odds Ratio (95% CI)	8.49 (2.70, 26.65)	9.30 (2.08, 41.61)		7.10 (2.64, 19.06)	9.21 (2.41, 35.20)	
	P-value‡	<0.001	=0.004		<0.001	=0.001	
% change in SASHB at wk 52 (SE)	TZP	-69.5 (3.19)	-63.6 (5.47)	P=0.547	-76.5 (3.25)	-76.5 (4.39)	P=0.602
	PBO	-14.1 (9.89)	-12.1 (13.45)		-34.7 (10.10)	-19.8 (16.01)	
	Estimated Treatment Difference (95% CI)	-64.5 (-73.9, -51.7)	-58.6 (-73.1, -36.2)		-64.0 (-76.1, -45.7)	-70.7 (-83.1, -49.2)	
	P-value‡	<.001	<.001		<.001	<.001	
Change in body weight (SE) — kg	TZP	-22.9 (1.11)	-17.2 (1.60)	P=0.028	-22.7 (1.20)	-24.8 (1.44)	P=0.211
	PBO	-1.1 (1.18)	-1.7 (1.58)		-3.1 (1.29)	-1.3 (1.50)	
	Estimated Treatment Difference (95% CI)	-21.8 (-25.0, -18.6)	-15.5 (-20.0, -11.0)		-19.6 (-23.0, -16.1)	-23.5 (-27.7, -19.4)	
	P-value‡	<.001	<.001		<.001	<.001	
% change in body weight (SE)	TZP	-19.0 (0.80)	-16.3 (1.39)	P=0.171	-18.9 (0.87)	-23.1 (1.23)	P=0.034
	PBO	-1.2 (0.85)	-1.6 (1.37)		-2.5 (0.95)	-1.7 (1.29)	
	Estimated Treatment Difference (95% CI)	-17.7 (-20.1, -15.4)	-14.6 (-18.5, -10.7)		-16.4 (-18.9, -13.8)	-21.4 (-25.0, -17.9)	
	P-value‡	<.001	<.001		<.001	<.001	
Change BMI (SE) — kg/m^2	TZP	-7.3 (0.34)	-6.5 (0.61)	P=0.321	-7.2 (0.37)	-9.3 (0.52)	P=0.010
	PBO	-0.4 (0.36)	-0.6 (0.60)		-1.0 (0.40)	-0.6 (0.54)	
	Estimated Treatment Difference (95% CI)	-6.9 (-7.9, -5.9)	-6.0 (-7.7, -4.3)		-6.2 (-7.3, -5.1)	-8.8 (-10.3, -7.3)	
	P-value‡	<.001	<.001		<.001	<.001	

Data are least-squares means with standard error (SE) or numbers and percent of patients, unless otherwise stated. All changes are from baseline to week 52. Differences between TZP and PBO are presented as estimated treatment differences except for the week-52 categories of reduction of ≥50% in AHI events and AHI of <5 or 5 to 14 with ESS ≤10, which are shown as odds ratios. Estimated treatment differences are the differences in the least-squares mean changes. The least-square mean change from baseline was calculated within each sex group using a mixed model for repeated measurements (MMRM) with Baseline value, Geographic Region, Baseline OSA Severity Group, Sex, Treatment, Time, and Treatment*Time as the fixed effect and patient as random effect. A full MMRM model with sex and interaction terms provided the p-value for comparing treatment effects by sex at specific time intervals. Odds ratios were calculated from a logistic regression with baseline value, geographic region, and treatment as covariates, where missing data at week 52 were imputed using multiple imputation in each treatment arm assuming missing at random. Efficacy analyses were conducted in all randomised participants who received ≥1 treatment dose. Data obtained after discontinuation of study intervention or initiation of PAP therapy (study 1 only) were excluded from analysis. ‡ P-value corresponds to the estimated treatment difference between TZP and PBO arms. †Treatment*Sex at Week 52

Fig.1.

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sleep apnoea (OSA) and obesity. Males and post-menopausal females not on hormone replacement therapy are at a higher risk of OSA; females tend to have greater weight reduction with incretin-based therapy compared to males. Thus, we hypothesized a sex-dependent response to TZP for weight reduction and OSA measures in SURMOUNT-OSA and herein report post hoc analyses of these measures by sex.

Methods: We used data from two phase 3 randomized, double-blind studies that evaluated the efficacy and safety of the maximum tolerated dose of weekly TZP (10 mg or 15 mg) in adults with moderate-to-severe OSA (AHI ≥15 events/h) and obesity (BMI ≥30 kg/m2). Study 1 (N=234) included participants unable/unwilling to use positive airway pressure (PAP) therapy, and study 2 (N=235) included those on PAP therapy. The analysis set included all randomised participants who received ≥1 treatment dose, excluding data after treatment discontinuation and/or after starting PAP therapy for study 1. The least-square mean change from baseline for measures of OSA and BW reduction was calculated within each sex group using a MMRM with adjusted covariates.

Results: In total, 234 participants were randomly assigned to TZP: 114 in study 1 and 120 in study 2. At baseline, in both studies, severe OSA was more common in males, who also had lower mean BMI and higher mean total hypoxic burden. In study 2, males were younger, had higher mean BW and higher mean AHI. In study 1, at week 52, the PBO-adjusted treatment effect on AHI for males and females was -23.9 vs -18.8 events/h; the % change difference in AHI was -46.7 vs -55.3; the % change difference in the sleep apnoea–specific hypoxic burden (SASHB) was -64.5 vs -58.6; the % change difference in BW was -17.7 vs -14.6; and the change difference in BMI was -6.9 vs -6.0 kg/m2, with no significant differences observed between sexes. There was a greater reduction in the change difference in BW in males (-21.8 vs -15.5 kg; P<0.05). In study 2, at week 52, the PBO-adjusted treatment effect on AHI for males and females was -25.1 vs -23.1 events/h; the % change difference in AHI was -52.9 vs -64.8; the % change difference in SASHB was -64.0 vs -70.7; and the change difference in BW was -19.6 vs -23.5 kg; with no significant differences observed between sexes. There were greater reductions for females in the % change difference in BW (-21.4 vs -16.4) and the change difference in BMI (-8.8 vs -6.2 kg/m2), both P<0.05.

Conclusion: In post hoc analyses, across studies, males and females on TZP had significant reductions in AHI, SASHB, and BW versus PBO. Differences in BW reduction between sexes did not translate into significant differences in changes in AHI and SASHB. This is one of the first reports of greater BW reduction in males in a randomized clinical study with incretin therapy. This population included participants not on PAP therapy and warrants further investigation.

PO4.160

Protein supplementation is more important for women than for men to achieve the minimum protein intake in the first month after bariatric surgery

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Introduction: An early initiation of protein supplementation is one of the most important tools to achieve the minimum protein intake of 60 grams per day after bariatric surgery. Therefore, supplementation with 30 g of whey protein is recommended for all patients undergoing bariatric surgery. The aim of the study was to analyze the impact of protein supplementation on total protein intake after bariatric surgery, specifically studying possible differences according to sex.

Methods: A total of 216 patients (72% females) with a mean age of 46.8 ± 12.8 years undergoing bariatric surgery [84 (39%) sleeve gastrectomy and 132 (61%) Roux-en-Y gastric bypass] between 2020 and 2023 at the Clínica Universidad de Navarra (Pamplona, Spain) were included in the study. Independent samples T-tests and two-way ANOVA were used to analyze total protein intake and protein supplementation in both sexes at 1, 3, 6 and 12 months post-surgery.

Results: The percentage of patients in whom protein supplementation intake is accomplished decreases over the follow-ups (96%, 70%, 33% and 11% at 1, 3, 6 and 12 months, respectively). Patients who adhered to supplementation ingested significantly more protein expressed in grams per day at month 1 (71±10 vs. 62±29), 3 (74±14 vs. 65±18) and 6 (77±19 vs. 71±15). Men ingested significantly more protein than women at all follow-ups. Two-way ANOVA showed a strong interaction between sex and protein supplementation at month 1 (p =0.02) and 3 (p=0.04). In the subgroup of women, those who took supplementation had a significantly higher protein intake at months 1 (70±9 vs. 49±9), 3 (71±12 vs. 64±18) and 6 (78±12 vs. 67±13). However, in the group of men, no significant differences in protein intake were found between those who adhered to supplementation and those who did not.

Conclusion: Protein supplementation helps to achieve the minimum protein intake after bariatric surgery. While men who did not adhere to the supplement exceeded the minimum recommended intake during all follow-ups, supplementation is essential for women to achieve this goal in month 1 after bariatric surgery.

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PO4.161

Clinical and preclinical relevance of postbiotic pA1c®HI in obesity management

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Introduction and Objective: Postbiotics, which are inactivated probiotics, have emerged as a promising alternative due to their stability at high temperatures, bioactivity, and potential as food ingredients. However, very few postbiotics have demonstrated efficacy in lipid regulation against obesity. Therefore, this review focuses on evaluating the preliminary mechanism of pA1c®HI on lipid biochemical parameters in the context of obesity management.
Methods: The study compiles results in preclinical and clinical models to assess the effectiveness of pA1c®HI on lipid metabolism and obesity control. A preclinical *in vivo C. elegans* model, alongside murine models fed a high-fat diet to mimic obese conditions *vs* control were used and anthropometric measurements, gene expression, hormones and metagenomic analyses were performed. Additionally, a pilot clinical trial was conducted in 17 individuals with obesity, where participants received pA1c®HI supplementation for 12 weeks *vs* placebo. Total weight, body mass index (BMI), fat mass, visceral fat, lean mass, diastolic blood pressure (DBP) and gastrointestinal symptoms questionnaires were measured.
Results: In *C. elegans*, pA1c®HI significantly reduces fat storage (-21.2±5.0% *vs* control) and the magnitude of the reduction in the lipid content was similar ($p \geq 0.05$) to the anti-obesity drug Orlistat. Moreover, the postbiotic significantly upregulated *cpt-2* and *acox-1* genes by 50%, promoting β-oxidation and decreased the expression of *fat-5* by 50%, a gene involved in *de novo* lipogenesis.
In the murine model, pA1c®HI supplementation also reduces total weight (-40.0±16.8%), weight gain (-30.0±10.3%) and food intake (-10.0±4.2%) by reducing the expression of key genes involved in lipid metabolism, including *Ppar-γ* (key regulator of adipogenesis) and *CD36* (involved in the uptake of fatty acids into adipocytes). Additionally, pA1c®HI significantly stimulated GLP-1 and inhibited leptin secretion, hormones that regulate appetite and satiety, which help control food intake and weight. These improvements, combined with its ability to enhance gut microbiota composition by decreasing significantly obesity-related bacteria, highlight the multifactorial nature of pA1c®HI's action in obesity management.
Furthermore, the pilot clinical trial in individuals with obesity, evidences that supplementation with pA1c®HI led to clinically relevant reductions *vs* placebo in body weight (-1.3%), BMI (-0.51 points), visceral fat (-0.9%) and fat mass (-1.6%) and an increase in lean mass (+0.9%) after just 12 weeks, along with improvements in gastrointestinal symptoms (-21.2%) and DBP (-8.8 mmHg; $p = 0.029$).
Conclusion: The postbiotic pA1c®HI supplementation reduces fat accumulation, BMI, fat mass, and increases lean mass. The modulation of lipid metabolism-related genes, enhanced GLP-1 secretion, inhibited leptin and microbiota modulation are implicated in the mechanism of action. These findings suggest its potential as a novel alternative for the nutritional management of obesity and improving lipid metabolic health.

PO4.163

Digital weight management care with semaglutide: real-world evidence from 1666 UK NHS patients with obesity

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Introduction: In England, reimbursed access to weight loss medications is available for people with severe obesity only through specialised multidisciplinary weight management services. Digital technologies for such services can enable broader, remote access. Real-world data from a digital service provider on patient baseline characteristics and treatment outcomes is presented.
Methods: Provider data (n=1666; F=1361; M=305) from participants with severe obesity (mean BMI: 46.91 kg/m2, SD: 8.69) entering a multidisciplinary service with semaglutide were extracted.
Results: Outcomes: At 3 months (n=1109) participants lost 4.39% (SD: 4.18) of initial weight; at 6 months (n=414) they lost 8.53% (SD: 6.26).
Ethnicity (n=1435): The majority of participants were white Irish/British (68%, n=1184).
Socio-economic status/IMD (n=1617): 22% (n=374) were inhabitants of the most economically deprived areas (IMD=1-2). Employment status: 41% full-time, 18% part-time, 13% unemployed.
Blood pressure (n=1158): Mean systolic: 131.73 mm Hg (14.97); diastolic: 82.20 mm Hg (9.91), indicating elevated levels.
HbA1c (n=840): Mean: 40 mmol/mol (10); adults above 50 years old and men reported 50 mmol/mol (10), suggesting diabetes.
Quality of life (EQ-5D, n=1495): Participants reported a mean score of 36.93 (23.84), out of a maximum of 100 (best health), implying a significant impact of participants' weight and weight-related conditions on their perceived quality of life.
Depression (PHQ-9, n=853): Participants reported a mean of 6.46 (5.52) - mild depression symptoms. Severity: 24% (n=408) mild, 14% (n=225) moderate, 10% moderately severe (n=160), 3% (n=54) severe.
Binge eating (BED-7, n=1331): 29% (n=478) received 9-14 points and were triaged into further support from the psychotherapists. Mean: 6.23 (4.46); 63% reported binge episodes in the last 3 months. 29% (n=478) received 9-14 points and were triaged into further support from the psychotherapists.
Disabilities (n=489): 29% had disabilities; 13% reported multiple. Most common were mobility/gross motor (20%) and behavioral/emotional issues (8%).
Self-efficacy (n=1587): Participants assessed their confidence regarding abilities to self-manage their weight and weight-related conditions (score 1 to 10, 10 being very confident). Median value was 5.00 (IQR: 3.00-6.50). 11% of participants (n=178) scored the lowest possible result (1).
Health goals (n=1315): For 76% (n=1272) losing weight was the primary health goal. 64% (n=1062) wanted to feel healthier, 54% (n=894) prevent further health problems, 33% (n=547) improve their physical activity, 32% (n=533) their eating habits.
Conclusion: Preliminary results indicate that participants in this digital intervention with weight loss medications achieved comparable outcomes as in clinical trials. Baseline data demonstrates that participants are living with multiple physical and psychological comorbidities, testifying to their urgent need for accessible, reimbursed support; especially for those from the lowest socioeconomic centiles or who are unemployed.

PO4.164

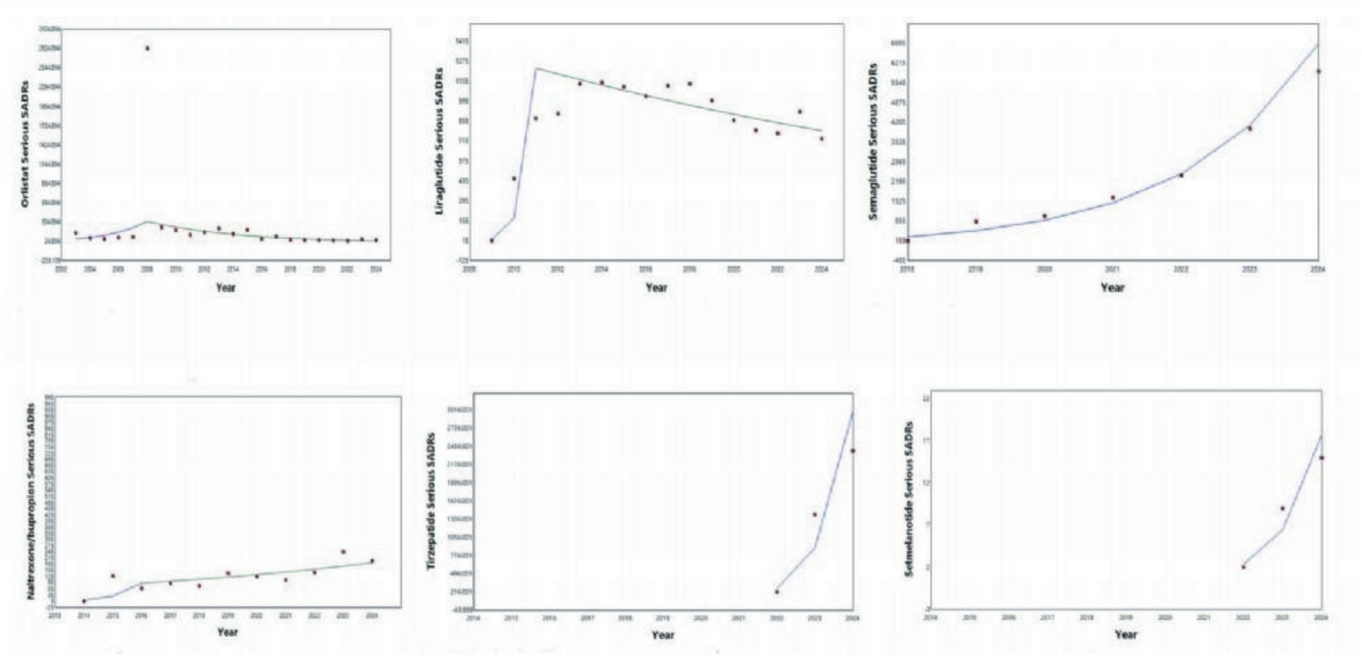
Assessment of Trends in Reporting Serious Adverse Events Linked to Anti-Obesity Medicines

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Background: The growing use of anti-obesity medicines has raised concerns regarding their safety, particularly in relation to severe side effects. As these treatments are increasingly prescribed, the need for vigilant monitoring of their adverse events becomes paramount.
Objective: This study aimed to analyze trends in the reporting of adverse events linked to anti-obesity medicines approved for use in the European Union, with the goal of identifying potential discrepancies in their safety profiles.
Methods: The study was designed as secondary research, based on data about the number of adverse drug reactions (both serious and non-serious) reported to the EudraVigilance database. Trends of the annual reporting rates for anti-obesity medicines were analyzed by the Joinpoint

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The trends in serious adverse drug events revealed distinct differences among anti-obesity medicines: although all drugs exhibited a significant upward trend in reporting during the initial years after their market introduction, only semaglutide showed a continued growth in annual reports. In contrast, the reporting rates for the other five anti-obesity medicines either declined or remained stable without significant increases.

Fig. 1. Trends of reporting serious adverse events associated with anti-obesity medicines.

Trend Analysis Software that divides the trendline into an optimum number of segments connected by "joinpoints", and tests the significance of the trend within each segment.

Results: The analysis revealed notable differences in the trends of serious adverse drug events across the medicines. While all drugs initially showed a significant rise in adverse event reports following market introduction, only semaglutide demonstrated a sustained increase in the number of serious adverse events (annual change +67.1%, p=0.000). In contrast, a continuous increase in the reporting of non-serious adverse events was observed solely for liraglutide (annual change +33.8%, p=0.000). For the other drugs, including semaglutide, reporting rates either plateaued or declined after the initial surge.

Conclusion: Among the anti-obesity medicines currently approved in the European Union, only semaglutide exhibits a persistent upward trend in the reporting of serious adverse events. This warrants further investigation into the safety signals associated with this drug and suggests a need for enhanced monitoring and research to ensure patient safety.

PO4.165

Theoretical Obesity Treatment Strategies and Real-world Treatment Modifiers

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The new generation of anti-obesity medications, such as Wegovy and Mounjaro, has shown remarkable efficacy and increased public awareness of obesity treatment. Patients with obesity are finally beginning to be recognized as individuals with a disease, for which treatment options are emerging.

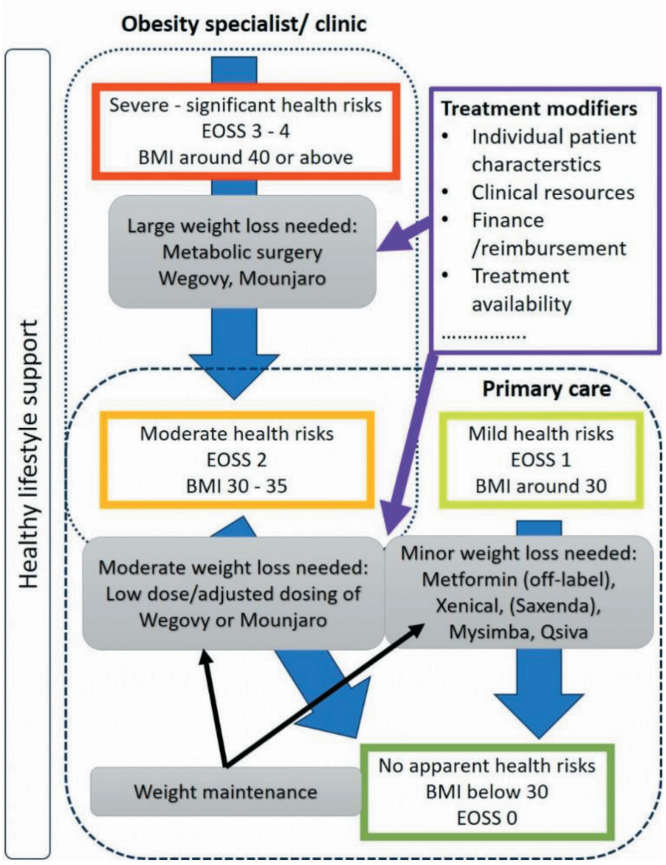
Many obesity treatment guidelines use BMI (above 30) and the presence of risk factors or comorbidities (for BMI between 27 and 30) as guiding variables for treatment selection. This strategy may miss important nuances when assessing the patient's status. The well-known Edmonton Obesity Staging System provides a more comprehensive strategy to assess overall health risk and suitable treatment options.

In the figure, a theoretical treatment pathway is depicted. It illustrates how the level of care and the patient's overall risk may govern treatment decisions, with adjustments made as the patient's risk status evolves.

However, other factors significantly influence actual treatment choices. These *"treatment modifiers"* include patient characteristics such as risk behaviors, treatment goals, financial situation, and individual agency. Additionally, available healthcare resources, such as access to an obesity specialist, the primary care physician's expertise, and local reimbursement policies, play a crucial role. Given the vast medical need, these treatment modifiers will continue to heavily influence the type of care a patient receives, often requiring compromises.

Are there key variables that guide how one should initiate treatment? How does one decide together with the patient the most appropriate therapy tailored to their unique profile? This presentation will provide examples of how various factors can shape treatment pathways in both adult and pediatric obesity clinics.

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The figure depicts the what treatement the patient should recieve, dependning on overall health, exemplified by Edmonton Obesity Symptom score and BMI. This theoretical pathway is then subjected to treatment modifiers, where some examples are given in the box.

Fig. 1. Health based treatment algorithms.

PO4.166

Community perspectives on the use of GLP-1/GIP receptor agonist medications: a cross-sectional study of 1,297 adults

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Introduction: Randomised trials demonstrated that glucagon-like peptide-1 and glucose-dependent insulinotropic polypeptide receptor agonists (GLP-1/GIP RAs) predicate substantial weight loss. GLP-1/GIP RA use is increasing worldwide and a national roll-out of tirzepatide is forthcoming in the UK health service. Understanding public perspectives on GLP-1/GIP RAs could inform approaches supporting equitable treatment roll out and uptake, and identify target areas for education to promote informed decision-making.
Methods: A cross-sectional survey of community-dwelling adults in the UK was accessible from the Imperial College Qualtrics platform by phone or personal computer between 10 Oct to 12 Nov 2024. The survey included 45 questions covering knowledge and attitudes to GLP-1/GIP RA use, weight loss behaviours and level of agreement with statements regarding GLP-1/GIP RAs. Data were analysed using Chi-squared tests, Kruskall-Wallis tests and multinomial logistic regression.
Results: 1,297 adults completed the survey: median age 44 years (IQR 37-55), median BMI 28.4 (IQR 24.8 to 33.7). 196 (16.6%) were from non-white ethnic groups. 72.6% reported weight loss attempts in the prior 12 months; 432 (33.3%) reported >10 years of attempted weight loss. 1,036 (79.9%) reported awareness of GLP-1RAs, with women significantly more likely to report both higher awareness and excellent understanding of GLP-1RAs ($p<0.05$). 359 (34.7%) reported current use, 85 (8.2%) reported prior use, and 111 (10.7%) reported interest in use. Side effects (80.5%), effectiveness (79.3%), and a way to obtain weight consistency (67.4%) were important/very important factors in deciding to use GLP-1/GIP RAs. Concerns around safety (67.1%), side effects (65.2%) and risk of weight gain after discontinuation (65.4%) were important/very important barriers to commencing GLP-1/GIP RAs. Those currently or previously using GLP-1RAs were 6.91 times more likely than non-users to strongly disagree with the statements that "risks outweigh the benefits" (RRR 6.91; 95% CI 4.32–11.05; $p < 0.001$), and "there is not enough evidence to suggest GLP-1RAs are safe" (RRR 7.33; 95% CI 4.05–13.27; $p < 0.001$).
Conclusion: There is high awareness of GLP-1/GIP RAs in the general population. Concerns regarding safety profiles, side-effects and risk of weight re-gain after discontinuation were among the leading perceived barriers to initiating GLP-1/GIP RAs in people not currently using them. Those currently using GLP-1/GIP RAs perceive these medications as safe and effective, and advocate for wider accessibility. Causes for uncertainty and skepticism in people not using GLP-1RAs highlight avenues for improved public information to support equitable roll-out and uptake of novel medications for obesity.

Conflict of Interest: NA, VL, DH & AKC are employees of Menwell Ltd. MA-A and AE-O report no conflicts.

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PO4.167

Comparison of Ultrasound against DXA in the Assessment of Lean Mass after Bariatric Surgery

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Introduction: In obesity treatment, the primary goal is often to reduce fat mass, as it plays a key role in obesity-related diseases. However, low muscle mass and strength can worsen outcomes and raise risks for conditions like type 2 diabetes and hypertension. In our previous research, we have validate the use of ultrasound for the measurement of lean mass in people living with obesity.
Objective: to validate the use of ultrasound for the measurement of lean mass in people one year after bariatric surgery.
Methods: This study was an observational follow-up study. People, who participated in our previous study and were one-year post-bariatric surgery, were asked to participate in this follow-up study. Study measurements included a three-point ultrasound of the subcutaneous fat (figure 1) with the Leeuwarden Lean Mass (LLM3) formula* and a full-body DXA scan (gold standard). Validation of this technique will be done using Bland-Altman plots, Intraclass Correlation Coefficients (ICC) and Standard Error of Measurement (SEM).
Results: In total 34 participants (85% female) were included, with a median age of 46 years and pre-operative BMI of 40.8 kg/m². The LLM3 formula showed a good ICC (0.88; 95%CI: 0.77 – 0.94) compared to DXA, without a proportional bias and a SEM of 1.6. Analysis of the post-op DXA scans revealed an average body fat reduction of 9.9%, with patients shedding around 24.5 ± 7.9 kg in fat and 15.5 ± 6.2 kg in lean mass.

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Conclusion: Ultrasound can accurately be used to assess lean mass in people living with obesity, and also after weight loss.
*LLM3 = 18.04 + (-11.08*Sex) + (-0.012*Age) + (-2.96*Height) + (0.62*Weight) + (-0.18*US-triceps) + (-0.18*US-quadriceps) + (-0.03*US-abdomen)

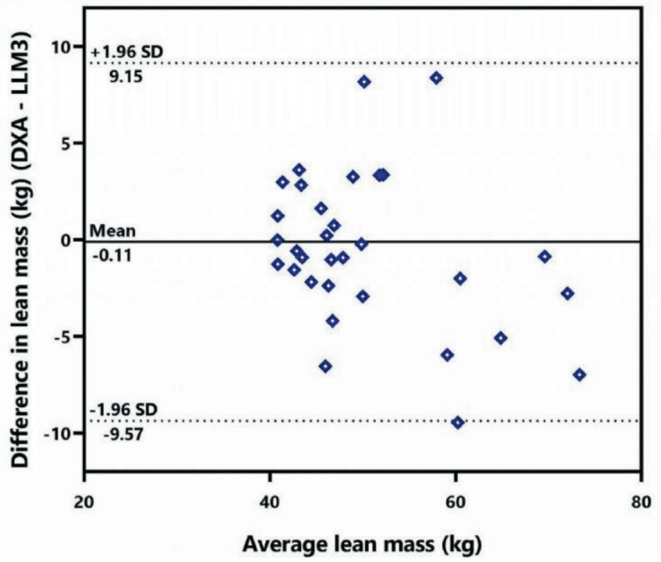


Fig. 1. Bland-Altman plot.

PO4.168

Efficacy of Phentermine/Topiramate Extended Release in Weight Management and Metabolic Profiles

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Aims: Clinical trials have demonstrated the effectiveness of phentermine and topiramate combination in weight management. This research evaluated the efficacy and safety of phentermine/topiramate extended release (ER) for weight management, focusing on alterations in body weight and metabolic parameters in routine clinical practice.
Materials-Methods: We retrospectively included people with obesity who initiated phentermine/topiramate ER between January 2020 and April 2023 at 10 tertiary hospitals in South Korea. The study assessed body weight changes at 5–6 months, and for those who continued, at 12 months, along with metabolic parameters. Total body weight was measured using calibrated electronic scales with participants in light indoor clothing.
Results: The cohort included 1,839 patients (540 men and 1,299 women), with a 5–6-month continuation rate of 48%. At 5–6 months, the mean weight reduction was 7.9%, with sex-specific losses of 7.1% in men and 8.2% in women. Over 56% of participants achieved more than 5% weight loss, with 23% exceeding a 10% reduction. Younger participants, women and those with moderate to severe obesity exhibited more pronounced weight loss compared to older, men and individuals with mild obesity, respectively. Concurrently, phentermine/topiramate ER treatment improved glucose regulation, lipid profiles, and decreased blood pressure: the HbA1c decreased by 0.4 ± 0.9%, LDL-cholesterol by 10 ± 32 mg/dL, and systolic blood pressure by 6 ± 15 mmHg (all $p<0.001$). Treatment was well-tolerated, with 15% incidence of mild adverse events like paresthesia, dry mouth, and insomnia. At 12 months, patients who persisted in treatment (21%) experienced an average weight loss of 9.6%, with 65% surpassing 5% weight loss.
Conclusion: The study suggests phentermine/topiramate ER is an effective option for obesity management in a South Korean population, though long-term adherence remains a challenge.

PO4.169

The Role of Ramadan Fasting in Weight Loss Outcomes During the First Year After Bariatric Surgery

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Introduction: Despite potential positive effect of fasting on health, there are limited body of research examining its effects on patient who underwent bariatric surgery. Existing studies have primarily focused on the safety and tolerance of fasting and metabolic profiles. This study aimed to evaluate the effect of Ramadan fasting on weight loss in the first year following bariatric surgery.
Methods: We conducted a retrospective review of all patients who underwent sleeve gastrectomy between September 2017 and November 2023. Patients were categorized into 3 groups based on their Ramadan period during the first year post-surgery: a no Ramadan group, a group that observed Ramadan 3 to 6 months after surgery [3-6 months group], and a group that observed Ramadan more than 6 months after surgery [>6 months group]). The study employed linear mixed modelling to analyze longitudinal weight data over the first year following the operation.
Results: Our study included 187 patients: 85 in the no Ramadan group, 43 in the 3-6 months group, and 59 in the >6 months group. The median age of the 3-6 months group was lowest. However, other baseline demographics, including sex, diabetes mellitus, initial body mass index, and postoperative complication, were similar across groups. Age over 40 years and initial body mass index were significant predictors of weight loss ($\beta = -2.458$, $P < 0.001$ and $\beta = -0.113$, $P = 0.357$, respectively). Although the Ramadan-experiencing groups demonstrated greater total weight loss compared to the no Ramadan group, they did not experience as much additional weight loss per month ($\beta = -0.720$, $P < 0.001$ for the 3-6 months group; $\beta = -1.209$, $P < 0.001$ for the > 6 months group)
Conclusion: Ramadan fasting presents complex effects on weight loss during the first year following sleeve gastrectomy. Further large-scale studies with detailed life style modification data are necessary to better understand the dynamics of weight loss among patients observing Ramadan fasting.

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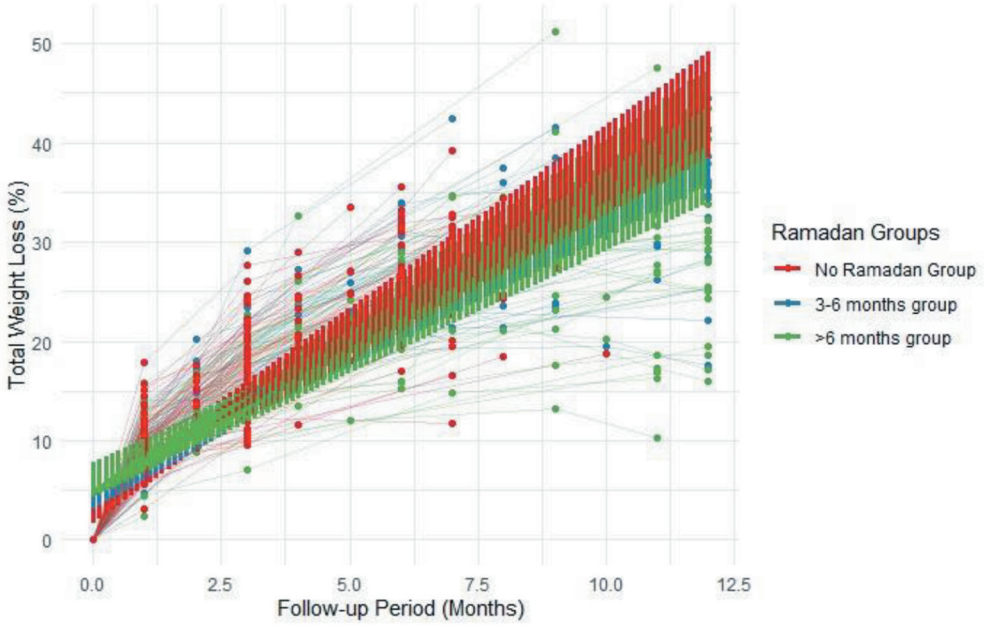


Fig. 1. Weight Loss by Ramadan Groups during the First Year after Bariatric Surgery.

Tab. 1. Basic Demographics of the Study Population.

	Total (n=187)	No Ramadan group (n=85)	3-6 months group (n=43)	>6 months group (n=59)	P value
Female (%)	151 (62.7%)	51 (60.0%)	26 (60.5%)	38 (64.4%)	0.873
Age, median (IQR), years	32.0 (25.0, 40.0)	32.0 (23.0, 41.0)	29.0 (22.0, 35.0)	34.0 (29.0, 40.0)	0.009
DM (%)	40 (16.5%)	13 (15.3%)	4 (9.3%)	9 (15.3%)	0.656
Initial BMI, median (IQR) (kg/m2)	43.5 (40.7, 47.7)	43.0 (41.2, 46.9)	45.2 (41.9, 49.9)	43.9 (40.2, 48.9)	0.357
Final weight loss (%), mean ± SD	26.4 ± 8.1	22.1 ± 6.7	29.2 ± 6.1	31.1 ± 8.0	< 0.001
Follow-up period, median (IQR), days	218.0 (174.0, 337.0)	167.0 (90.0, 197.0)	232.0 (187.5, 315.5)	351.0 (322.5, 365.0)	< 0.001
Postoperative complications (significant)	24 (10.0%)	8 (9.4%)	6 (14.0%)	6 (10.2%)	0.787

IQR; interquartile range, DM; diabetes mellitus, BMI; body mass index, SD; standard deviation

Tab. 2. Linear Mixed Model Analysis of Factors influencing Weight Loss.

Fixed Effects	Estimates	SE	t value	P value
Intercept	9.370	1.702	5.505	< 0.001
3-6 months group	1.370	0.777	1.762	0.079
> 6 months group	2.734	0.691	3.959	< 0.001
Months after surgery	3.674	0.123	29.915	< 0.001
Female	-0.860	0.513	-1.676	0.095
Age, 30-39 years	-1.018	0.557	-1.829	0.069
Age, ≥ 40 years	-2.458	0.670	-3.671	< 0.001
DM	-0.455	0.699	-0.651	0.516
Initial BMI (kg/m2)	-0.113	0.031	-3.621	< 0.001
Postoperative complications (significant)	0.821	0.740	1.109	0.269
3-6 months group × Months after surgery	-0.720	0.161	-4.476	< 0.001
> 6 months group × Months after surgery	-1.209	0.141	-8.569	< 0.001
Random Effects	Variance	SD		
Random intercepts	4.092	2.023		
Residuals	25.609	5.061		

SE; standard error, BMI; body mass index, DM; diabetes mellitus, SD; standard deviation

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PO4.170

A 4-week caloric restriction combined with high resistance-training volume and high-protein diet does not increase fat-free mass sparing but increases strength in resistance-trained individuals

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Introduction: Weight-loss protocols are often used by resistance-trained individuals who aim to reduce fat mass (FM) while maintaining fat-free mass (FFM) for performance purposes. In resistance-trained individuals under energy balance, high resistance-training volumes (HRTV) have been associated with greater increases in FFM than low-resistance training volumes (LRTV). However, less is known about the effects of HRTV under caloric restriction (CR). Therefore, it remains unclear whether HRTV could elicit greater retention of FFM and improvements in strength during CR.
Objectives: We firstly aimed to determine whether HRTV could reduce FFM losses in resistance-trained individuals during CR. Secondly, we aimed to determine if HRTV could enhance strength retention to greater extent than LRTV.
Methods: Sixteen resistance-trained individuals (14 men, 2 women) were included in this study. Participants underwent a high-protein (2.3g/kg body weight (BW)), 4-week 40% CR with a 5-day / week resistance-training intervention. Participants were randomized in either a LRTV group (12 sets/muscle group/week) or a HRTV group (30 sets/muscle group/week). Pre-post intervention testing included dual energy x-ray absorptiometry, indirect calorimetry, dietary records, resistance-training records and 5RM strength testing.
Results: A significant effect of the intervention on BW (Δ – 4.20kg ± 0.50, $p < 0.001$), FM (Δ – 3.66kg ± 0.42kg, $p < 0.001$) and %FM (Δ – 3.49% ± 0.43%, $p < 0.001$) was observed, but changes were not different between groups. No effect of the intervention was detected on FFM and bone mineral density. Significant group by intervention effects were noted for 5RM testing for chest press ($p = 0.058$), right leg press ($p = 0.03$), left leg press ($p = 0.02$) and machine row ($p = 0.052$) indicating that HRTV had greater increases in strength. A significant effect of the intervention on resting energy expenditure (Δ – 150.71kcal ± 34.11kcal, $p < 0.001$) was also noted, with no group by intervention effect.
Conclusion: HRTV seems to enhance strength to greater extent when combined with a high-protein diet despite no further advantage on body composition and metabolic parameters. Indeed, HRTV increased their strength by almost 5 times that noted in LRTV despite similar changes in FFM between groups. Mechanisms underlying such improvements remain to be investigated.

PO4.171

A personalized treat-to-target approach for obesity management: Integrating changes in adiposity measures with changes in biomarker levels towards reaching low-risk states of incident T2D and ASCVD

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Objective: Previously, we identified a waist-height ratio (WHtR) of 0.53 as a potential treatment target in obesity management, as achieving this target after a weight loss proved to be a reliable indicator of a low 10-year risk of T2D and ASCVD(*1*). In this study, we aim to study the inclusion of changes in biomarkers into the assessment of progress towards a low-risk state during obesity management.
Method: We identified a cohort of 287,976 adult individuals from CPRD Aurum (UK primary care EMRs) with records of BMI, WHtR and levels of total cholesterol, HDL cholesterol, triglycerides, systolic and diastolic blood pressure. Utilizing Cox proportional hazard models, we estimated the 10-year risk of T2D and ASCVD and explored the relationship between WHtR reduction, changes in biomarkers, and comorbidity risk.
Results: Changes in biomarker levels can complement WHtR reductions in reducing the risk of T2D and ASCVD. Elevated HDL cholesterol levels are associated with a decreased risk of both T2D and ASCVD. Additionally, a decrease in triglyceride levels is associated with a reduced risk of incident T2D, while a decrease in total cholesterol levels is associated with a lowered risk of incident ASCVD. For instance, in the case of a 50-year-old man with a WHtR of 0.60 and a cholesterol level of 6.0 mmol/L, achieving a low risk of incident ASCVD following weight loss could be realized through a combination of a WHtR of 0.53 and a cholesterol level of 5.2 mmol/L, or a WHtR of 0.58 and a cholesterol level of 4.5 mmol/L.
Conclusion: If information on biomarkers is available, integrating changes in biomarker levels during weight loss represents a stride towards a personalized treatment target in obesity management. Our findings suggest that, despite some patients not meeting adiposity-based targets, supplementary interventions (e.g., lipid-lowering) may contribute to achieving a low risk of incident T2D or ASCVD.
1: Presented at ECO 2024, Manuscript submitted in November 2024.

PO4.172

Obesity competencies for healthcare professional education: a scoping review

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Introduction: The Obesity Policy Engagement Network (OPEN)-EU manifesto, led by the European Association for the Study of Obesity (EASO), underscores the urgent need for enhanced, evidence-based education for HCPs involved in obesity care. Addressing this gap requires equipping current and future HCPs with robust obesity related professional competencies This scoping review aims to identify and profile relevant studies that report on obesity related competencies for HCPs and to synthesise identified competencies into obesity competency domains for HCP education.
Methods: A scoping review protocol was registered on the Open Science Framework (https://osf.io/2c3tn). In collaboration with an academic librarian, we developed a comprehensive search strategy targeting PubMed, CINAHL Plus and ERIC databases (2014–2024). Retrieved studies were screened independently by researchers from five participating higher education institutions using the COVIDENCE system. Based on clear inclusion criteria, full-text articles which focused on competencies related to obesity in HCP education were identified for inclusion in this review. A narrative synthesis of all reported obesity related competencies was conducted.
Results: In the final review, twenty-two studies were included (out of 1286 unique papers resulting from the database searches) with fourteen education intervention trials, four cross-sectional studies including qualitative and/or survey studies of HCP student cohorts and four expert consensus reports. Studies focused on several health care professional disciplines, including Medical, Dietetics, Pharmacy, Nursing and Physical Therapy disciplines. Different mechanisms to evaluate competencies were reported

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such as self-reported assessments or practical and theory exams. A large diversity of competencies were identified, most commonly related to pathophysiology of obesity, disease prevention, patient assessment, clinical reasoning, communication, and/or patient-centred weight management counselling.
Conclusion: This scoping review identified obesity-related competencies reported in the literature. These results will inform the development of an obesity competency framework for physiotherapists (https://www.eupromineence.com/) and findings will be of value to all HCPs, with a view to supporting the development of comprehensive, evidence-based, competency driven HCP obesity education curricula.

PO4.173

Obesity and socioeconomic vulnerabilities: evidence from COSI Portugal supporting BETTER4U - a tailored approach to weight management

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Introduction: Obesity remains a critical global health challenge, contributing to the rising prevalence of non-communicable diseases and imposing substantial burdens on public health systems worldwide. Understanding the determinants of obesity is essential for designing effective and inclusive interventions.
The BETTER4U project (2023–2027) aims to develop and implement a personalized lifestyle intervention, by addressing the multifaceted determinants of adult obesity. Data such as those provided by the Childhood Obesity Surveillance Initiative (COSI) offer critical insights into these determinants, supporting the design of tailored interventions.
Socioeconomic vulnerabilities, in particular, have been consistently identified as key determinants of obesity, requiring targeted strategies to address their impact.
Methods: COSI, conducted by WHO, not only collects data on the nutritional status of children aged 6–8 years, but also gathers family-level information self-reported by parents, including parental nutritional status (calculated BMI, classified according to the WHO reference) and socioeconomic factors.
This study utilized data from the 5th (2018/2019) and 6th (2021/2022) rounds of COSI in Portugal to perform a cross-sectional observational analysis exploring the association between adult obesity and vulnerability factors. Participants were categorized into groups based on sex (female vs. male) and the following socioeconomic variables: educational level (lower vs. higher education), perceived family wealth (experiencing financial difficulties vs. not experiencing financial difficulties), occupation (employed/student vs. unemployed/sick/disabled), and residential setting (urban vs. rural).
The aim was to identify the determinants of adult obesity to support the design of BETTER4U's personalized intervention strategies, which will be implemented in seven European countries, including Portugal.
Results: Of the 9169 adults included in this analysis, 12.2% had obesity and 21.6% reported financial difficulties.
A binary logistic regression was conducted, considering a significance level of $p<0.05$. After adjusting for confounding factors (age, sex, education level, occupation and residential setting), financial difficulties emerged as a significant predictor of obesity. Adults facing financial challenges were nearly twice as likely to have obesity compared to those without such difficulties (adjusted Odds Ratio [aOR]: 1.88, 95% Confidence Interval [CI]: 1.639–2.162; $p<0.001$).
Conclusion: This analysis demonstrates the critical role of financial difficulties in shaping obesity outcomes among adults, emphasizing the need for inclusive, tailored interventions to address the needs of at-risk populations and providing a robust foundation for BETTER4U's innovative and evidence-based strategies for weight management.

PO4.174

Understanding the intergenerational impact of obesity in Portugal: data from COSI to support BETTER4U – an innovative European project

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Introduction: Both childhood and adult obesity have been rising worldwide, as a global health challenge, with parental obesity identified as a key determinant of childhood obesity through genetic predisposition and shared obesogenic environments. This intergenerational link underscores the potential of interventions targeting adult obesity to disrupt the family cycle of obesity, such as the BETTER4U project (2023–2027), a personalized lifestyle intervention that aims to reduce obesity prevalence in adults, using artificial intelligence and evidence-based strategies.
In this context, the WHO Childhood Obesity Surveillance Initiative (COSI) provides critical data on the nutritional status of children across Europe, including valuable insights into parental factors. These data form a vital foundation for interventions like BETTER4U, guiding their design and focus.
Methods: COSI systematically collects comparable data every 2–3 years on the nutritional status of children aged 6 to 9 years across Europe. This data includes anthropometric measurements of children (weight and height), which are classified using the WHO Growth Reference Charts (5–19 years). Additionally, information on family and parental characteristics is gathered through self-reported data, including parental nutritional status (calculated BMI, classified according to the WHO reference) and socioeconomic factors.
For this analysis, a cross-sectional observational study was carried out based on data from the 6th round of COSI (2021/2022) in Portugal to explore the association between parental and childhood obesity. The aim was to support the potential of the BETTER4U project, which involves 7 countries, including Portugal, to address obesity not only at the individual level but also within families by disrupting intergenerational patterns of obesity.
Results: The sample included 4215 children and their parents. The prevalence of obesity was 12.9% among children and 13.7% among parents.
A binary logistic regression was performed, considering a significance level of $p<0.05$. After adjusting for potential confounding factors, including sex and age of both children and parents, parental education level, and perceived family wealth, parental obesity was found to be significantly associated with childhood obesity. Children with parents with obesity were 2.65 times more likely to have obesity than children of parents without obesity (adjusted Odds Ratio [aOR]: 2.65; 95% Confidence Interval [CI]: 2.133–3.292; $p<0.001$).
Conclusion: Parental obesity is a critical determinant of childhood obesity, underlining the importance of targeting parental factors in health interventions. By focusing on adult obesity, the BETTER4U project has the potential to not only reduce obesity prevalence in adults but also create positive effects within families.

PO4.175

The association between obesity/diabetes and atherogenic lipoprotein L5

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Introduction: Low-density lipoprotein (LDL) cholesterol is one of the most significant risk factors for cardiovascular diseases (CAD). Based on electronegativity and atherogenic potential, LDL cholesterol has been

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divided into five subtypes (L1-L5), with L5 being the most electronegative and atherogenic. Individuals with obesity or diabetes also carry a heightened risk for CAD. In this study, our research team collected data from 35 participants who underwent health examinations. We performed quantitative measurements of negatively charged low-density lipoprotein (% L1-5/LDL) and analyzed the prevalence and epidemiology of the L5 subtype.

Methods: Thirty-five participants were recruited from a health exam center in Taiwan. Body mass index (BMI) was calculated using weight in kilograms divided by height squared in meters. The association between % L5/LDL and obesity/diabetes was analyzed; an % L5/LDL below 2% was classified as low risk for CAD.

Results: Among the participants, there were 18 males (average age: 58.5 ± 9.7 years) with an % L5/LDL ratio of 1.57%, and 17 females (average age: 63.1 ± 8.8 years) with an % L5/LDL ratio of 1.13%. There were also 12 individuals (34.3%) classified as having ideal body weight (18.5 kg/m² < BMI ≤ 24 kg/m²), exhibiting an % L5/LDL ratio of 1.21%. Conversely, there were 13 obese individuals (% BMI ≥27 kg/m²), representing about 37% of participants, who had an % L5/LDL ratio of 1.64%. Subjects with obesity showed significantly higher levels of % L5/LDL compared to those with normal weight.

Diabetic patients (HbA1c ≥6.5%) had an average % L5/LDL ratio of 1.80%, which was higher than that observed in non-diabetic patients at just under half that level at approximately %. In terms of cardiovascular disease risk assessment based on epidemiological findings regarding the prevalence rates for the L5 subtype among our cohort members: it was found that approximately 82.8% belonged to the low-risk group (<2%), while 14.3% fell into medium-high risk group (2-5%),and only 2.9% reached high-risk status (>5%).

Conclusion: Both obesity and diabetes are significant contributors to the risk factors associated with cardiovascular disease (CAD). Our study indicated that individuals with these conditions have elevated levels of L5/LDL% compared to their healthy counterparts without these comorbidities. Further research is needed to better understand the pathways linking obesity and diabetes, L5/LDL%, and CAD.

PO4.176

ARO-ALK7, a RNAi Therapeutic Targeting Adipose ALK7 Expression for Obesity

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Introduction: While incretin-based therapies are now widely available as the current frontline pharmacotherapeutics for obesity, issues concerning associated GI adverse effects, lean body weight loss, and disproportional fat mass gain after cessation of the therapies remain a challenge for many patients. There remains a need for pharmacotherapies that can effectively and safely reduce fat mass. Genetic studies indicate that Loss-Of-Function variants of *ALK7* are not only associated with reduced abdominal obesity, but also with lower risks of type 2 diabetes and cardiovascular diseases. Silencing *ALK7* expression in adipocytes represents a novel therapeutic approach for improving body composition. We developed ARO-ALK7, a RNAi therapeutic targeting adipose *ALK7* mRNA, for treating obesity.

Methods: A surrogate ALK7 RNAi agent was evaluated in a diet-induced obese (DIO) mouse model and the pharmacodynamic properties of ARO-ALK7 were evaluated in cynomolgus monkeys. The safety and tolerability of ARO-ALK7 were further evaluated in DIO mice and Wistar rats.

Results: To evaluate the therapeutic potential of adipose-selective *ALK7* silencing by a RNAi approach, DIO mice were treated with a mouse surrogate of ARO-ALK7. The chronically treated DIO mice exhibited 39% suppression of body weight gain, 50% fat mass reduction and lean mass preservation after 16 weeks of treatment. The fat mass reduction caused by ALK7 RNAi treatment was mechanistically attributed to the enhanced lipolysis indicated by the increased levels of circulating non-esterified free fatty acids, β-hydroxybutyrates, and glycerol after challenge with CL-316243, a β_3 adrenergic receptor agonist. Furthermore, the expression of lipolysis related genes in the adipose tissue of the treated DIO mice were upregulated. The treated DIO mice also exhibited increased O_2 consumption and increased heat production, suggesting increased energy expenditure in ALK7 RNAi treated animals. The pharmacodynamics of ARO-ALK7 was evaluated in cynomolgus monkeys. Subcutaneous injection of ARO-ALK7 (0.1 to 0.75 mg/kg) caused a dose-dependent decrease in *ALK7* mRNA in subcutaneous fat. A single subcutaneous dose of ARO-ALK7 at 1.5 mg/kg resulted in ~70% decrease in *ALK7* mRNA transcripts for > 100 days in subcutaneous fat tissue. Combination therapy of ALK7 RNAi conjugate with tirzepatide in DIO mice resulted in an additive effect on body weight reduction compared to tirzepatide monotherapy, and allowed for the use of lower dose levels of tirzepatide to achieve similar therapeutic effects as a high dose of tirzepatide monotherapy.

In DIO mice, chronic inhibition of adipose *ALK7* by RNAi did not cause lipid accumulation in liver, heart or skeletal muscles. In Wistar rats, no significant histopathological toxicologic finding was detected in animals treated with ARO-ALK7 at high doses.

Conclusion: ARO-ALK7 represents a RNAi therapeutic which could alter body composition through a novel mechanism. We have demonstrated in animal models that ARO-ALK7 is potent and well tolerated, supporting clinical development.

PO4.177

Blood biomarkers and their association with lean soft tissue loss at seven weeks after bariatric surgery

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Introduction: Bariatric surgery (BS) induces rapid and significant weight loss, affecting both adipose tissue and lean soft tissue (LST). This process leads to increasing the risk of sarcopenic obesity. Biomarkers are promising tools for screening or diagnosing sarcopenia; however, evidence remains limited for individuals who have undergone bariatric surgery. This study aims to: 1) examine associations between absolute and relative changes in body mass index (BMI), body weight (BW) and LST and blood biomarker profiles; 2) compare acute changes in biomarkers between groups with different LST changes.

Methods: 28 participants (57% women; BMI= 45.4±4.6 and age= 40.3±8.8) completed 2 assessments: 1 week before and 7 weeks after sleeve gastrectomy. Body composition was assessed by DXA, and blood biomarkers were collected. Biomarkers were grouped into: 1) Iron metabolism (Iron, transferrin and saturation index, ferritin); 2) Inflammatory (IL-6, PCR, TNF-α); 3) Metabolic (Glucose, insulin, glycated hemoglobin); 4) Creatinine and albumin. Linear regression models were used to assess associations between biomarker groups and body composition changes adjusted by sex. Analysis of variance (ANOVA) was used to compare changes in biomarkers across groups categorized by percentage of LST loss (HIGHER>11.6% vs. LOWER<11.6%). The cut-offs were the median change of the whole group.

Results: Iron metabolism explained 58.4% of the variance in LST change, 46.3% in BMI change and 32.2% in total BW change. Ferritin showed a significant association with body composition changes, especially with LST loss (β=−0.016, IC 95%: [-0.0249, -0.00717], p=0.001). Creatinine and albumin (r2=0.400) and the metabolic group (r2=0.472) were positively associated with LST and BMI changes respectively; glucose levels showed significant associations with BMI changes (p=0.037). However, insulin

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levels and the HOMA index did not show significant relationships in the analyses performed. The inflammation model did not show consistent significant relationships with changes in body composition. A global model only including the significant biomarkers (ferritin, albumin, creatinine and transferrin saturation index) had a strong predictive ability, explaining up to 67.5% of the variance in LST change. When stratifying for LST loss, HIGHER LST participants showed significant increases in ferritin (71.9±98.3 ng/mL) and transferrin saturation index (7.46 ± 9.77%), while those in the LOWER group showed significant decreases in both values (-11.2 ± 76.2 ng/mL and -0.24 ± 9.46 %, respectively). Additionally, the HIGHER group showed a tendency to increase ferritin values (229±160 ng/mL; p=0.057).
Conclusion: The results indicate that ferritin and creatinine are biomarkers associated with changes in body composition. Significant changes in ferritin levels and transferrin saturation index between groups with different levels of LST loss highlight the need for close monitoring of these biomarkers during postoperative management.

Conflict of Interest: None

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PO4.178

The role of 3D visualisation based on CT in diagnosing internal herniation after RYGB

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Introduction: Internal herniation (IH) is a severe complication after Roux-en-Y gastric bypass surgery (RYGB) and treatment requires a diagnostic laparoscopy (DLS). Its diagnosis is based on clinical presentation, often combined with abdominal Computed Tomography (CT). However, diagnosing IH is challenging, as its symptoms are non-specific and the diagnostic accuracy of CT is poor. This may lead to unnecessary DLS. In this study, we explore the benefit of three-dimensional (3D)-visualisations based on CT to improve diagnosing IH and prevent unnecessary surgeries.
Methods: In this retrospective cohort study, we included all RYGB-patients that were suspected for IH and had a DLS and abdominal CT performed between January 2019 and June 2024. Based on the outcome of DLS, the presence of IH was defined and classified as "IH present" or "no IH present". 3D-visualisations based on CT were generated, demonstrating characteristics including the location and orientation of the staples used to close the mesenteric defects and the vasculature of the intestines. These characteristic CT-markers were expected to benefit the IH-diagnosis. The diagnostic accuracy of these CT-markers was calculated and compared to the original CT report.
Results: In total, 74 patients were included (57 females, mean age 44.6 years, mean BMI before RYGB 41.4 kg/m2, mean BMI before CT 28.1 kg/m2, total weight loss [TWL] 31.5%). The accuracy of the original CT report was 70.3 (sensitivity of 67.3%, specificity of 77.2%, positive predictive value [PPV] of 87.5% and negative predictive value [NPV] of 50%) and a moderate agreement was found between CT and DLS-outcome (κ= 0.386, p<.001).The accuracy of the CT-markers was 83.8 (sensitivity of 90.4%, specificity of 68.1%, a PPV of 87.0% and NPV of 75%). A moderate agreement was found between CT-markers and DLS-outcome (κ= 0.601, p<.001).
Conclusion: The CT-markers seem to be beneficial in diagnosing IH as the diagnostic accuracy improves, compared to the original CT report. Further studies should include larger sample sizes and focus on exploring clinical use and implementation of the CT-markers.

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PO4.179

Measurement and Collection of Clinical and Quality of Life Variables (PROMs PREMs) in Individuals living with Obesity in Spain

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Introduction: Obesity is a chronic condition with a profound negative impact on health-related quality of life (HRQoL), as it is associated with an increased risk of comorbidities such as type 2 diabetes, cardiovascular diseases, osteoarticular pain, and mental health issues, among others. Moreover, it generates social stigma and limits participation in daily activities, affecting both physical and emotional well-being. In recent years, GLP-1 receptor agonists have revolutionized the treatment of obesity by achieving significant weight loss (10-25%) and improving metabolic control. However, despite their effectiveness, there is no standardized set of PROMs and PREMs in the Spanish context that systematically measures the impact of these treatments on HRQoL and patient experience, which is crucial for implementing value-based care tailored to the real needs and expectations of this population.
Objectives: The aim of this study was to establish an expert committee whose final purpose is to define a standardized set of PROMs and PREMs, as well as clinical, biochemical variables, and key risk factors, to comprehensively assess the health-related quality of life (HRQoL) and the experience of individuals with obesity treated with GLP-1 receptor agonists.
Results: After compiling clinical information and considering the documented impact of obesity on HRQoL, PROMs and PREMs questionnaires validated in the Spanish-speaking population were selected. These were aimed at comprehensively assessing physical, psychological, social, sexual, sleep, and dietary dimensions, as well as adherence to and satisfaction with pharmacological treatment. Out of the 15 proposed PROMs and PREMs, the expert committee selected 7 key instruments as part of the final set to evaluate HRQoL in individuals with obesity treated with GLP-1 receptor agonists:

1. Moorehead-Ardelt Quality of Life Questionnaire (QoLQ): Assesses physical, social, self-esteem, and sexual dimensions.
2. Stigmatizing Situations Inventory (SSI): Addresses the stigma dimension.
3. PHQ-9: Evaluates depression and suicide risk.
4. STOP-BANG and ISI: Cover the sleep dimension.
5. MEDAS: Assesses adherence to the Mediterranean diet.
6. IEXPAC (Chronic Patient Experience Assessment Tool).

These instruments were chosen for their validity, reliability, and conciseness, allowing for a comprehensive and efficient evaluation of the treatment impact on patients' HRQoL.
Conclusion: From the 15 proposed PROMs, the expert committee selected a final standardized set composed of 5 key instruments, which allow for a comprehensive evaluation of the physical, social, psychological, sleep, and dietary dimensions in individuals with obesity treated with GLP-1 receptor agonists. This selection facilitates the implementation of value-based healthcare, focused on the patient's needs and perspectives.

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PO4.180

The Role of Abdominal Body Composition assessed by Computed Tomography in Colorectal Cancer Survival

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Introduction: Colorectal cancer (CRC) is one of the leading causes of cancer-related mortality. Obesity, particularly an increase in visceral adipose tissue (VAT), is associated with a chronic inflammatory state that may promote tumor development. Sarcopenia and sarcopenic obesity impact patients' performance status, with cancer cachexia representing the extreme and most detrimental end of this spectrum. However, the specific role of visceral obesity and muscle tissue health in CRC prognosis remains not fully understood. This study investigates body composition analysis as a risk assessment tool to improve clinical management of patients undergoing surgery for CRC.
Materials-Methods: This retrospective observational study included 233 patients who underwent surgery for CRC at the Santa Maria della Misericordia Hospital in Rovigo between 2017 and 2019. Inclusion criteria were patients aged 45 to 80 years diagnosed with CRC and subjected to surgical resection. Patients with genetic syndromes, those operated on urgently, and patients with stage IV carcinoma were excluded. Body composition measurements were performed using CT scans, focusing on VAT, subcutaneous adipose tissue (SAT), intramuscular adipose tissue (IMAT) indicative of myosteatosis, and muscle density (SMD) of the psoas and erector spinae muscles, as well as sarcopenia assessed through the cross-sectional area of these muscles. These parameters were correlated with mortality, stage at the time of surgery and survival.
Results: Adiposity measures were found to have no significant impact on survival, suggesting that adiposity alone may not fully capture the complexity of body composition's influence on cancer prognosis. Parameters related to muscle composition and quality, particularly myosteatosis measured via IMAT and SMD, proved more significant than muscle area as critical indicators of survival. This highlights the complex role of muscle characteristics that goes beyond traditional body mass or adipose distribution metrics. The development of an integrated prognostic index, including psoas IMAT and erector spinae SMD, could provide more precise stratification and aid in identifying high-risk patients who may benefit from early intervention strategies. Additionally, this underscores the importance of comprehensive patient management from nutritional and physical therapy perspectives to improve muscle quality.

PO4.181

Change in physical activity during weight loss and weight regain in people with obesity during a 1-year RCT combining CBT-based group treatment, low energy diet, and intragastric balloon

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Introduction: Obesity increases the risk for comorbidities and is associated with a lower level of physical activity (PA) compared to people without obesity.[1] Both weight loss (WL) and increased PA independently reduce these risks. Additionally, PA is an important factor for sustaining long-term weight maintenance following WL.[2] Standard obesity management emphasizes lifestyle interventions such as increasing PA, improving diet, and employing behavioral strategies.[3] Intragastric balloon (IGB) treatment promotes WL by reducing food intake through gastric volume restriction, delayed gastric emptying and increased satiety[4], but may hinder PA due to its mechanical presence. We evaluated the change in PA during WL and subsequent weight regain and compared the effect of IGB treatment on PA in participants with and without IGB.
Methods: We enrolled 126 participants, aged 30-65 years and BMI 32.5-45 kg/m², in a 1-year cognitive behavioral therapy-based group treatment (CBT) including a low energy diet (LED) during the first 12 weeks. After 6 months, participants were randomized into two groups: continued CBT (control group), or continued CBT and adjunct IGB treatment (IGB group). PA was assessed using wGT3X-BT accelerometers (ActiGraph, Penacola, FL, US), using vector magnitude (VM) in counts per minute (CPM) and vertical axis (VA) in CPM as PA variables. Weight was measured on calibrated scales in light clothing. Data was collected at baseline, 6- and 12-months.
Results: A total of 122 participants (110 women), age 43.6±8.5 years, BMI 38.0±3.7 kg/m², had valid weight and accelerometer wearing time at one or more timepoints. Weight decreased from 106.8±14.3 to 86.2±13.5 kg ($p < 0.001$) at 6 months. VM increased from 589±174 to 660±188 CPM ($p < 0.001$), and VA rose from 285±102 to 349±134 CPM ($p < 0.001$). WL correlated with increased VM ($p = 0.046$) and VA ($p = 0.015$). Between 6 and 12 months, the IGB group regained less weight than controls (87.6±11.5 vs. 93.6±16.1 kg, $p = 0.03$). Both groups had lower PA: VM decreased to 611±198 CPM (IGB) vs. 649±185 CPM (controls, p=0.69), and VA declined to 313±120 CPM (IGB) vs. 339 ± 143 CPM (controls, $p = 0.90$). No significant differences in PA reductions were observed.
Conclusion: LED and CBT effectively promoted weight loss and increased PA after 6 months, but partial weight regain and lower PA was observed at 12-months. IGB treatment improved weight maintenance but did not influence PA levels.

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PO4.182

Role of OGTT in phenotyping glycemic disturbance and insulin resistance in people living with overweight or obesity

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Introduction: The diagnosis of diabetes mellitus (DM) in people living with overweight or obesity can be made by determining fasting plasma glucose (FPG), glycated hemoglobin (HbA1c), or by performing an oral glucose tolerance test (OGTT). The latter is not usually performed due to its higher cost and discomfort for patients. However, its role in the diagnosis of prediabetes or diabetes in this group of patients may be of great interest.
Methods: Single-center, retrospective study that screened people with overweight or obesity without diabetes who underwent an OGTT between April 2017 and February 2024 at the Department of Endocrinology and Nutrition of the Clínica Universidad de Navarra (Pamplona, Spain). Sociodemographic and clinical data were collected. The results of the OGTT were related to those of FPG and HbA1c according to the American Diabetes Association (ADA) diagnostic criteria for prediabetes/diabetes. Insulin indices were calculated taking into account both baseline and OGTT values.
Results: A total of 656 patients were included, whose mean age was 46.2 ± 14.3 years, 61.7% were females. The mean body mass index (BMI) was 32.1 ± 5.1 kg/m2, and 37.7% lived with overweight. When FPG and HbA1c were considered, 45.6% of patients had prediabetes and 3.6% had diabetes, but when FPG, HbA1c, and OGTT were considered, 48.5% had prediabetes and 8% had diabetes. While 50.8% of patients had normal FPG and HbA1c, when performing the OGTT, 13.8% of them had prediabetes and 0.90% had diabetes. When insulin indices based on baseline values alone were used, 51.9% of patients had insulin resistance (HOMA-IR > 3). However, when indices based on OGTT values were also considered, 56.4% of patients had insulin resistance (HOMA-IR > 3 or Matsuda < 2.5). Of those without insulin resistance using baseline values alone (HOMA-IR < 3), 9.5% had insulin resistance based on OGTT values (Matsuda < 2.5).
Conclusion: OGTT improves the diagnosis of prediabetes and diabetes and insulin resistance status in people living with overweight and obesity in a clinical setting.

PO4.183

Economic Burden of Obesity in Hungary; Public Health Care and Out Of Pocket Expenditures, in 2019 and 2022

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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.
Method: Expenditures related to the patients with obesity and more frequent co-morbidities were requested from the national database of National Health Insurance Fund. Financing of the inpatient and the outpatient providers, reimbursement for prescription of medicines and healing aids were collected.
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 (393 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) for 2019 and 43 Billion HUF (109 Million EUR) for 2022. Public expenditures and co-payments related to diabetes Type2, and hypertension were the highest. The public and individual expenditures together represents 0.3-0.4% of the Hungarian GDP.
Conclusion: Reducing of high expenses could be possible by appropriate education and public health policy, to prefer early prevention, and weight reduction among persons living with obesity at individual level. To calculate the cost of obesity, to improve homogeneity and comparability an international consensus is required on standardized methods.

Conflict of Interest: None Disclosed

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PO4.184

Transforming Obesity Care Through Digital Innovation: Enhancing Efficiency, Access, and Comprehensive Management in Madrid's Public Hospitals

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The high prevalence of Obesity in Spain poses major challenges for specialized care. Currently, only a minority of people living with severe Obesity (PwOs) or eligible for bariatric surgery have access to the public healthcare system. Limited and inefficient care structures lead to delays in diagnosis and treatment. Digital transformation can improve the management of obesity's complexity and heterogeneity, optimizing resources and expanding access to specialized care.
Objective: To compare data related to the management of the care program for PwOs, uniformly applied across four public hospitals in Madrid: FJD, HUIE, HRJC and HGV.
Methods: Since 2021, patients have progressively followed an automated and scheduled care pathway, incorporating the highest possible level of digitalization in procedures(Figure1). Digital tools are employed for precise disease diagnosis, based in OBEDIS project, prior to the first doctor appointment.This includes a comprehensive characterization of the pathophysiological status, weight history, screening for associated conditions, body composition analysis beyond BMI, and severity stratification using the Edmonton Obesity Staging System(EOSS). Also patients actively participates in an interdisciplinary, group-based, virtual program. (Table1&2).Management data from 2019 (pre-digitalization) has been compared to 2023.
Results: Number of patients evaluated increased by 30,3% from 2019 to 2023 (2,731 vs. 3,559). 91% of patients chose to participate in the digital program. Body composition analysis was performed in 100% of patients, compared to only 7% in 2019. Screening for cardiovascular risk, obstructive sleep apnea, and metabolic liver disease reached 97%. Severity obesity was stratified using EOSS in 100% of patients, whereas in 2019, BMI was the only standard used for evaluation.The restructuring and reorganization of the process significantly improved efficiency and resource utilization. It reduced the average follow-up duration from 38 months to 18 months, while the annual actions-per-patient ratio, including visits and

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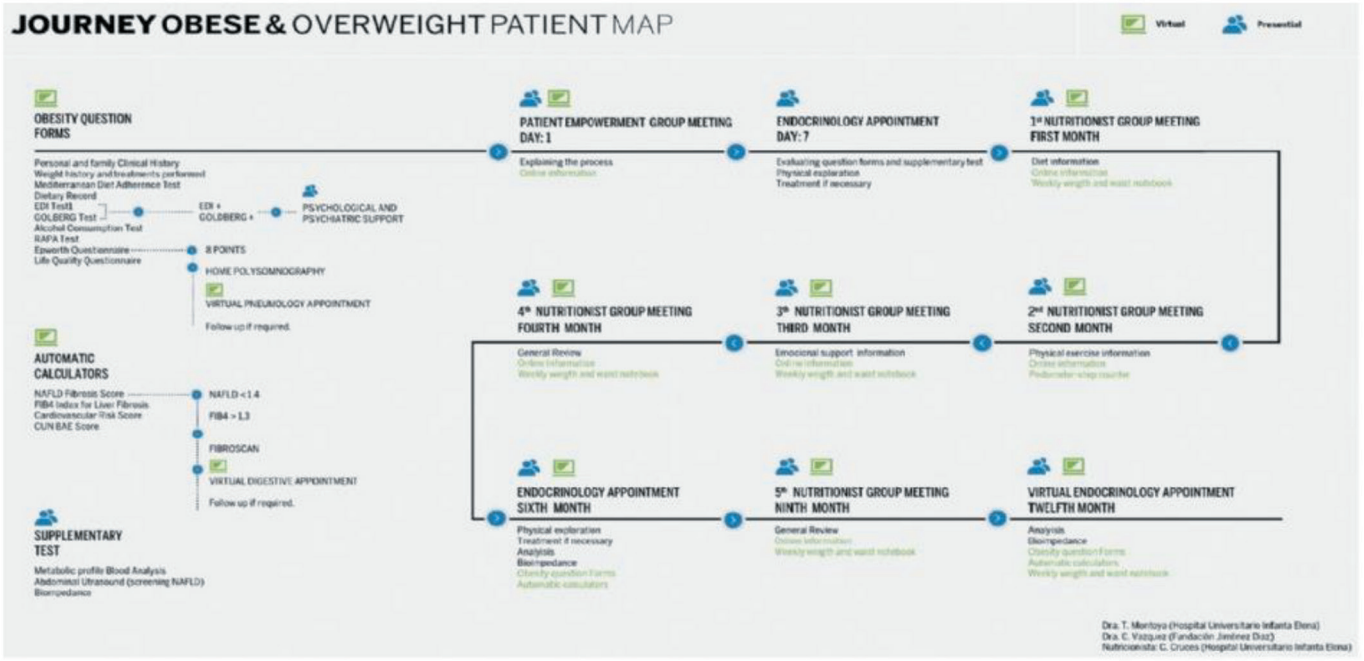


Fig. 1.

Tab. 1.

In-hospital procedure	Information provided	In-person visit		
		First (baseline)	Second (6 mth later)	Third (12 mth later)
Biochemical tests*	Complete metabolic profile	X	X	X
Bioimpedance*, dinamometry	Body composition	X	X	X
Abdominal ultrasound	Abdominal organ status, body composition	X		
Questionnaire	**Information provided**			
In-house developed form†	May unveil underlying causes of body weight gain	X		
RAPA	Physical activity habits	X	X	X
GADS	Emotional status	X	X	X
EDI, subscale Bulimia	Eating disorder habits	X	X	X
MEDAS	Nutrition habits	X	X	X
IWQOL	Quality of life	X	X	X
ESS	Daytime sleepiness	X	X	X
Morisky-Green	Adherence to pharmacological treatment of obesity		X	X
PREMS	Patient's experience		X	X
Staging systems and risk scores	**Provides information about**			
EOSS	Severity of obesity	X	X	X
FIB-4 Index	Liver fibrosis	X	X	X
NAFLD Score	Liver fibrosis	X	X	X
Framingham Risk Score	10-year risk for manifesting CVD	X	X	X
FindriskScore	10-year risk for onset of DM2	X	X	X

Procedures undergone by the patient prior to in-person visits to endocrinologist Abbreviations: CVD, cardiovascular disease; EDI, Eating Disorder Inventory; EOSS, Edmonton Obesity Staging System; ESS, Epworth Sleepiness Scale; FIB-4, fibrosis-4; Findrisk, Finnish Diabetes Risk; GADS, Goldberg Anxiety and Depression Scale; IWQOL, Impact of Weight on Quality of Life; MEDAS, Mediterranean Diet Adherence Screener; NAFLD, Non-Alcoholic Fatty Liver Disease; RAPA, Rapid Assessment of Physical Activity. bContains questions regarding anamnesis, family history of obesity or diabetes, gynecological history when applicable, patient's body weight evolution, nutrition habits, obesity triggers, obesogenic medication, obesity perpetuating factors, bowel habit, recent/past relevant events with influence on daily life.

tests, dropped from 17.8 to 7.12. Additionally, the relative cost of physician care decreased by 52%, and the cost of laboratory tests was reduced by 53.14%

Conclusions: -Digital transformation has achieved a 30% increase in the number of patients evaluated, and has reorganized our medical practice practices around health condition.

- New approach improves comprehensive diagnosis. Given the multifaceted nature of Obesity, it is essential to gather extensive information as recommended by expert guidelines, which outline a core set of variables that must be routinely evaluated to minimize variability in diagnoses, treatments, and outcomes. The collection of this data online, allows a non-judgmental environment, significantly reduces the time required, and eliminates unnecessary appointments and travel, fostering a more efficient and value-driven healthcare model
- 100% of patients undergo full body composition analysis and stratification.
- The integration of digital tools can alleviate the economic burden and achieve a more sustainable system prioritising the quality over the volume services.

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Tab. 2.

Group virtual sessions	Welcome session	Session 1	Session 2	Session 3	Session 4	Session 5
Schedule	1 wk before 1st IPV	1 mth after WS	2.5 mth after WS	4.0 mth after WS	5.5 mth after WS	9 mth after WS
From system to patient						
Welcome video	X					
Encouraging intro to warrant active involvement	X					
General recommendations	X		X		X	X
Guidelines to measure AC	X					
Principles of Mediterranean diet	X					
Obesity causes/management: fundamentals		X				
Long-term healthy habit re-education program		X				
Suitable foods directory		X				
Advice on weekly portions (exchange diet)		X				
Menus (1.250-2.500 kcal)		X	X	X	X	X
Awareness on benefits of physical activity			X			
Workout guidelines			X	X		
Elastic band workout, weight training			X			
Emotional control tips				X		
Motivational factors to loss weight				X		
Tutoring/coaching by other patient(s)				X		
Introduction to pharmacological approach				X		
Heart-healthy diet					X	
Concise review of previous sessions						X
Healthy shopping basket						X
Tips to avoid weight regain at long-term						X
From patient to system						
Weekly body weight		X	X	X	X	X
Weekly AC		X	X	X	X	X
Weekly pedometer monitoring				X	X	X

Scheduled activities during the virtual assistance pathway

Tab. 3. RESULTS

	2019	2023	Change (%)
Number of patients evaluated	2,731	3,559	+30.3%
Use of body composition techniques (%)	7%	100%	+1,328.6%
Cardiovascular risk screening,Metabolic liver diseaseObstructive Sleep Apnea and mental health.	12%	97%	+708.3%
Obesity severity stratification (%)	0%	100%	New implementation
Average process duration (months)	28	18	-52.6%
Total actions per year	48.736	2576	-94,7%
Ratio of actions per patient	17,8	7,12	-60%
Cost of medical care per patient (€)	511	241,89	-52,7%
Cost of laboratory studies (€)	159,4	74,67	-53,2%

PO4.185

Evolution of body composition in patients undergoing bariatric surgery as a function of post-surgical protein supplementation and surgical technique

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Introduction: In the first months after bariatric surgery (BS), there is a risk of worsening body composition (BC), due to progression diets restricted in calories and proteins and the difficulty of food tolerance secondary to gastric restriction or malabsorption depending on the type of surgery.
Methods: Descriptive cohort study of patients undergoing BS between 2013-2023 and followed up in Endocrinology and Nutrition. Patients who had received a progression diet were divided into patients with a progression diet and a normocaloric high-protein oral nutritional supplement (ONS) during the first two weeks after surgery and the technique.
BC variables were collected by bioimpedance. Differences between the preoperative period, first and sixth month post-surgery were analyzed.
Results: 140 patients with restrictive techniques (RT), 55.72% (n=78) received ONS. 41 patients with malabsorptive techniques (MT), 24.39% (n=10) received ONS.
No differences were found in % of excess weight loss at one and six months. A smaller decrease in FFM (fat free mass), FFMI (fat free mass index) was observed in the ONS group in both types of techniques between the pre-surgery and month values FFM RT -3.57(0, 56)VS +0.85(2.61) p=0.03, FFM MT +4.08(2.69)VS +1.85(0.08) p=0.01; FFM RT -1.19 (0.14)VS

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+0.25(0.86) p=0.01, FFM MT +1.47(0.89)VS +0.89(0.31) p=0.01. In MT, a smaller decrease in skeletal muscle mass index (ASMI) was observed -0.72(0. 68)VS +0.59(0.09) p=0.01.
A smaller decrease in FFM was observed when comparing baseline values and sixth month -6.25(3.35 VS -0.93(3.88) p = 0.04 in RT. In MT, a smaller decrease in ASMI and FFMI -1.06(0.61)VS +0.72(0.42) p = 0.01; -3.16(2.48 VS +1.42(0.12) p = 0.01. Likewise, a smaller decrease in phase angle was recorded in both techniques -0.66(1. 18)VS +0.80(0.15) p = 0.02 RT; -1.85(2.15)VS +1.07(0.16) p = 0.02 MT.
No BC differences were found between one month and six months postoperatively in RT. In MT, a smaller decrease was recorded in FFM -5.06(6.69) VS +1.50(0.43) p = 0.04 and FFMI -1.76(2.27)VS + 0.71(0.60) p = 0.03.
Conclusions: Patients with protein supplementation after BS maintain FFM and ASMI compared to patients without supplementation, with no differences in weight loss. Furthermore, these differences are similar in both surgical techniques.

Conflict of Interest: None Disclosed

Funding: No funding to report

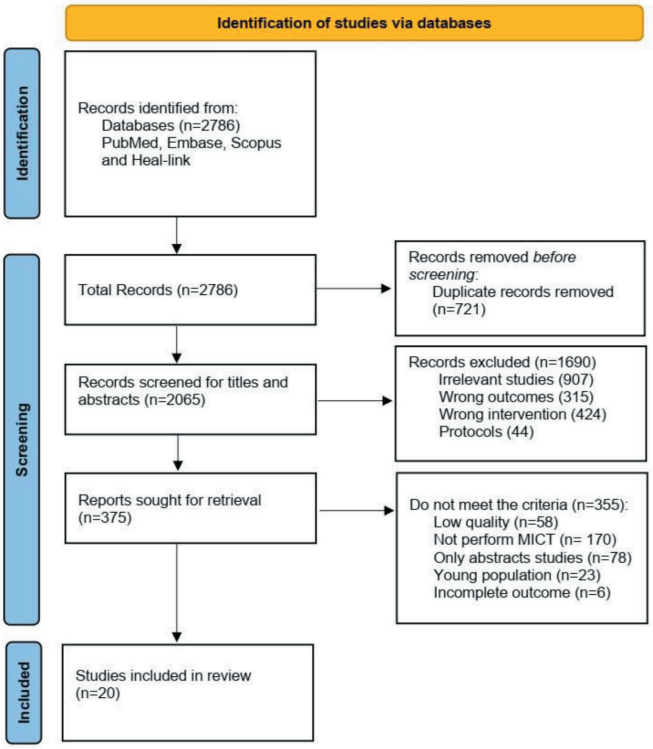
PO4.186

High-intensity interval training (HIIT) compared to moderate-intensity continuous training (MICT) on body composition and insulin sensitivity in adults with overweight and obesity

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Objective: To compare the effects of HIIT vs. MICT on adults with overweight and obesity. Outcomes, including changes in body mass index (BMI), weight, body fat, and insulin sensitivity, were analyzed.
Methods: A literature review was conducted. Clinical randomized trials involving individuals who are overweight and obese and comparing HIIT with MICT effects on insulin sensitivity, weight, BMI, body fat percentage, and waist circumference were included. PubMed, Embase, Scopus and Heal-link databases were searched in English using controlled vocabulary and free-text terms related to HIIT, MICT, obesity, and overweight. The search included studies published from 2018 until 2024. The results were presented through a review. The research did not receive any specific funding.
Results: Of the 2786 articles, 20 met the eligibility criteria. The intervention duration ranged from up to 16 weeks. No differences were observed in BMI, weight, waist circumference, in body fat percentage and in insulin sensitivity. Limitations included the high heterogeneity in training protocols, measurements, and study duration that prevent us from performing a systematic review and meta-analysis. Additionally, a risk of bias was identified in these studies.
Conclusion: HIIT and MICT did not significantly differ in their effects on weight, BMI, waist
circumference, or body fat mass in adults with overweight and obesity. Due to the limitations, further studies are required to confirm these findings.



Flow chart of selected studies

Fig. 1. Flow chart.

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Tab. 1. Studies characteristics and outcomes.

Author	Year	Sample M/W	Country	Duration (weeks)	Type of Exercise	Frequency days/ week	Description protocol	Outcomes end points
Nie et al.	2018	W	China	12	Bike	3 - 4	Warm up: 10 min at 50–60% HRmax. HIIT: 4 min at 90% VO2max following 3 min of active break with a work out at 300 kJ. Recovery: 5 min at 50–60% HRmax.	HIIT has similar findings with conventional exercise in body mass, BMI and fat mass
Zapata Lamana et al.	2018	M	Chile	12	Bike	3	Warm up: 5 min HIIT: 4x4 at 90% VO2peak, with 2 min of active break in between and 4 min recovery.	Body mass decreased with conventional but not with HIIT. No differences in insulin sensitivity
Boukabous et al.	2019	W	Canada	8	Treadmill	3	Warm up: 3 min (50–70% HRR). HIIT: 6 intervals 1 min at 90% HRR with 2 min active break at 40% HRR. Recovery: 2 min at 40% HRR	HIIT has similar findings with conventional exercise in body mass, and waist circumference
Gerosa-Neto et al.	2019	M	Brazil	6	Treadmill	3	Warm up: 5 min. HIIT: 10 rounds of 100% MAV 1 min duration, following 1-min passive break interval	HIIT has similar findings with conventional exercise in BMI
Sun et al.	2019	M	China	12	Bike	3	HIIT: 9 repetitions × 4 min at 90% of VO2peak with 3 active breaks with a work out at 200–300 kJ.	HIIT has similar findings with conventional exercise in body mass. HIIT was better in insulin resistance outcome.
Chin et al.	2020	M/W	China	8	Running	3	Warm up: 5 min. HIIT: 12 × 1 min at 90% HRR with 11 × 1 min active break at 70% HRR. Recovery: 5 min.	HIIT decreased the body mass vs. conventional exercise
Dupuit et al.	2020	W	France	12	Bike	3	Warm up: 5 min. HIIT: 60 min of 8 sec at 80–90% of HR peak with 12 sec of active break. Recovery: 2 min.	HIIT has similar findings with conventional exercise in body mass, BMI and in waist to hip ratio
Gerosa-Neto et al	2020	M	Brazil	6	Treadmill	3	Warm up: 7 min. HIIT: 10 repetitions of 1 min at 100% MAV with 1 min of passive break.	HIIT has similar findings with conventional exercise in insulin sensitivity
Inoue et al.	2020	M	Brazil	6	Treadmill	3	Warm up: 5 min. HIIT: 10 periods of interval running for 1 min at 100% MAV, with 1 min of passive break	HIIT has similar findings with conventional exercise in body mass, BMI and fat mass
Poon et al.	2020	M	China	8	Running	3	Warm up: 5 min at 60% HRmax. HIIT: 6–10 series of 1 min at 80–90% of HRmax following 1 min of active break at 50% HR max. Recovery: 5 min at 50% HRmax	HIIT has similar findings with conventional exercise in body mass, BMI and waist circumference
Ram et al.	2020	M	Australia	6	Bike	3	Warm up: 3 min at 65% HRpeak. HIIT: 24 min, 10 × 1 min at ~90% HR peak with 1 min of active break with low workout. Recovery: 2 min in low intensity.	HIIT has similar findings with conventional exercise in body mass, BMI and fat mass
Rodrigues et al.	2020	M/W	Brazil	16	Treadmill Bike	3	Warm up: 10 min HIIT: 4 × 4 min periods at 85–95% HRpeak, with 3 min of active break at 50–70% HRpeak. Recovery: 5 min	HIIT has similar findings with conventional exercise in body mass and waist circumference
Ryan et al.	2020	M/W	USA	12	Treadmill Bike Elliptical Rowing	4	Warm up: 3 min at ~65% HRmax, HIIT: 10x1-min at 90% HRmax following 1 min of low intensity active break in between. Recovery: 3 min at ~65% HRmax.	HIIT has similar findings with conventional exercise in insulin sensitivity
Vaccari et al.	2020	M/W	Italy	12	Treadmill	3	Warm up: 10 min (50% VO2peak). HIIT: 3–7 repetitions of 3 min at 100% VO2peak, following 1.5 min of low intensity walking (50% of VO2peak). Recovery: 5 min (50% of VO2peak).	HIIT has similar findings with conventional exercise in body mass, BMI, fat mass and insulin resistance
Zhang et al.	2021	W	China	12	Bike	3 - 4	Warm up: 10 min. HIIT: 4 x 4 min at 90% VO2peak, following 3 min of passive break in between. Recovery: 5 min.	HIIT has similar findings with conventional exercise in body mass and fat mass

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Tab. 1. Studies characteristics and outcomes.

Author	Year	Sample M/W	Country	Duration (weeks)	Type of Exercise	Frequency days/ week	Description protocol	Outcomes end points
D'Amuri et al.	2021	M/W	Italy	12	Tread-mill	3	Warm up: 10 min at 50% VO2peak HIIT: 3–7 repetitions 3 min at 100% VO2peak following 1.5 min active break 50% VO2peak. Recovery: 50% VO2peak	HIIT has similar findings with conventional exercise in insulin concentration
Gripp et al.	2021	M/W	Brazil	8	Bike	3	Warm up: 5 min. HIIT: 85–100% of HRmax	HIIT has similar findings with conventional exercise in BMI and fat mass
Hu et al.	2021	W	China	12	Bike	3	HIIT: 4 min at 90% VO2peak following by 3 min active break in between with work out 200/300 kJ	HIIT has similar findings with conventional exercise in body mass, BMI and fat mass
Colpitts et al.	2022	M/W	Canada	1	Bike	1	HIIT: 35 min at 50% HRR following every 5 min by high intensity intervals with 2 min at 85%–90% HRR	HIIT increased irisin (a hormone that has the ability to activate beneficial changes in adipose tissue that improve muscle activity
Mattia D'Alleva et al.	2023	M	Italy	12	Tread-mill	3	Warm up: 10 min 50% of VO2 peak HIIT: 5 x 7 repetitions for 2-min at 95% of VO2 peak) following 1 min walking at 50% of VO2 peak. Recovery: 5 min 50% of VO2 peak	HIIT has similar findings with conventional exercise in body mass and fat mass

HIIT: high intensity interval trainig. HRR: heart rate reserve. HRmax - HRpeak: maximun heart rate, MAV: maximum aerobic velocity. VO2max - VO2peak: maximum rate of oxygen consumption, BMI: body mass index

PO4.187

Intermittent Phentermine and Lifestyle Changes in Obesity Management: A Randomized Study

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Introduction: Obesity significantly increases the risk of metabolic and cardiovascular diseases, necessitating effective therapeutic strategies. While lifestyle interventions are essential, pharmacotherapy can amplify outcomes. This study evaluates the efficacy of intermittent phentermine administration (21.4 mg) combined with caloric restriction and structured exercise compared to lifestyle interventions alone in reducing fat, visceral fat, waist and hip circumference, and increasing muscle mass over 14 months.

Methods:

Study Design and Participants:

This randomized controlled trial included adults aged 21–40 years with a BMI of 27–35 kg/m² and no comorbidities. Participants were randomly assigned to two groups:

Phentermine + Lifestyle Group: Received 21.4 mg of phentermine daily for three months, followed by a one-month suspension, repeated cyclically. They also followed a hypocaloric diet (500 kcal/day deficit) and 150 minutes of supervised aerobic exercise weekly.

Lifestyle Only Group: Followed the same diet and exercise regimen without pharmacotherapy.

Outcomes and Measurements:

Primary outcomes included total fat reduction (%), visceral fat reduction (%), and waist and hip circumference changes (cm). Secondary outcomes included muscle gain (kg). Measurements were conducted at baseline and every three months using bioelectrical impedance analysis (BIA) and 3D body scanning.

Statistical analysis included independent t-tests and repeated-measures ANOVA for group comparisons, with mixed-effects models used to evaluate longitudinal changes ($p < 0.05$).

Results:

Fat and Visceral Fat Reduction:

The phentermine group achieved greater total fat reduction (22.8% vs. 12.1%; $p < 0.001$) and visceral fat loss (26.5% vs. 14.3%; $p < 0.001$) compared to the lifestyle only group. Figure 1

Waist and Hip Circumference:

Waist circumference reduction was more pronounced in the phentermine group (10.2 cm vs. 6.3 cm; $p < 0.01$), as was hip circumference reduction (7.8 cm vs. 4.9 cm; $p < 0.01$). Figure 2

Muscle Gain:

Both groups gained muscle mass, but the phentermine group showed a significantly increase (3.9 kg vs. 2.1 kg; $p < 0.05$).

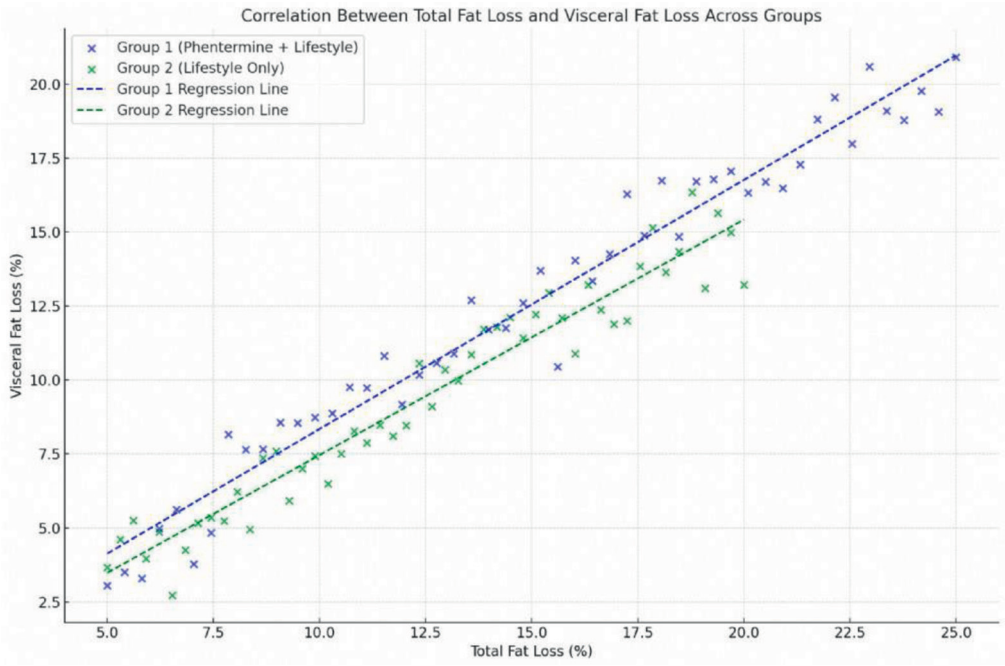
Statistical Insights:

Longitudinal analysis showed significant time × group interaction effects for fat reduction ($F = 15.7$; $p < 0.001$) and muscle gain ($F = 8.3$; $p = 0.004$). Strong correlations were observed between fat loss and waist circumference reduction ($r = 0.85$; $p < 0.001$). Figure 3

Discussion: Intermittent phentermine administration combined with lifestyle modifications significantly outperformed lifestyle interventions alone, yielding substantial improvements in body composition metrics. The cyclical dosing regimen sustained efficacy while minimizing concerns related to long-term pharmacotherapy. These findings underscore the potential of intermittent pharmacotherapy in comprehensive obesity management.

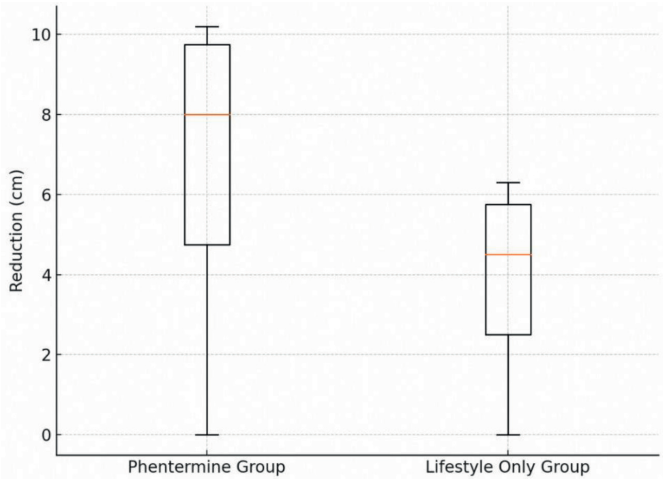
Conclusion: This study demonstrates that intermittent phentermine use, alongside caloric restriction and exercise, is a highly effective strategy for obesity management, outperforming lifestyle interventions alone. These results advocate for integrating intermittent pharmacotherapy into multidisciplinary obesity treatment protocols.

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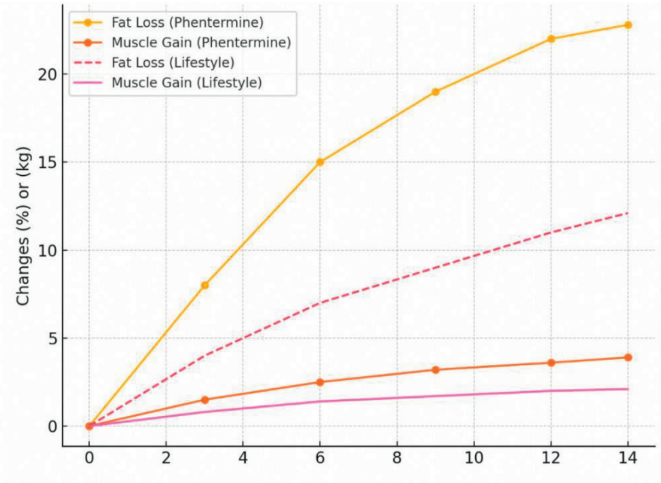
This advanced graph compares the correlation between total fat loss and visceral fat loss across two groups: • Group 1:Represented in blue, showing a stronger correlation. • Group 2:Represented in green, with a slightly weaker correlation.

Fig. 1.



Waist Circumference Reduction

Fig. 2.



Interaction Effect Over Time

Fig. 3.

PO4.188

Impact of psychological interventions on weight loss in post-bariatric surgery adults: a systematic review

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Introduction: Bariatric surgery is considered an effective treatment for individuals living with obesity. Post-bariatric psychological modifications contribute to weight loss compared to patients who do not receive them. This study aimed to conduct a systematic review of psychological interventions following bariatric surgery and their relationship with weight loss.

Methodology: A search for randomized controlled trials was conducted in PubMed, Cochrane, Web of Science, and EBSCO databases up to October 2024 following the PRISMA guidelines. Studies evaluating patients who received psychological care after their bariatric procedure were included. The GRADE system was used to assess the quality of the included studies.
Results: Of 250 articles identified, eight met the inclusion criteria. Three studies reported significant results in the intervention groups (n=196, $p<0.05$), while the other five studies did not find significant differences in weight loss percentages between control and intervention groups.

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Conclusion: The evaluated studies show a lack of consistency in the effectiveness of psychological therapies aimed at behavioral and motivational modifications. Greater evidence is needed to establish and support standardized protocols that validate these interventions as effective tools for weight loss in post-bariatric surgery patients

PO4.189

Association Between Obesity and Glomerular Hyperfiltration

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Introduction: Excess weight has become a major public health problem worldwide, and its impact on renal function has been extensively studied. The pathophysiology of kidney damage is complex, involving hemodynamic factors, physical forces, as well as vasoactive and profibrosing substances. Obesity is positively correlated with the occurrence of proteinuria and the development of glomerulopathy. Here we discuss the correlation between obesity and glomerular hyperfiltration.
Materials and Methods: We conducted a retrospective study, selecting the files of 64 patients followed for obesity out of a total of 112 patients, with a study duration of Two year. All the patients included were over 18 years of age, with a BMI greater than 30 kg/m², and without diabetes or arterial hypertension. Several confounding factors were taken into account, including dietary factors such as sodium and protein intake. Creatinine clearance was determined using the Medical Calculus application for glomerular filtration rate, and a glomerular filtration rate greater than 140 ml/min was used to define glomerular hyperfiltration.
RÉSULT: The mean age of our patients was 44 years, with extremes of 22 and 72 years, the most frequent age group being 35-50 years. In our series, 57 women and 7 men were predominantly female. The body mass index of our patients ranged from 32 to 50 kg/m². Median creatinine clearance was 137ml/min. The prevalence of glomerular hyperfiltration increased in all BMI categories with a p value < 0.001, i.e. 27 patients with glomerular hyperfiltration greater than 140ml/min. Our patients were candidates for better characterisation of renal function by 24-hour proteinuria testing for glomerulopathy and renal ultrasound to assess the morphological state of the cortico-medullary gradient in order to manage it therapeutically.
Conclusion: BMI categories and glomerular hyperfiltration are positively associated, independently of other known risk factors for chronic kidney disease and fluid and electrolyte disturbances. Hence the need for systematic screening for glomerular hyperfiltration, which should be considered in overweight and obese populations.

PO4.191

Efficacy and Safety of Latilactobacillus sakei LB-P12 on Joint and Cartilage Health: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial

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Background: Persistent knee joint pain is a common issue in middle-aged and older adults with obesity, significantly impacting mobility and quality of life. While probiotics have shown potential anti-inflammatory and health-promoting effects in preclinical studies, their role in joint and cartilage health has not been thoroughly explored in humans. This study represents the first randomized, double-blind, placebo-controlled clinical trial to evaluate the efficacy and safety of Latilactobacillus sakei LB-P12 in improving joint health and alleviating knee pain in a human population.
Methods: This randomized, double-blind, placebo-controlled clinical trial included 100 participants aged 40–75 years with knee joint pain lasting for over six months. Participants were randomly assigned to either the LB-P12 group (n = 50, receiving 350 mg/day, 10^9 CFU) or the placebo group (n = 50) for 12 weeks. Eight participants dropped out (LB-P12: 5, placebo: 3), leaving 92 for analysis. The primary outcome was the change in WOMAC total scores (pain, stiffness, and physical function). Secondary outcomes included changes in VAS scores, inflammatory markers (CRP, ESR, IL-1β, IL-6, TNF-α), cartilage biomarkers (COMP), joint space width, and quality of life measured by EQ-5D-5L. Safety evaluations included laboratory tests and vital signs.
Results: After 12 weeks, the LB-P12 group showed significant improvements compared to the placebo group. WOMAC total scores decreased by 15.3 ± 3.2 points in the LB-P12 group compared to 8.7 ± 2.8 points in the placebo group ($p = 0.009$). VAS scores decreased by 2.4 ± 0.5 points in the LB-P12 group compared to 1.1 ± 0.4 points in the placebo group ($p < 0.001$). IL-1β levels were significantly reduced in the LB-P12 group by 1.8 ± 0.3 pg/mL compared to 0.7 ± 0.2 pg/mL in the placebo group ($p < 0.001$). Additionally, quality of life scores (EQ-5D-5L) improved significantly in the LB-P12 group compared to the placebo group ($p = 0.021$). No adverse events or clinically significant abnormalities were observed in safety evaluations, including laboratory tests and vital signs.
Conclusions: Latilactobacillus sakei LB-P12 was found to be safe for daily consumption and effective in reducing knee pain, improving physical function, and enhancing overall quality of life. These findings suggest that LB-P12 may serve as a promising probiotic option for managing knee joint discomfort.

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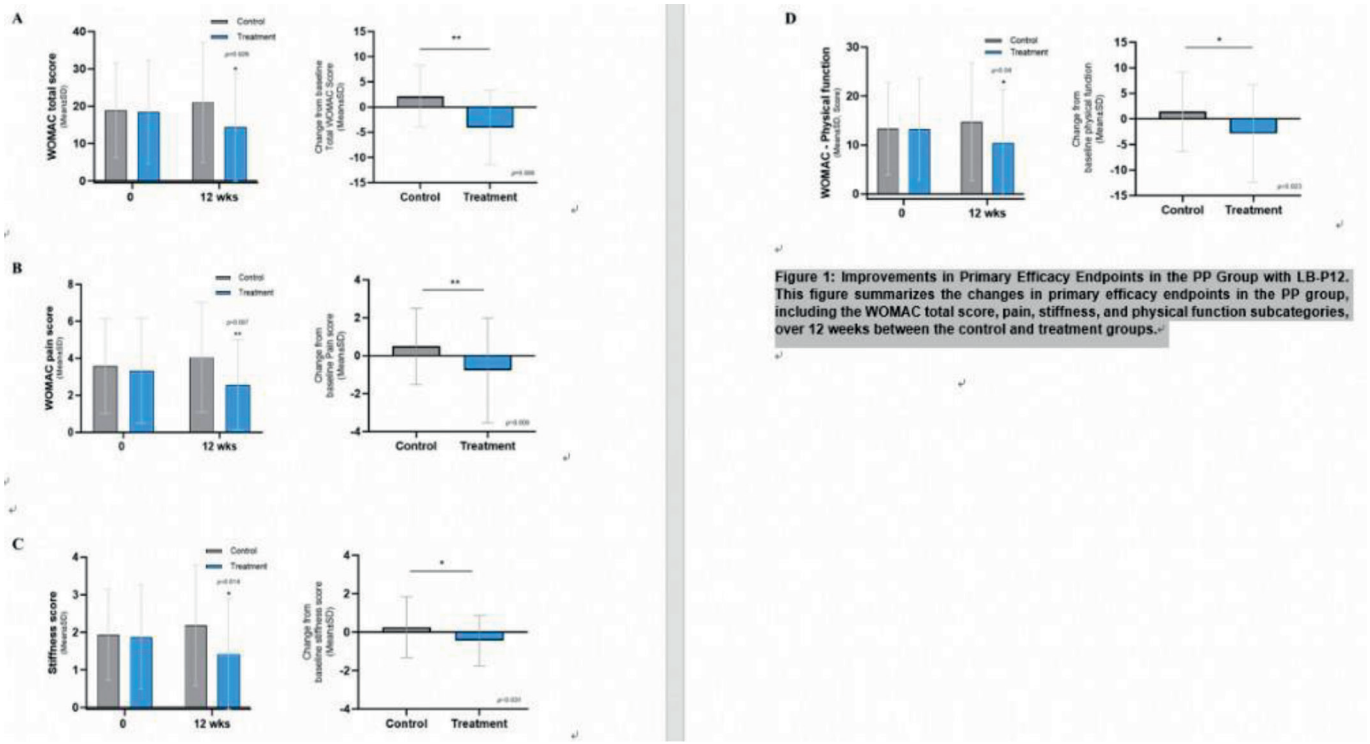


Figure 1: Improvements in Primary Efficacy Endpoints in the PP Group with LB-P12. This figure summarizes the changes in primary efficacy endpoints in the PP group, including the WOMAC total score, pain, stiffness, and physical function subcategories, over 12 weeks between the control and treatment groups.

Fig. 1. Improvements in Primary Efficacy Endpoints in the PP Group with LB-P12.

PO4.192

Intensive Lifestyle Intervention Strategies for Improving Cardiovascular Risk in Indian Adults with Obesity

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Introduction: Obesity-driven cardiovascular (CV) disease is a major public health issue in India, characterized by traditional (hypertension, dyslipidemia) and non-traditional (inflammation, insulin resistance) risk factors. This study assessed the efficacy of intensive lifestyle intervention (ILI) in improving cardiovascular risk factors in Indian adults with obesity
Methods: This study included 305 adults with obesity (BMI ≥25 kg/m^2: WHO Asia Pacific Guidelines) who participated in a one-year online Intensive Lifestyle Intervention (ILI) program at an obesity management clinic in Pune, India, between 2021 and 2023. The intervention comprised a personalized plant-based diet, physical activity regimen, stress management, and medical management. The baseline and endline assessments included anthropometric and biochemical parameters of CV risk.
Results: The mean age of the study population was 46.3±11.0 years (71.8% female). Initially, 26% and 23% of the subjects were on statins and antihypertensive medications, respectively. Post-intervention, weight loss improved significantly (6.6%, $p<0.05$), with 14% of subjects moving to the overweight/normal BMI category. Significant improvements were noted in traditional risk factors: hypertension (≥140/90 mmHg) decreased from 16% to 11%, high triglycerides (≥150 mg/dl) decreased from 30% to 21%, high non-HDL (≥130 mg/dl) decreased from 65% to 55%, low HDL: male (≤40 mg/dl) decreased from 43% to 33.8%; female (≤50 mg/dl) decreased from 63% to 55.1%, and high TG/HDL ratio (≥3) decreased from 38.8% to 30.0% ($p<0.05$). For non-traditional risk factors, inflammatory markers and insulin resistance improved significantly, with high sensitivity C-reactive protein (hs-CRP > 3 mg/L) and homeostatic model assessment for insulin resistance (HOMA-IR ≥ 2.5) decreasing from 56.7% to 41.1% and 39.0% to 29.1%, respectively ($p<0.05$).
Conclusion: The study demonstrates that a one-year online Intensive Lifestyle Intervention (ILI) significantly improved both traditional and non-traditional cardiovascular risk factors in Indian adults with obesity, including reductions in blood pressure, triglycerides, inflammatory markers, and insulin resistance, thus highlighting its effectiveness in obesity management and cardiovascular risk reduction.

PO4.193

Optimizing Intermittent Fasting with Phentermine: A Breakthrough in Appetite Control, Fat Reduction, and Metabolic Health

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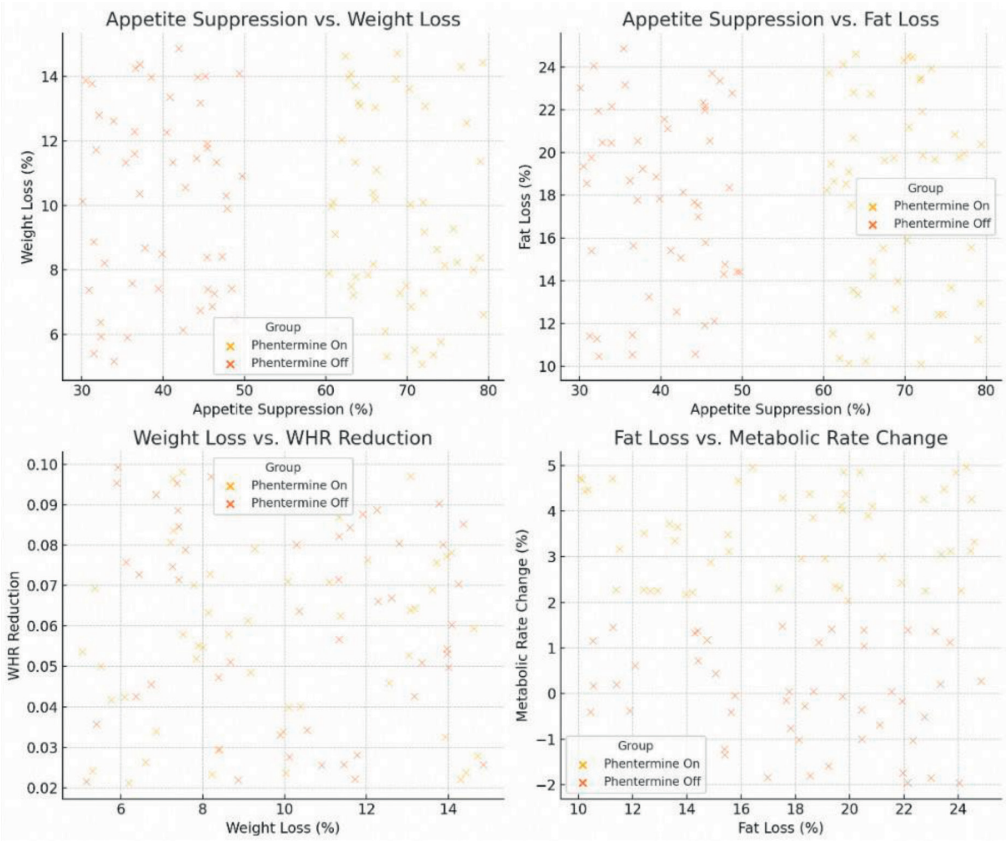
Introduction: Intermittent fasting (IF) and ketogenic diets are effective for obesity management but may be enhanced by pharmacological agents like phentermine. This study evaluates the effects of intermittent phentermine use (15 mg) combined with a 16-hour fasting protocol and ketogenic diet compared to fasting alone. Outcomes include appetite suppression, weight loss, fat loss, waist-to-hip ratio (WHR), and metabolic rate.
Methods:
Study Design
A 6-month randomized trial with 100 participants (50 per group) aged 30–45 years with BMI 28–35 kg/m².

- Phentermine + IF Group: Phentermine 15 mg during fasting hours, one month on and one month off, combined with a ketogenic diet (1600 kcal/day, 70% fats, 20% protein, 10% carbs) and 150 minutes of weekly aerobic activity.
- IF Only Group: Same fasting, diet, and exercise without phentermine.

Outcomes and Measurements

- Appetite Suppression: Visual Analog Scale (VAS).
- Body Composition: Bioelectrical impedance analysis (BIA) and 3D body scanning for weight, fat mass, and resting metabolic rate (RMR).
- Anthropometrics: Waist and hip circumferences, WHR.

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1. Appetite Suppression vs. Weight Loss: Highlights the relationship between hunger control and weight reduction, differentiated by the presence of phentermine. 2. Appetite Suppression vs. Fat Loss: Demonstrates how appetite regulation influences fat loss. 3. Weight Loss vs. WHR Reduction: Shows the impact of weight loss on waist-to-hip ratio improvements. 4. Fat Loss vs. Metabolic Rate Change: Explores how fat reduction correlates with changes in resting metabolic rate.

Fig. 1.

Statistical Analysis

Independent t-tests analyzed group differences, repeated-measures ANOVA assessed longitudinal changes, and paired t-tests compared "Phentermine On" vs. "Phentermine Off" months ($p < 0.05$).

Results:

Appetite Suppression

Phentermine significantly reduced appetite, with VAS scores decreasing by 60% in the phentermine group vs. 30% in the IF-only group ($p < 0.001$).

- Within-Group Analysis:
- "Phentermine On": 68.9% suppression (SD = 5.72).
- "Phentermine Off": 39.9% suppression (SD = 6.08).
- Paired t-test: $t = 25.15$, $p < 0.001$.

Weight and Fat Loss

- Phentermine + IF:Weight loss: 11.4 kg (10.5% of initial weight).Fat mass reduction: 18.6%.
- IF Only: Weight loss: 7.8 kg (7.2%). Fat mass reduction: 12.9% ($p < 0.01$).

Anthropometric Changes

- WHR Reduction:
- Phentermine: 0.08 (baseline 0.92 to 0.84).
- IF Only: 0.05 (baseline 0.91 to 0.86).
- Circumference Reduction:
- Waist: 11.3 cm (Phentermine) vs. 7.4 cm (IF Only).
- Hip: 8.7 cm (Phentermine) vs. 6.2 cm (IF Only).

Metabolic Rate

Phentermine preserved metabolic rate:

- RMR increased by 3% in the phentermine group, while decreasing by 1.5% in the IF-only group ($p < 0.01$).

Discussion: Phentermine amplified fasting outcomes, particularly during "Phentermine On" months, with significant appetite suppression translating into superior weight and fat loss. Its ability to preserve metabolic rate mitigates fasting-associated metabolic adaptations, enhancing long-term efficacy. Anthropometric improvements, including WHR and abdominal fat reduction, underscore its impact on visceral fat, reducing cardiometabolic risks. These findings establish phentermine as a potent adjunct to IF and ketogenic diets, optimizing results beyond lifestyle changes alone.

Conclusion: Intermittent phentermine use significantly enhances appetite suppression, weight loss, fat reduction, and metabolic health compared to fasting alone. Its intermittent administration minimizes tolerance concerns, offering a safe, effective strategy for obesity management.

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PO4.194

What are the most important research questions within prediabetes? A Priority Setting Partnership in collaboration with patients, healthcare professionals and researchers

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Introduction: Research agendas are often defined by funders and researchers. Hence, there is a risk that priorities and needs by patients and healthcare professionals (HCPs) are overlooked. Involving these stakeholders in setting the research agenda is crucial to improve quality, relevance and clinical utility. Therefore, the aim of this study was to identify the most important prediabetes research questions in collaboration with patients, relatives, HCPs, and researchers.
Methods: A modified James Lind Alliance Priority Setting Partnership methodology was conducted, following the four-step process including: 1) Gathering uncertainties, 2) Organizing uncertainties, 3) Interim priority setting, 4) Final priority setting. In each step, patients (people with prediabetes and people with Type 2 Diabetes (T2D), their relatives (family members and friends), HCPs (general practitioners, nurses and dieticians), and researchers working with prediabetes or T2D were involved. Additionally, the international relevance of the most important research questions was evaluated by members identified from relevant international organizations (EASD, EDEG, EASO, and ADA).
Results: 405 people (77% patients/relatives and 23% HCPs/researchers) submitted a total of 1142 uncertainties, which were categorized and condensed into a list of 35 research questions. 115 participants took part in the interim prioritization and 11 people participated in the final workshop. The jointly agreed top-10 list highlighted the most important research questions in prediabetes, suggesting more research on prevention strategies, risk factors, diet advice, screening, and personalized treatment. The international assessment confirmed the generalizability of the identified research questions (Figure 1). Further, it was found that patients and relatives had different priorities than researchers and HCPs. In general, diet advice and non-drug treatments were prioritised by patients, whereas pharmaceutical treatment, cross-sectional management and health economy were prioritized by HCPs.
Conclusion: This study established a list of 10 highly prioritized research questions shared between several stakeholders in the field of prediabetes. These findings are intended to guide academia, funders, and the healthcare industry in directing prediabetes research specifically to the needs of patients and HCPs, hopefully leading to improved health for people with prediabetes.

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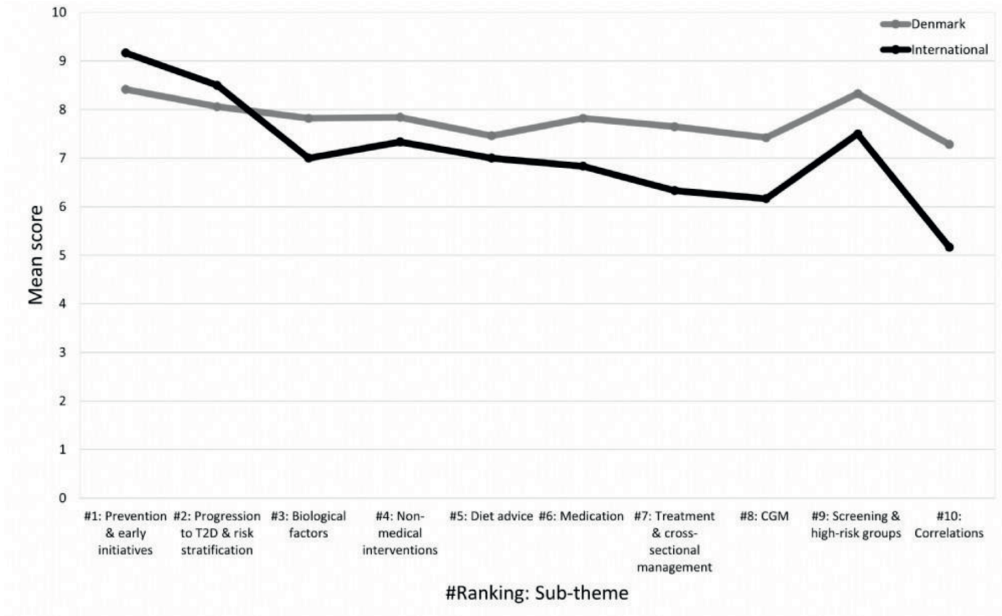
PO4.195

The overlooked role of psychological factors in obesity therapy: a narrative review

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Introduction: Current guidelines for obesity treatment primarily target the physiological mechanisms of the disease, such as calorie restriction, increased physical activity, pharmacological treatments, and bariatric surgery. While these approaches can be effective, they often overlook complex psychological factors (PF) such as emotions, experiences, and



The mean score for each question on the identified top-10 list from the Danish and international survey, respectively.

Fig. 1.

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attitudes that are essential for long-term weight maintenance. By not addressing these PF, current approaches inadvertently contribute to the stigmatization of individuals with obesity, particularly by healthcare professionals (HCPs), which further fosters self-stigma and undermines the success of treatment efforts. This narrative review highlights the importance of addressing these PF, aiming to raise awareness among HCPs, identify research gaps, and propose recommendations for more holistic and effective approaches to obesity care.
Methods: A narrative literature search was conducted to identify studies on the PF contributing to obesity and current treatment approaches. The selected literature was synthesized to examine current treatment approaches and their limitations, with particular attention given to the integration of PF in obesity management.
Results: Although psychological conditions such as binge eating disorder and depression are acknowledged in obesity treatment guidelines and the importance of interprofessional treatment is increasingly recognized, many PF of obesity remain overlooked particularly in the absence of a formal diagnosis. Among these are developmental trauma, adverse childhood experiences and major life events in adulthood, which can profoundly shape emotional regulation and coping mechanisms. Neurodevelopmental disorders such as attention-deficit/hyperactivity disorder, which often remain unrecognized in adults, can contribute to poor dietary self-regulation. Furthermore, parental feeding practices during childhood can contribute to long-term patterns of dysfunctional eating. Lastly, social beliefs and weight stigma may perpetuate feelings of inadequacy. The lack of recognition of these PF by HCPs may lead individuals to believe that weight management is solely a lack of willpower or a lifestyle choice. This misconception fosters self-stigmatization and can drive a lifelong cycle of perceived failure, reinforcing unhealthy behaviors. Addressing these complex PF requires the integration of trauma-informed care and novel interventions, which show promise in improving self-regulation, fostering healthier coping strategies, and enhancing quality of life.
Conclusion: Obesity treatment requires a paradigm shift that recognizes and addresses the PF of the disease. To achieve this goal, PF of eating behaviours, regardless of mental health diagnoses, must be integrated into standard care and into clinical guidelines. HCPs require training to recognize and address these PF, ensuring a less stigmatizing approach to care. Further research regarding screening procedures and novel treatment approaches that incorporate psychological support are warranted.

Conflict of Interest: None disclosed

Funding: No funding to report

PO4.196

Zoledronic Acid Reduces Bone Loss 1 Year After Bariatric Surgery, with Diminishing Effects at 2 Years - A randomized, placebo-controlled study

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Introduction: Bariatric surgery leads to significant bone loss and increases the risk of fractures. The aim of this study was to investigate the effects of zoledronic acid on the prevention of bone loss after bariatric surgery.
Methods: This randomized, placebo-controlled study was conducted at University Hospital of Southern Den-mark, Esbjerg. Patients undergoing bariatric surgery were randomly assigned (1:1) to receive either a single dose of zoledronic acid (5 mg) (INT) or a placebo (CON) preoperatively. Outcomes included changes in spine, femoral neck, and total hip bone mineral density (BMD) 12 and 24 months after bariatric surgery, assessed using CT (vBMD) and DXA (aBMD).
Results: Patients eligible for bariatric surgery (age: 48.9 ± 6.3, BMI: 42.3 ± 5.3, female/male: 43/16) were randomized to INT (n=31) or CON (n=28). At 12 months, a treatment effect of zoledronic acid was observed for all outcomes, resulting in increased or preserved BMD ($P<0.05$), except for femoral neck vBMD. At 24 months, the treatment effect diminished, and both groups experienced similar changes in BMD across all outcomes. Specifically, femoral neck aBMD declined by 4.7–7.0% ($P<0.01$), while total hip aBMD and vBMD declined by 3.4–7.5% ($P<0.001$) in both groups. For spine aBMD, CON showed a loss of 4.4% ($P<0.01$), but no significant between-group difference was observed for this outcome.
Conclusion: Zoledronic acid provides protective effects against bone loss 1 year after bariatric surgery, but the effect diminishes and is no longer significant 2 years post-surgery.

Conflict of Interest: None Disclosed

Funding: This study was funded by: the University of Southern Denmark (PhD Scholarship: N/A); Steno Diabetes Center Odense, Odense University Hospital Denmark, which is funded by the Novo Nordisk Foundation. (PhD Scholarship: A4850); The fund to support clinical doctoral candidates in the Region of Southern Denmark (Region Syddanmarks pulje til støtte af Ph.d.-forløb) (PhD Scholarship: J.nr.: 21/18146); The fund to support independent, strategic clinical research in the Region of Southern Denmark (Region Syddanmarks pulje for fri og strategisk Forskning) (Equipment: J.nr.: 20/14280); The A.P. Møller Foundation (Equipment: 19-L-0259); Karola Jørgensen Fond (Equipment: N/A) and lastly Aase og Ejnar Danielsens Fond (Equipment: 22-10-0272). The funding parties have no influence on the study design, study conduct, results, or dissemination.

PO4.197

Health coaches report that patients on incretin-based therapies request personalised support on medication related topics and barriers and challenges for weight management

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Vir Health Ltd (T/N Numan)

Introduction: Lifestyle counseling is recommended alongside incretin-based therapies for the treatment of obesity. It can play a critical role in supporting adherence to medication, preventing and managing side effects, supporting nutritional intake and working to establish healthier routines for long term weight and health. Digital health providers play an important role in obesity management, enabling increased access to care. Minimal research has been done on the topics requested by patients to be covered during interactions with health coaches (HCs) in digital programmes. This study examines support topics sought by patients prescribed incretin-based therapies while being supported by HCs.
Methods: A survey was conducted in December 2024 with 12 HCs from a digital obesity management programme (Numan). Collectively, they had supported over 11,000 patients on incretin-based therapies and came from diverse professional backgrounds including; nutrition, dietetics, exercise physiology and psychology. Each HC selected their top 5 patient-requested support topics from a list of 30 lifestyle-focused topics across six broad categories: medication, nutrition, activity, motivation and mindset, barriers and challenges and other. Topics were ranked based on the percentage of HCs selecting them in their top 5. These topics reflected patient-initiated interests, which was outside the HC-initiated topics of the structured programme.
Results: All HCs responded, with 17%,41% and 41% having supported patients for >12, 6-12 or <6 months respectively. Categories ranked in order (high-low) were: medication, barriers and challenges, motivation and mindset, nutrition and activity. The highest ranking individual topic was 'plateaus and weight gains' with 75% of HCs including it in their top 5. Other frequently ranked topics were 'motivation and mindset', 'patients struggling with weight loss and lifestyle facing change' (58%),

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side effect management (50%) and management of emotional hunger (42%). Additional topics such as nutrition to support weight loss, dose escalation queries and medication effectiveness and benefits each ranked at 33%. Other topics such as sleep and stress did not rank among any HCs top choices.

Conclusions: HCs reported the most common patient-initiated topics for support alongside incretin-based therapies were broadly medication related topics and individual topics of barriers and challenges to weight management, as well as motivation and mindset. Personalised support in these areas is essential to address patient needs effectively. Further research is required to reliably quantify these categories and topic areas. An AI assisted categorization platform is currently being developed and tested to support this.

PO4.198

Accuracy of existing prediction equations to assess fat free mass in type II and III obesity

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Introduction: Patients undergoing bariatric surgery often experience significant fat-free mass (FFM) loss (1), which may contribute to suboptimal weight loss, weight regain and comorbidities relapse. Monitoring FFM is crucial, but accurate assessment requires technologies like DXA, rarely available on routine clinical settings. Aims were to: 1) identify the most accurate prediction equation for estimating FFM in patients with type II-III obesity, and 2) evaluate whether existing equations reliably detect acute FFM changes following bariatric surgery.

Methods: 95 participants (BMI: 44.1 ± 4.8 kg/m²) from two centers in Spain and Portugal were assessed before and 1–2 months after bariatric surgery. Anthropometric measurements included height, weight, BMI, waist and hip circumferences following WHO guidelines. FFM was measured by DXA (Portugal: Hologic Explorer QDR; Spain: Hologic Horizon QDR). Six FFM prediction equations based on routine clinical variables (e.g., BMI, sex, age, weight, height, waist, and hip circumferences) were identified through a literature review, with inclusion restricted to equations developed using DXA as reference. Paired t-tests compared predicted FFM with DXA measurements. Linear regressions were used to evaluate predictive accuracy. Agreement between methods was assessed with Bland-Altman plots.

Results: Before surgery, participants had mean FFM of 57.4±12.4 kg. The Gallagher et al. (2) (70.6 kg), Li et al. (3) (60.1Kg), Li et al. for higher BMIs (3) (59.5 kg) and Larsson et al. (4) (58.4 kg) equations overestimated FFM (all $p<0.05$), while Larsson et al. (4) (51.0 kg) equation using waist circumference underestimated it ($p<0.01$). Janmahasatian et al. equation (5) (57.9 kg) was the only equation not showing significant differences when compared to DXA ($p=0.281$). This equation showed an R2 of 0.86 and a RMSE of 4.59. The Bland-Altman plots suggested that no bias was found for this equation (Bias: -0.514, CI: -1.46, 0.43), although the lower and upper limit of agreements were large (-9.6 to 8.6). When re-evaluating patients after rapid weight loss caused by bariatric surgery, the Janmahasatian equation remained accurate with an estimated 53.3 kg vs. 52.9 kg of FFM measured with DXA ($p=0.473$). This equation showed an R2 of 0.828 and a RMSE of 5.20. Bland-Altman plots also suggested no bias for this equation (Bias: -0.416, CI: -1.56, 0.73), although lower and upper limit of agreements were large (-11.4 to 10.6).

Conclusions: The equation developed by Janmahasatien et al. (5) seems the most accurate for predicting FFM in patients with type II-III obesity. This equation also works well after bariatric surgery but wide limits of agreement in the Bland-Altman analysis warrant the development of further specific equations for patients with type II-III obesity.

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PO4.199

The effect of a Mediterranean low-calorie diet on the hand-grip strength of adults with obesity: Results from a 12-week intervention study in Greece

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Introduction: Data from the National Epidemiological Survey show that 1/3 of Greeks are person with obesity, with a pronounced upward trend in cardiovascular morbidity and mortality. This is mainly due to the abandonment of the traditional diet and living. Weight loss diets is one of the key ways to reduce obesity but is often associated with a decrease in muscle mass. Hand Grip Strength (HGS) is essential to the maintenance of quality of life, associated with muscle mass. Epidemiological studies have shown the beneficial effect of the Mediterranean diet (MD) on the reduction of body weight, since the diet can induce satiety and includes a variety of nutrient-dense foods. The effect of the MD on weight loss has not been adequately studied in Greece and there is lack of evidence of the effect of a hypocaloric Mediterranean diet on the muscle mass of persons with obesity. Thus, the aim of this study is to investigate the effect of a hypocaloric Mediterranean diet on the HGS of persons with obesity.

Methods: 142 men and women with obesity (118 females (83.1%), body weight 111.5 ± 25.1 kg, BMI: 40.7±8.5 kg/m2, aged 50.9±11.9 years) were recruited for a 12-week hypocaloric Mediterranean diet program. The dietary restriction program was between 1800 and 2400 kcal for males and between 1400 and 1800 kcal for female participants, in order to achieve a caloric deficit for a 0.5 to 1 kg/week weight reduction. The dietary program consisted of 3 meals and 2 snacks per day. The participants' anthropometry characteristics were measured using standardized protocols,

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before and after the intervention. HGS was measured by a hydraulic hand dynamometer (Jamar). The average score of 3 successive trials of HGS (kg) for both hands were included in the analysis.
Results: After the hypocaloric Mediterranean diet, a statistically significant reduction presented in the BMI ($p<0.001$) and body weight ($p<0.001$) of the participants, while a significant increase emerged in the total HGS ($p=0.024$).
Conclusion: A short-term hypocaloric Mediterranean diet proved to be beneficial in both reducing the weight of the participants with obesity and increasing the total HGS.

PO4.200

Prevalence of MASLD, MASH and liver fibrosis in a Dutch bariatric cohort

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Introduction: The prevalence of metabolic dysfunction-associated steatotic liver disease (MASLD) and metabolic dysfunction-associated steatohepatitis (MASH) in bariatric populations has been widely studied. However, the prevalence may vary depending on the geographical location. This study aims to assess MASLD/MASH prevalence and the utility of noninvasive tests (NITs) for liver fibrosis in a Dutch cohort of bariatric surgery patients.
Materials and Methods: This study included patients undergoing bariatric surgery. At baseline, 10 NITs were performed. A liver biopsy was performed during bariatric surgery for patients with liver stiffness measurements ≥8kPa using vibration controlled transient elastography. The NAFLD Activity Score was utilized to assess histology. Statistical analysis compared NITs to histology, using sensitivity, specificity, and area under the receiver operating characteristic (AUROC) to evaluate diagnostic accuracy. MASH was defined by the presence of steatosis with lobular inflammation and ballooning, with a NAS score ≥4, with or without fibrosis. If F≥2 was present, it was defined as at-risk MASH.
Results: Among 220 patients, histological analysis in 77 patients revealed MASLD prevalence of 50,6%, with 5.3% meeting MASH criteria and 2.6% at-risk MASH criteria. Most patients had no fibrosis (67.1%), with only mild fibrosis in others (F1: 23.7%, F2: 9.2%). NITs varied in efficacy; capped MAF-5 effectively detected fibrosis stage ≥2, with AUROCs of 0.809. FIB-4 was less effective, misclassifying 18.1% of cases, while FAST and capped MAF-5 performed well for identifying at-risk MASH.
Conclusion: The prevalence of MASLD/MASH and advanced fibrosis in this Dutch cohort was lower than expected. Capped MAF-5 showed best performance for fibrosis detection, while TE and FIB-4 were less reliable. Further research is warranted to refine NIT selection for this population.

	Based on VCTE				Based on histology			
Demographics	**Total**	**No MASLD**	**MASLD**	**p-value**	**Total**	**No MASLD**	**MASLD**	**p-value**
n (%)	220 (100%)	105 (47,7%)	115 (52,3%)		77 (100%)	38 (49,3%)	39 (50,6%)	
Age, years ±SD	43,2 ± 11,5	40,7 ± 11,1	45,5 ± 11,4	0,002	44,7 ±11,0	43,4 ± 12,2	45,7 ± 9,7	0,427
Women, n(%)	177 (80,5%)	92 (87,6%)	85 (73,9%)	0,01	58 (75,3%)	33 (86,8%)	25 (64,1%)	0,021
Height, cm	169,3 ± 8,2	168,5 ± 7,6	170,1 ± 8,6	0,158	170,3 ± 8,8	168,4 ± 9,3	172,3 ± 8,0	0,054
Weight, kg	123,3 ± 20,9	121,5 ± 19,0	124,8 ± 22,5	0,238	125,8 ± 21,5	122,0 ± 17,4	129,5 ± 24,5	0,127
Waist circumference, cm	130,5 ± 13,5	127,9 ± 13,4	132,7 ± 13,3	0,008	132,5 ± 13,2	131,7 ± 12,2	133,4 ± 14,1	0,565
BMI, $kg.m^{-2}$	42,9 ± 5,7	42,7 ± 5,3	43,0 ± 6,00	0,674	43,2 ± 5,9	43,0 ± 4,5	43,5 ± 7,1	0,675
Etnicity, n (%)				0,486				0,212
Hindu	8 (3,6%)	5 (4,8%)	3 (2,6%)		2 (2,6%)	1 (2,6%)	1 (2,6%)	
Asian	1 (0,5%)	1 (1,0%)	0 (0%)		1 (1,3%)	1 (2,6%)	0 (0%)	
Caucasian	164 (74,5%)	73 (69,5%)	91 (79,1%)		57 (74,0%)	27 (71,1%)	30 (76,9%)	
Latino-american	2 (0,9%)	0 (0%)	2 (1,7%)		0 (0%)	0 (0%)	0 (0%)	
North African	9 (4,1%)	5 (4,8%)	4 (3,5%)		0 (0%)	0 (0%)	0 (0%)	
Other African	14 (6,4%)	9 (8,6%)	5 (4,3%)		9 (11,7%)	7 (18,4%)	2 (5,1%)	
Turkish	11 (5%)	6 (5,7%)	5 (4,3%)		3 (3,9%)	0 (0%)	3 (7,7%)	
Other	11 (5%)	6 (5,7%)	5 (4,3%)		5 (6,5%)	2 (5,3%)	3 (7,7%)	
Diabetes, n(%)	36 (16,3%)	15 (14,3%)	21 (18,3%)	0,426	21 (27,3%)	8 (21,1%)	13 (33,3%)	0,215
No diabetes	184 (83,6%)	90 (85,7%)	94 (81,7%)		56 (72,7%)	30 (78,9%)	26 (66,7%)	
Type 1	4 (1,8%)	3 (20,0%)	1 (4,8%)		1 (1,3%)	1 (2,6%)	0 (0%)	
Type 2	32 (14,5%)	12 (80,0%)	20 (95,2%)		20 (26,0%)	7 (18,4%)	13 (33,3%)	
Hypertension, n(%)	64 (29,1%)	25 (23,8%)	39 (33,9%)	0,099	30 (39,0%)	13 (34,2%)	17 (43,6%)	0,399
Dyslipidemia, n(%)	82 (37,3%)	40 (38,1%)	42 (36,5%)	0,809	30 (39,0%)	10 (26,3%)	20 (51,3%)	0,025
OSAS, n(%)	25 (11,4%)	14 (13,3%)	11 (9,6%)	0,379	5 (6,5%)	1 (2,6%)	4 (10,3%)	0,175

Fig. 1. Baseline characteristics Part 1.

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	Based on VCTE				Based on histology			
Laboratory measurements	**Total**	**No MASLD**	**MASLD**	**p-value**	**Total**	**No MASLD**	**MASLD**	**p-value**
Creatinine, µmol/L	71,4 ± 28,8	68,8 ± 12,7	73,8 ± 37,8	0,197	75,9 ± 45,1	67,8 ± 8,7	83,9 ± 62,2	0,119
ALT, U/L	32,2 ± 21,5	29,0 ± 20,9	35,2 ±21,6	0,032	35,8 ± 28,4	24,2 ± 9,4	47,0 ± 35,6	<0,001
AST, U/L	27,4 ± 11,6	26,1 ± 12,2	28,5 ± 11,0	0,133	30,0 ± 16,2	23,4 ± 4,4	36,2 ± 20,4	<0,001
Cholesterol, mmol/L	5,19 ± 1,03	5,06 ± 0,96	5,31 ± 1,09	0,068	5,1 ± 1,2	4,9 ± 1,1	5,3 ± 1,2	0,105
LDL-chol, mmol/L	3,18 ± 0,87	3,13 ± 0,83	3,23 ± 0,91	0,435	3,10 ± 0,92	3,01 ± 0,88	3,21 ± 0,97	0,349
HDL-chol, mmol/L	1,21 ± 0,30	1,24 ±0,33	1,19 ± 0,26	0,217	1,16 ± 0,26	1,22 ± 0,27	1,10 ± 0,24	0,046
Chol/HDL	4,48 ± 1,25	4,32 ± 1,31	4,63 ± 1,17	0,069	4,50 ± 1,16	4,06 ± 0,87	4,92 ± 1,25	<0,001
Triglycerides, mmol/L	1,84 ± 1,15	1,57 ± 1,01	2,09 ± 1,21	<0,001	1,84 ± 1,14	1,40 ± 0,64	2,27 ± 1,35	<0,001
Transferrine, g/L	2,81 ± 0,39	2,75 ± 0,40	2,87 ± 0,39	0,022	2,83 ± 0,40	2,84 ± 0,47	2,81 ± 0,32	0,771
Ferritine, µg/L	110,3 ± 103,5	100,9 ± 106,1	119,0 ± 100,8	0,194	126,7 ± 111,9	89,2 ± 70,3	163,1 ± 132,2	0,003
Iron, umol/L	15,1 ± 5,6	14,8 ± 5,6	15,4 ± 5,6	0,381	14,9 ± 4,7	13,8 ± 4,4	16,0 ± 4,8	0,041
HbA1c, mmol/mol	41,5 ± 10,5	39,4 ± 9,4	43,4 ± 11,1	0,005	45,1 ± 13,9	42,6 ± 11,2	47,4 ± 15,8	0,132
Albumin, g/L	45,6 ± 2,6	45,4 ± 2,7	45,8 ± 2,5	0,260	45,9 ± 2,5	45,3 ± 2,5	46,5 ± 2,3	0,040
Hemoglobin, mmol/L	8,7 ± 0,9	8,6 ± 0,9	8,8 ± 0,8	0,030	8,8 ± 0,8	8,6 ± 0,8	8,9 ± 0,9	0,115
Hematocrite, L/L	0,04	0,42 ± 0,04	0,43 ± 0,04	0,013	0,43 ± 0,04	0,42 ± 0,04	0,44 ± 0,04	0,119
Platelets, x10^9/L	301,2 ± 66,9	302,9 ± 61,4	299,6 ± 71,8	0,723	296,2 ± 74,5	299,1 ± 74,6	293,5 ± 75,3	0,742
White blood cells, x10^9/L	8,2 ± 2,2	8,4 ± 2,3	8,1 ± 2,1	0,366	8,3 ± 2,2	8,7 ± 2,1	7,9 ± 2,3	0,144

Fig. 2. Baseline characteristics Part 2.

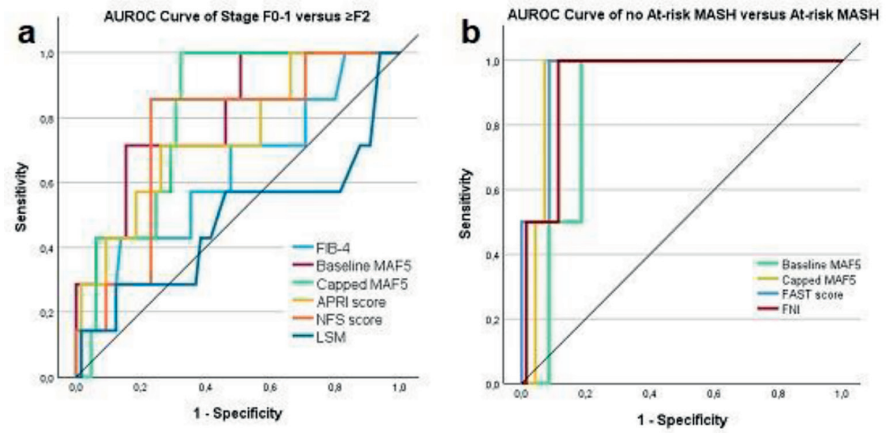
	Based on histology			
Surgery and liver biopsies	**Total**	**No MASLD**	**MASLD**	**p-value**
N (%)	77 (100%)	38 (49,3%)	39 (50,6%)	
Type of surgery				0,408
LSG	39 (50,6%)	21 (55,3%)	18 (46,2%)	
RYGB	36 (46,8%)	16 (42,1%)	20 (51,3%)	
OAGB	1 (1,3%)	1 (2,6%)	0 (0%)	
Nissen sleeve	1 (1,3%)	0 (0%)	1 (2,6%)	
NAS score ≥ 4, n(%)	6 (7,9%)	0 (0%)	6 (15,4%)	<0,001
MASH	4 (5,3%)	0 (0%)	4 (10,3%)	0,045
At-risk MASH	2 (2,6%)	0 (0%)	2 (5,1%)	0,163
Steatosis ≥ 1, n(%)	39 (50,6%)	0 (0%)	39 (100%)	
Balooning ≥ 1, n(%)	12 (15,6%)	3 (7,9%)	9 (23,1%)	0,074
Inflammation ≥ 1, n(%)	42 (54,5%)	19 (50,0%)	23 (59,0%)	0,504
Fibrosis				0,237
0, n(%)	51 (67,1%)	29 (76,3%)	22 (57,9%)	
1, n(%)	18 (23,7%)	7 (18,4%)	11 (28,9%)	
2, n(%)	7 (9,2%)	2 (5,3%)	5 (13,2%)	
3, n(%)	0 (0%)	0 (0%)	0 (0%)	
4, n(%)	0 (0%)	0 (0%)	0 (0%)	

Fig. 3. Bariatric surgery and liver biopsies.

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	Based on VCTE				Based on histology			
Non invasive tests	**Total**	**No MASLD**	**MASLD**	**p-value**	**Total**	**No MASLD**	**MASLD**	**p-value**
N (%)	220 (100%)	105 (47,7%)	115 (52,3%)		77 (100%)	38 (49,3%)	39 (50,6%)	
FIB-4 index ± SD (=211)	0,768 ± 0,337	0,723 ± 0,344	0,801 ± 0,326	0,063	0,854 ± 0,396	0,812 ± 0,432	0,894 ± 0,361	0,382
<1,3, n (%)	193 (91,5%)	94 (92,2%)	99 (90,8%)		63 (86,3%)	30 (85,7%)	33 (86,8%)	
≥ 1,3 and <2,67, n (%)	18 (8,5%)	8 (7,8%)	10 (9,2%)		10 (13,7%)	5 (14,3%)	5 (13,2%)	
≥ 2,67, n (%)	0 (0%)	0 (0%)	0 (0%)		0 (0%)	0 (0%)	0 (0%)	
Baseline MAF-5 ± SD (=211)	3,284 ± 2,365	2,758 ± 2,440	3,777 ± 2,191	0,002	3,990 ± 2,505	3,125 ± 2,348	4,787 ± 2,405	0,004
<0, n (%)	10 (4,7%)	9 (8,8%)	1 (0,9%)		1 (1,4%)	1 (2,9%)	0 (0%)	0,172
≥ 0 and <1, n (%)	27 (12,8%)	19 (18,6%)	8 (7,3%)		10 (13,9%)	7 (20,0%)	3 (7,9%)	
≥ 1, n (%)	174 (82,5%)	74 (72,5%)	100 (91,7%)		61 (84,7%)	27 (77,1%)	35 (92,1%)	
Capped MAF-5 ± SD (=211)	-0,546 ± 1,742	-0,919 ± 1,811	-0,197 ± 1,605	0,002	0,042 ± 1,988	-0,686 ± 1,845	0,712 ± 1,897	0,002
<0, n (%)	135 (64,0%)	72 (70,6%)	63 (57,8%)		38 (53,4%)	24 (68,6%)	15 (39,5%)	0,031
≥ 0 and <1, n (%)	36 (17,1%)	14 (13,7%)	22 (20,2%)		9 (12,3%)	4 (11,4%)	5 (13,2%)	
≥ 1, n (%)	40 (18,9%)	16 (15,7%)	24 (22,0%)		25 (34,2%)	7 (20,0%)	18 (47,4%)	
APRI ± SD (n=211)	0,311 ± 0,205	0,285 ± 0,152	0,323 ± 0,191	0,116	0,349 ± 0,242	0,263 ± 0,093	0,428 ± 0,304	0,003
≥ 0,918, n (%)	5 (2,4%)	2 (2,0%)	3 (2,8%)	0,706	4 (5,5%)	0 (0%)	4 (10,5%)	0,048
NFS ± SD (n=211)	-1,884 ± 1,238	-1,977 ±1,262	-1,801 ± 1,233	0,307	-1,624 ±1,328	-1,672 ± 1,488	-1,580 ± 1,180	0,769
>0,676, n(%)	2 (0,9%)	1 (1,0%)	1 (0,9%)	0,962	1 (1,4%)	1 (2,9%)	0 (0%)	0,287
CAP, dB/m (=220)	283,00 ± 50,5	240,1 ± 27,1	322,2 ± 31,5	<0,001	291,7 ±54,0	272,97 ± 49,5	310,0 ± 52,5	0,002
LSM, kPa ± SD (=220)	8,25 ± 4,49	7,74 ± 4,58	8,72 ± 4,37	0,109	11,77 ± 4,94	11,70 ± 4,87	11,84 ± 5,06	0,908
≥ 8 kPa, n(%)	93 (42,3%)	38 (36,2%)	55 (47,8%)	0,081	42 (56,8%)	19 (50,0%)	23 (63,9%)	
IQR/median preoperative (%)	18,7 ± 6,6	18,6 ± 6,5	18,9 ± 6,6	0,692	18,9 ± 6,2	19,5 ± 5,7	18,4 ± 6,7	0,468
FAST score ± SD (n=212)	0,24 ± 0,17	0,16 ± 0,13	0,31 ± 0,18	<0,001	0,34 ± 0,20	0,25 ± 0,13	0,43 ± 0,22	<0,001
≥ 0,35, n(%)	45 (21,2%)	10 (9,7%)	35 (32,1%)	<0,001	31 (41,9%)	7 (19,4%)	24 (63,2%)	<0,001
FNI ± SD	0,23 ± 0,22	0,18 ± 0,19	0,25 ± 0,19	0,013	0,29 ± 0,25	0,18 ± 0,17	0,39 ± 0,28	<0,001
≥ 0,33, n(%)	39 (18,6%)	13 (12,9%)	26 (23,9%)	0,041	21 (28,8%)	5 (14,3%)	16 (42,1%)	0,009
Agile3+ ± SD (n=211)	0,237 ± 0,219	0,188 ± 0,192	0,283 ± 0,233	0,001	0,415 ± 0,229	0,382 ± 0,223	0,447 ± 0,232	0,226
≥ 0,679, n(%)	13 (6,2%)	3 (2,9%)	10 (9,2%)	0,06	11 (15,1%)	3 (8,6%)	8 (21,1%)	0,136
Agile 4 ± SD (n=211)	0,041 ± 0,066	0,036 ± 0,064	0,046 ± 0,068	0,31	0,087 ± 0,093	0,100 ± 0,109	0,074 ± 0,074	0,224
≥ 0,565, n(%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	NA	0 (0,0%)	0 (0,0%)	0 (0,0%)	NA

Fig. 4. Results of noninvasive tests of the FONS cohort based on VCTE and liver histology.



Area Under the ROC Curve

Test Result Variable(s)	Area
FIB-4 index	0,645
Baseline MAF-5	0,809
Capped MAF-5	0,809
APRI score	0,743
NFS score	0,754
LSM	0,479

Area Under the ROC Curve

Test Result Variable(s)	Area
Baseline MAF-5	0,864
Capped MAF-5	0,943
FAST score	0,957
FNI	0,936

Optimal cutoff values

	cutoff value	sensitivity	specificity
FIB-4 index	1,26	42,9%	13,8%
Baseline MAF-5	6,043	71,4%	15,4%
Capped MAF-5	0,475	100%	32,3%
APRI score	0,351	71,4%	26,2%
NFS score	-0,708	85,7%	23,1%
LSM	14,3	28,6%	12,3%

Optimal cutoff values

	cutoff value	sensitivity	speci
Baseline MAF-5	6,15	100%	18,1
Capped MAF-5	2,69	100%	7,1
FAST score	0,63	100%	8,6
FNI	0,62	100%	11,4

AUROC curves from a) FIB-4 index, baseline MAF-5, capped MAF-5, APRI score, NFS score and Fibroscan®(LSM) for the detection of stage F≥2 and b) Baseline MAF-5, Capped MAF-5, FAST score and FNI for the detection of at-risk MASH. The performance of these tests was evaluated against histology. The diagonal line corresponds to chance alone (AUROC curve=0.50).

Fig. 5. AUROC curves of NIT's.

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PO4.201

Resistance training and protein supplementation to counteract disproportional fat-free mass loss following metabolic-bariatric surgery: rationale and design of the ENRICHED randomized controlled trial

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Background: Metabolic-bariatric surgery (MBS) is associated with substantial fat-free mass (FFM) loss. FFM is largely composed of skeletal muscle, which plays a pivotal role in metabolic health, functional capacity, and bone density. Disproportional loss of FFM, i.e. > 25-30%, after MBS negatively impacts cardiometabolic health and increases the risk of cardiovascular events and mortality. Disproportional FFM loss could, therefore, counteract the health benefits of bariatric surgery. While resistance training (RT), combined with protein supplementation, has been shown to increase skeletal muscle mass and strength in the healthy population, it remains unclear whether this combined approach can prevent disproportional FFM loss after MBS.
Methods: 400 patients scheduled to undergo MBS will be included in a multicenter randomized controlled trial. Participants are randomly allocated to the standard perioperative care program or to an enriched perioperative care program. The standard care program consists of group-based guiding sessions once every three weeks. The enriched care program consists of three months of weekly supervised whole-body RT, involving three sets of 6–15 repetitions per set at 60–75% of one-repetition maximum. This is supplemented by three weekly home-based calisthenics sessions. Additionally, participants will receive protein supplementation of 20 g during weeks 1–4, 40 g during weeks 5–8, and 60 g during weeks 9–12. After 12 weeks, the supervised training sessions will be reduced to once every two weeks, and protein supplementation will be replaced by an increased intake of protein from protein-rich food sources for an additional three months. To guide patients during this process, counselling sessions will be provided by dieticians. After six months, the participants in the enriched care group will follow the standard postoperative program. Bioelectrical impedance analysis (BIA), cardiorespiratory fitness, blood pressure, muscle strength, and blood samples to assess metabolic health will be collected preoperatively and postoperatively after three weeks, three months, six months, and 12 months. Treatment adherence will be evaluated on a weekly basis through questionnaires. Additionally, dual-energy X-ray absorptiometry and objectively measured physical activity will be collected in a subgroup of 100 patients (50 patients per group).
Results: The primary outcome of this study is the difference between the enriched care group and the standard care group in the proportion of patients with disproportional FFM loss (≥30 %) three months post-MBS. Secondary endpoints include differences in BIA, metabolic health, muscle strength and function, cardiorespiratory fitness, health-related quality of life, gastrointestinal discomfort, treatment satisfaction, and cost-effectiveness of the intervention.
Conclusion: This study will provide a comprehensive assessment of the effectiveness and feasibility of resistance exercise combined with protein supplementation on disproportional FFM loss in MBS patients. The outcomes can be used in clinical guidelines and personalized post-MBS treatment.

PO4.202

A critical assessment of public perception and scientific understanding of obesity in the UK

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Vir Health Ltd (T/N Numan)

Purpose: This study evaluates the prevailing public perceptions of obesity in the UK and compares them to current medical and scientific understandings, with the goal of identifying knowledge gaps that influence public attitudes, treatment acceptance and health policy.
Method: A quantitative survey of 1,000 UK adults was conducted in September 2024, designed to be nationally representative in terms of age, sex, geographical distribution, and socio-economic status. The survey explored public beliefs about obesity, its perceived causes and attitudes towards medical treatment interventions.
Results: Data analysis provided insights with confidence levels ranging from 85% to 95% and margin error of ±3.1%. Findings revealed a significant disconnect between public perception and scientific understanding. Over half of respondents (57%) believed obesity was a personal choice, primarily attributing it to poor diet and lack of exercise. Only 10% identified socio-economic status as a key factor, and less than 10% recognised the role of genetics. Respondents who viewed obesity as a choice were less supportive of medical treatments and were more sceptical of interventions like injected medications, with nearly 40% considering such treatments as 'cheating.'
Public awareness of modern medical treatments was shown to be low, with only 7.5% familiar with recently approved anti-obesity medications. This contrasts sharply with the growing medical consensus that obesity is a chronic disease driven by complex factors, including genetics, environment and socio-economics.
Conclusion: This study underscores the urgent need for public education to align perceptions with medical and scientific understanding. Addressing this perception gap is essential to increase awareness and acceptance of evidence-based, effective obesity treatments and policy initiatives. In addition, bridging this gap is vital to address and reduce the powerful influence of weight-related stigma and bias, which has negative health and wellbeing consequences for individuals and wider society. We recommend enhanced education, multi-sector collaboration and targeted policy changes to support comprehensive obesity management.

PO4.203

HTA: A key hurdle to gaining broad access to novel treatments for obesity

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Introduction: Glucagon-like peptide-1 receptor agonists (GLP-1RAs) offer a considerable opportunity to transform obesity management. The rising rates of obesity and related complications highlight an unmet need for the use of pharmacologic interventions, adjunct to diet and exercise, to manage this trend and improve patient outcomes. Despite this, health technology assessment (HTA) bodies and payers remain hesitant to reimburse GLP-1RAs. Here we investigate HTA appraisals from six markets to understand differences in how the clinical and economic evidence for GLP-1RAs is perceived. The findings provide insights into barriers to reimbursement and how this can vary based on assessment approach and other market specific factors.
Methods: We conducted a focused review of the reimbursement status and HTA appraisals of three GLP-1RAs (liraglutide, semaglutide, and tirzepatide) across six markets with publicly funded health systems (Denmark, France, Spain, England, Canada, and Australia). The chosen markets represent a mix of payer archetypes and offer a global perspective. Only GLP-1RAs authorised for obesity since 2015 were included in the analysis. Eleven HTA appraisals were analysed.

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Results: Of the three GLP-1RAs studied, none received full reimbursement in any market and semaglutide was the only product assessed across all markets. The French HTA agency granted restricted reimbursement of semaglutide, whilst the English HTA body recommended restricted reimbursement of all three drugs. Across markets, evidence analysed was mostly the same for each drug. HTA agencies across markets cited similar criticisms in their assessments, namely uncertainty regarding the durability of weight loss benefit and the impact on long-term outcomes such as cardiovascular disease (CVD), mortality, and applicability of the trial population to clinical practice. Further criticisms of the evidence were reflective of the market in which the drug was being assessed. Cost-effectiveness markets (UK, Canada, Australia) highlighted the uncertainty of the treatments' cost-effectiveness owing to the use of short-term, surrogate endpoints. In budget impact markets (Spain, Denmark), evidence demonstrating the requirement for chronic use of GLP-1RAs and the drug price versus its therapeutic value hindered access. In the French comparative clinical effectiveness market, semaglutide's lack of superiority versus placebo for cardiovascular death and modest reduction in CV risk, limited its perceived value.

Conclusion: Overall, payers and HTA agencies recognise the need for pharmacologic interventions in obesity management. Access, however, is often restricted based on payer-defined value which is reflective of market-specific priorities e.g. economic impact or comparative clinical benefit, which are then reflected in the critique of the evidence by the respective agencies. Therefore, despite some alignment on key evidence gaps and criticisms, the value and significance of evidence offered varies between markets. As a result, evidence should be tailored to reflect market-specific priorities to enable broader patient access that is reflective of the approved label.

PO4.204

Gut Microbiota Enterotypes as Personalized Nutrition Tools in Metabolic Dysfunction-Associated Steatotic Liver Disease

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Introduction: Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD), recognized as the hepatic manifestation of metabolic syndrome, has been linked to gut microbiota alterations[1,2]. Emerging evidence suggests that gut microbial profiles, or enterotypes, may influence metabolic responses to specific dietary treatments[3,4]. This study aimed to characterize microbial enterotypes, assess their impact on weight loss, and explore their potential as precision nutrition tools.

Methods: Ninety-eight subjects with MASLD were randomized into two dietary strategies (AHA and FLiO) and followed for six months. Gut microbial composition was analyzed via 16S rRNA gene sequencing. Clustering techniques were employed to define enterotypes, and mixed models were used to evaluate their influence on weight loss and the interaction between diet and enterotype.

Results: Participants were clustered into two distinct enterotypes. Enterotype 1 was characterized by high Prevotella abundance, while Enterotype 2 showed higher Bacteroides abundance. Enterotype 2 achieved significantly greater weight loss compared to Enterotype 1 (11.2% vs. 8.8%). Furthermore, a significant interaction revealed that subjects in Enterotype 2 experienced superior weight loss when following the FLiO diet compared to the AHA diet (13.0% vs. 9.7%). In contrast, subjects in Enterotype 1 exhibited similar weight loss regardless of diet assignment.

Conclusion: Gut microbiota enterotypes significantly influence weight loss and dietary responses, underscoring their potential as personalized nutrition tools. These findings emphasize the role of microbial composition in shaping metabolic outcomes and present an opportunity to develop targeted strategies for optimizing patient treatment responses.

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PO4.205

Improved Mental Health After 4 Months Treatment with the GLP-1 Analogue Liraglutide

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Introduction: Obesity is commonly associated with mental health issues, including symptoms of depression and anxiety as well as impaired psychological wellbeing. The glucagon-like peptide-1 (GLP-1) analogue liraglutide is effective in promoting weight loss, but its impact on mental health outcomes has not been fully explored. This study aimed to evaluate the short-term effects of liraglutide on mental health and psychological well-being in patients with obesity, as well as potential associations between weight loss and changes in mental health parameters.

Methods: We evaluated 72 patients with obesity (75% women) treated with liraglutide. Mental health was assessed using the Hospital Anxiety and Depression Scale ('HADS', range 0-42 for total score, 0-21 for subscales of anxiety and depression, available for N=44 patients, 73% women) at baseline (T0) and after 4 months (T1, including the initial uptitrating phase of 4 weeks and the subsequent 3 months of treatment with the highest tolerable dose). Clinically relevant symptoms of depression and anxiety were defined as a score >8 on the respective subscale. Psychological well-being was evaluated via the OBESI-Q questionnaire (range 10-40, at both time points available for N=70 patients, 76% women). At both time points, we also assessed body weight and body mass index (BMI).

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Results: After 4 months of liraglutide treatment, body weight (-7.4 ±5.7 kg) and BMI (-2.5 ±1.9 kg/m2) were significantly reduced, along with a reduction in waist circumference (-5.0 ±9.3 cm), all p<0.001. We saw significant decreases in the HADS total score (-2 ±5) as well as depression score (-1 ±3) and anxiety score (-1 ±3, all p<0.05). Notably, after treatment, there was a decreased number of patients with clinical levels of depression (n=18 (41%) at T0 vs n=12 (27%) at T1, p<0.1), and anxiety (n=26 (59%) at T0 vs n=19 (43%) at T1, p<0.05). OBESI-Q psychological wellbeing increased significantly (+2 ±6, p<0.01). Changes in all mental health parameters tended to correlate with changes in BMI (all p<0.1).
Conclusion: In patients with obesity, we observed improvements in mental health and psychological well-being after 4 months of liraglutide treatment at the highest tolerable dose. Those changes were paralleled by the changes in BMI, suggesting that the improvements are at least partly mediated by weight loss.

PO4.206

Exercise improves cardiorespiratory fitness and functional performance during weight loss maintenance with GLP-1 receptor agonist treatment

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Introduction: Incretin-based medications, such as glucagon-like peptide-1 receptor agonists (GLP-1 RA), are effective for weight loss but also reduce fat-free mass, raising concerns about potential detrimental effects on cardiorespiratory fitness, muscle function, and functional performance.
Methods: This is a secondary analysis of the S-LiTE trial (NCT04122716), which involved 195 adults with obesity who completed an 8-week low-calorie diet and were subsequently randomized (1:1:1:1 ratio) into four groups for 52 weeks: moderate-to-vigorous-intensity exercise program plus placebo (exercise alone), GLP-1 RA liraglutide 3 mg once-daily plus usual activity (liraglutide alone), exercise plus liraglutide (combination treatment), or placebo plus usual activity (placebo). Key secondary outcomes for the current analyses were change from randomization to end of treatment (week 52) in: 1) cardiorespiratory fitness (peak oxygen consumption normalized to fat-free mass (FFM)); 2) functional performance (time to ascend and descend an 11-step stairway twice); and 3) muscle strength (isometric knee extensor peak torque). The results for the primary outcome, change in body weight from randomization to week 52, have been published: after the low-calorie diet-induced mean weight loss of 13.1 kg, mean weight changes were +6.1 kg with placebo, +2.0 kg with exercise alone, -0.7 kg with liraglutide alone, and -3.4 kg with the combination treatment.
Results: 52 weeks after randomization, the combination of exercise and liraglutide increased cardiorespiratory fitness by 3.1 ml/min/kg FFM [95%CI, 0.6 to 5.6] vs. liraglutide alone and by 5.3 ml/min/kg FFM [2.8 to 7.9] vs. placebo and decreased the time to complete the stair climb test by 1.2 s [0.6 to 1.9] vs. liraglutide alone and by 0.8 s [0.2 to 1.4] vs. placebo. Exercise alone led to similar improvements in cardiorespiratory fitness and functional performance as the combination treatment, and the effect was significantly greater than that elicited by liraglutide alone or placebo. Liraglutide alone did not improve cardiorespiratory fitness nor functional performance compared with placebo. Absolute muscle strength did not change significantly in any of the groups. Relative to body weight, muscle strength increased with the three active treatments compared with placebo due to reduced weight: 0.15 newton meter (Nm)/kg [0.01 to 0.28] for exercise alone, 0.19 Nm/kg [0.06 to 32] for liraglutide alone, and 0.24 Nm/kg [0.10 to 0.37] for the combination treatment.
Conclusion: Moderate-to-vigorous-intensity exercise during GLP-1 RA treatment for weight maintenance improved cardiorespiratory fitness and functional performance and increased relative muscle strength despite additional weight loss. In contrast, GLP-1 RA treatment alone did not improve cardiorespiratory fitness nor functional performance. These findings highlight the importance of incorporating structured exercise into medical obesity treatments to optimize physical fitness and function during weight loss management.

PO4.207

Promoting positive mental health for sustainable eating behaviors: the PROMISE study in patients with obesity

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Background: A significant increase in obesity rates, strongly associated with unhealthy and non-sustainable eating, has been observed in the last decades. Along with unhealthy dietary choices, several psychological issues including altered psychological well-being levels and dysfunctional eating styles are often observed in this clinical population. Despite the existence of standardised treatments for obesity, these factors often hinder the achievement of treatment goals.
This study aims at testing the effects and the effectiveness, both post-treatment (T1) and at 1-month follow-up (T2), of a psychological group intervention based on the principles of Well-Being Therapy (WBT) combined with a Sustainable and Healthy Eating Education (SHEE), compared to Healthy Eating Education (HEE) only, in terms of BMI reduction and promotion of more sustainable and healthy eating behaviors and optimal psychological functioning in patients with obesity.
Methods: 53 patients (mean age 52±12.92) recruited from Sant'Orsola Hospital in Bologna were randomly assigned to the experimental group (WBT+SHEE) (n=25) and to the control group (HEE) (n=28). To assess anthropometric variables, eating habits and psychological functioning at baseline (T0) and follow-ups (T1 and T2), both groups filled-in a self-report online questionnaire including the Sustainable and Healthy Dietary Behaviors (SHDB) questionnaire, the Dutch Eating Behavior Questionnaire (DEBQ), the Psychological Well-Being Scales (PWBs) and the 21-item Depression and Anxiety Stress Scale (DASS-21).
Results: Although a significant interaction between time and group did not emerge, descriptive statistics showed that patients in the WBT+SHEE group decreased their BMI from T0 to T2, while patients in the HEE group did not. A significant main effect of time emerged in both groups for DASS-stress (F=6.39, p=0.01), with a reduction from T1 to T2 (p=0.01), and for DEBQ-external eating (F=5.02, p=0.02), with a reduction from T0 to T1 (p=0.04) and T2 (p=0.02). In the WBT+SHEE group, a significant interaction between time and group emerged in SHDB-food choices (F=4.9, p=0.02), with an increase from T0 to T2 (p=0.04), and in SHDB-food disposal (F=7.06, p=0.006), with an increase from T0 to T1 (p=0.01). Significant changes in PWB were not observed.
Conclusions: Descriptive statistics showed a BMI reduction in the WBT+SHEE group only. The WBT+SHEE group significantly increased sustainable eating behaviors as compared to the HEE group and improved psychological functioning in terms of eating styles and psychological distress similarly to the HEE group. Thus, adding a psychological training promoting positive psychological functioning and functional and more sustainable eating patterns could be useful to address both physical and mental health problems in patients with obesity as compared to the usual care mostly focusing on nutritional education only.

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PO4.208

Prevalence of eating disorder symptoms in women with lipedema. Exploring the relationship between hedonic hunger and consumption of high-fat foods

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Introduction: Lipedema is a chronic disease, primarily affecting women. The disease is characterized by accumulation of fibrotic subcutaneous adipose tissue, and closely associated with symptoms as tenderness and pain. Women with lipedema report a reduced quality of life and may have an increased risk of developing eating disorders, due the reduced efficacy of traditional weight loss intervention, as well as discrimination, stigma, and body image.
Aim: The objective was to estimate a prevalence of eating disorders symptoms in a population of females with lipedema and obesity, and to investigate potential association between hedonic hunger and consumption of different high fat food groups.
Methods: This is a cross-sectional analysis of the LIPODIET study conducted between 2021 and 2023 at St. Olav hospital in Trondheim, Norway. The inclusions criteria were females diagnosed with lipoedema and obesity. Exclusion criteria included a known eating disorder, currently enrolled in lipedema/obesity treatment programs, previous bariatric surgery, or medication known to affect body weigh were excluded. Eating disorder symptoms was measured by the EDE-Q (The Eating Disorder Examination-Questionnaire 6.0) and hedonic hunger by The Power Of Food Scale. Food intakes were assessed using pre-coded food diaries. To assess correlation between high fat foods and hedonic hunger, foods with fat content ≥ 10% were categorized into different high fat food groups.
Results: A total of 60 participants were included, with an average BMI of 36.9 ± 4.9 kg/m2 and mean age of 47.3 ± 10.9 years. The EDE-Q global score was 2.2 ± 0.8, and 21% of the participants exceeded the cutoff score for eating disorder symptoms (≥ 2.8). Further, 78% had a score ≥ 2.8 in the weight concern scale and 90% in the shape concern scale. No significant correlation was found between EDE-Q scores and BMI, lipedema stage or age. Significant positive correlations were found between "Food present" and sweet high fat foods ($r=0.36$, $p < 0.01$), and salty high fat foods ($r=0.35$, $p < 0.01$).
Conclusion: An estimated prevalence of 21% was found for eating disorder symptoms in a population of females with obesity and lipedema. This seems to be driven by increased concerns about body shape and weight. Hedonic hunger was associated with a greater consumption of sweet and salty high fat foods.

Conflict of Interest: None disclosed

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PO4.209

Cultural Translation and Validation of the Stigmatizing Situations Inventory Brief (SSI-B) to European Portuguese

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Introduction: Stigma is a tendency to exclude people perceived different by society. It can be external or discrimination, and internal or self-stigma. Weight stigma is an increasing problem with prevalence similar to racial discrimination. There are a variety of tool to assess stigma, and weight stigma in particular, including the "Weight Self-Stigma Questionnaire", which has been translated into European Portuguese. However, there was a lack of a tool in European Portuguese to assess external stigma. Therefore, the aim of this study was to translation, validation and cultural adaptation of the Stigmatizing Situations Inventory Brief (SSI-B) questionnaire into European Portuguese.
Methods: Cross sectional study by presentation of two questionnaires to patients with obesity followed at a multidisciplinary obesity treatment clinic: SSI-B questionnaire and the validated translated Portuguese version of the Everyday Discrimination Scale (Escala de Discriminação Quotidiana).
Direct translation followed reviewing, back-translation, comparison, and pilot testing were performed. Retest was done 1 month after the baseline. The following psychometric properties were assessed: convergent validity using the Spearman r correlation coefficient between SSI-B and the Everyday Discrimination Scale; internal consistency based on Cronbach alpha coefficient; and reproducibility between test and retest through Spearman r correlation coefficient and intraclass correlation coefficient (ICC).
Results: A total of 175 patients were included, with a mean age of 47±11 years old and mean BMI was 43±6kg/m2. Scores for stigma were on average 21±18 for the SSI-B and 9±9 for the Everyday Discrimination Scale.
Regarding the psychometric properties, convergent validity yielded a Spearman's r coefficient of 0.727, the Cronbach alpha coefficient for internal consistency was 0.88 and reproducibility produced a Spearman's r coefficient of 0.7 and a ICC of 0.699.
Conclusion: This translation has acceptable psychometric properties, with good convergent validity and internal consistency and moderate reproducibility.

PO4.210

Predictors of patient dropout in obesity treatment programs

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Introduction: Patient retention in obesity treatment programs is critical for achieving positive health outcomes. Identifying predictors of dropout can help in designing targeted strategies to improve retention and program efficacy. This study evaluates the demographic and clinical factors associated with early dropout in a cohort of pediatric and adolescent patients.
Methods: Using data from 3078 patients enrolled in a therapeutic obesity program "6-10-14 for Health", demographic data (age, sex) and baseline clinical measurements (BMI, waist-to-hip ratio, and fat mass percentage) were compared between patients completing versus discontinuing the program after the first visit. Logistic regression was employed to identify significant predictors of dropout, while survival analysis methods were

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used to model time to dropout across visits. Missing data were addressed using multiple imputation to enhance statistical reliability.
Results: Among the cohort, 1013 patients (32.9%) failed to attend follow-up visits 2 and 3. Dropout was more common in patients with higher initial BMI (mean 26.4) and male sex (59%). Waist-to-hip ratios did not significantly differ between groups ($p > 0.05$), while higher baseline systolic blood pressure readings correlated with dropout risk ($p < 0.01$). Age and socio-demographic factors also influenced adherence patterns, with older adolescents being more likely to discontinue participation.
Conclusion: High initial BMI and elevated blood pressure are significant predictors of dropout in obesity treatment programs. Addressing these factors through personalized counseling and early engagement strategies may enhance retention. Targeting male patients and older adolescents with tailored interventions could further improve program outcomes.

PO4.211

Impact of new and reformulated food products on acceptance, satisfaction and eating behaviour in adults living with overweight or obesity: PLENTYFOOD product screening trial study protocol

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Introduction: Obesity is characterised by a dysregulation in the homeostatic control of appetite, resulting in reduced satiation (the feeling of fullness leading to meal termination) and delayed satiety (the feeling of fullness affecting meal frequency). In addition, a prevailing hedonic intake of nutrient poor, highly palatable foods, may lead to concurrent nutrient depletion despite the presence of obesity. In this context, the development of nutrient-rich food products with improved satiating power, attending also to sex and gender differences, represents a promising strategy to help individuals prone to obesity cope with an ever-growing obesogenic environment.
Methods: Between 90 and 120 participants with overweight or obesity will take part in a randomized controlled crossover intervention exploring the impact of 4 to 8 newly developed or reformulated food products and their corresponding controls, consumed *ad libitum* at lunch time in their workplace. The products are being developed by local commercial partners prioritising sustainable ingredient sources and new technological approaches to enhance the rheological and nutritional properties of the products, while maintaining their sensory appeal. Product acceptance and overall satisfaction, expected satiety, subjective appetite and satiety before and after consumption of the products will be measured using visual analogue scales. Objective satiation (how much product is eaten) will be measured using the concurrent intake test with a portable food scale. Energy compensation will be calculated from an 8 h food consumption record. Post-intake (24h) gastro-intestinal symptoms will be monitored via an on-line survey.
Results: The results of this trial will be used to select the most promising reformulated food product(s) in terms of satiating capacity, acceptability and gastro-intestinal symptoms, to be explored in a future clinical trial. The present study will also provide initial validation of new technological approaches for improving and quantifying product satiety at consumer level in the target population.
Conclusions: A product screening trial to characterise the satiating properties, acceptance and satisfaction of new/reformulated food products for individuals with overweight or obesity will allow initial validation of technological and empirical approaches in the target population.

Conflicts of interest: JO, MA, CS, MAC, AC, ALML, IB and LV are employees of their respective food or ingredient companies. The rest of authors declare no conflicts.

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PO4.212

Exploring the Impact of Food-Derived MicroRNAs on Obesity and Associated Disorders

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Introduction: Food intake is a key factor in the pathogenesis of obesity. While high-fat and high-sugar diets contribute to the development of obesity, phytochemical-rich foods exhibit notable effects in mitigating this condition. Additionally, epigenetic mechanisms influence obesity by mediating the interaction between environmental factors and genetic variation patterns. This review explores the impact of food-derived microRNAs on obesity and its associated diseases.
Methods: We conducted a comprehensive literature search covering studies published up to January 2025. The search utilized four databases (PubMed, Web of Science, Scopus, and Cochrane) using the keywords 'Food-Derived MicroRNAs', 'Obesity', 'Diet' 'Food', 'Nutriepigenomics'. Two independent reviewers carrying out both the screening and data extraction phases.
Results: MicroRNAs play a critical role in regulating gene expression at both transcriptional and translational levels, influencing the pathogenesis of various chronic diseases, including obesity, endocrine disorders, cardiovascular diseases, metabolic syndrome, and diabetes. These non-coding RNA molecules help restore homeostasis during sudden environmental changes and reprogram gene expression to enable cellular adaptation under prolonged and severe stress conditions. Recent research has revealed that microRNAs present in consumed foods can directly modulate the expression of endogenous genes, highlighting their potential role in disease regulation and prevention.
Conclusion: In addition to food components such as fat, sugar, protein, and vitamins, the microRNAs present in foods may also influence obesity and obesity-related diseases by directly or indirectly affecting metabolism. However, further studies are needed to better understand and validate their role in these processes.

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PO4.213

The effectiveness of *Smarter Pregnancy Plus*, a digital lifestyle intervention for pregnant women with obesity: Study protocol for the HYGEIA randomized controlled trial

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Background: Maternal obesity during pregnancy poses a significant public health challenge, elevating the risk of adverse maternal and neonatal outcomes, including cardiovascular and metabolic (CVM) complications such as gestational diabetes and hypertensive disorders. Integrated and tailored lifestyle interventions present a promising strategy to mitigate these risks and improve health outcomes for women in these vulnerable conditions.
Objective: To investigate the effectiveness of the Smarter Pregnancy Plus (SP+) mobile application, a digital lifestyle coaching intervention developed for pregnant women with obesity in cocreation with them and healthcare professionals. The primary aim is to reduce the incidence of CVM complications. Secondary aims are 1) to enhance maternal and neonatal health outcomes, 2) to determine the cost-efficiency of the intervention and 3) to develop a scalable framework for nationwide implementation in the Dutch healthcare system.
Methods: The HYGEIA trial is a multicenter, two-arm randomized controlled trial. We aim to recruit 930 pregnant women with a body mass index (BMI) ≥30 kg/m² and a singleton pregnancy of ≤14 weeks gestation. Participants will be randomized 1:1 to the intervention group (n=465) or the control group (n=465). The intervention group will receive six months of digital coaching through the SP+ mobile application, supplemented by one or two video consultations. SP+ provides evidence-based coaching on nutrition, physical activity, mental health, folic acid and vitamin D supplement use, and smoking and alcohol cessation. The control group will receive care as usual. The primary outcome is the incidence of CVM complications, assessed using a composite score that includes hypertensive pregnancy complications, gestational diabetes, and worsening of pre-existing chronic hypertension or diabetes. Secondary outcomes include changes in lifestyle risk scores, maternal and neonatal outcomes and cost-effectiveness. Tertiary outcomes involve patient satisfaction, provider feasibility and a roadmap for implementation. Data collection combines validated questionnaires, electronic medical records, cost analyses via time-driven activity-based costing and stakeholder interviews and group sessions, guided by the NASSS-framework.
Discussion: The HYGEIA trial aims to provide critical evidence on the feasibility, effectiveness, and cost-efficiency of SP+ as a digital lifestyle intervention for pregnant women with obesity. If successful, SP+ could transform routine obstetric care by improving maternal and neonatal health while reducing healthcare costs.

PO4.214

The association between ultra-processed food intake and anthropometric and metabolic parameters, stress and eating behaviour during a Combined Lifestyle Intervention

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Introduction: High consumption of Ultra Processed Foods (UPF) has been associated with an increased risk of obesity. Whether lowering UPF intake during a Combined Lifestyle Intervention (CLI) is helpful in combating obesity is not yet known. The objective of this study was to investigate the association of UPF intake and anthropometric/metabolic parameters, stress and eating behaviour during a 1.5-year CLI.
Methods: Data of 126 adults living with obesity undergoing a CLI with cognitive behavioural therapy at the Obesity Centre CGG, Rotterdam, The Netherlands was collected at start, after 10 weeks and 1.5 years. Food intake was measured by a 3-day food diary. To quantify UPF intake, the records were classified into the four NOVA categories, based on total consumed energy. Anthropometric and metabolic parameters were measured at the outpatient clinic using standard clinical procedures. Both biological (cortisol and cortisone in hair) and perceived (Perceived Stress Scale) stress levels were measured. Eating behavior was assessed using the Dutch Eating Behavior Questionnaire and the General Food Craving Questionnaire Trait. Marginal mixed models were performed to explore associations between UPF intake and the outcomes at all three timepoints, corrected for age and sex.
Results: After 1,5-year CLI, the participants lost a mean of 6.6 kg of weight (p<0.001). UPF intake decreased significantly from 57,5% at baseline to 52.8% after 1.5 years (p=0.002). Also, an increase in unprocessed food intake was observed from 29.0% to 35.9% (p<0.001). UPF intake was positively associated with fat mass (estimate=0.033, p=0.016), perceived stress scores (estimate=0.061, p=0.05), external eating (estimate=0.006; p=0.018) at alle time points. UPF intake was also positively associated with BMI (estimate=0.034, p<0.001), waist circumference (estimate=0.134, p<0.001) and negatively associated with restrained eating behavior (estimate=-0.008, p<0.003). These changes were significantly over time: a decrease in UPF was associated with an increase in restrained eating behaviour (estimate= 0; p=0.05) and a decrease in BMI and waist circumference (estimate = -0.001; p=0.042 and estimate = -0.002 p=0.003, respectively). No associations were observed between UPF and blood pressure, glucose, insulin, percentage lean mass, biological stress measures emotional eating and food cravings.
Conclusion: We found that a CLI led to significant weight loss, which was associated with a reduction in UPF intake. A lower UPF intake over time was associated with lower BMI, waist circumference and more restrained eating. Whether actively advising on reduction in UPF in a CLI can lead to better outcomes deserves further study.

PO4.215

Improving Body Composition and Diabetes Outcomes through Structured Lifestyle Interventions in Indian Women with Type 2 Diabetes

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Background: Approximately 23% of urban Indian women are overweight or obese, highlighting a significant health burden and the need for effective interventions. This study evaluates the impact of a one-year structured intensive lifestyle intervention (ILI) on weight loss, body composition, and diabetes remission, offering evidence for comprehensive obesity and T2D management approaches in Indian women.
Methods: This study included 305 women with T2D (age >30 years; BMI >25 kg/m²) enrolled for a one-year ILI at Freedom from Diabetes clinic in Pune, India. Data on medical history, biochemical parameters, and bioimpedance analysis (weight, BMI, total body fat, subcutaneous fat, visceral fat, and skeletal muscle mass using a Karada scan) were recorded. The intervention encompassed 1) a plant-based low-calorie diet; 2) phasewise exercises targeting lymphatic circulation, muscle activation, strength training, flexibility, stamina-building, and muscle-building; 3) psychological support to address stress; and 4) medical management.
Results: Baseline characteristics included mean age 57.4±10.2 years, diabetes duration 13.2±6.5 years, BMI 29.6±3.6 kg/m², and fat percentage 39.6±3.6. Post-intervention, 21.3% of participants shifted to overweight (23 to 24.9 kg/m²) and 9.3% to normal BMI category (18.5 to 22.9 kg/m²). Significant reductions were seen in weight (-5.5%), total fat (-3%), visceral fat (-14%), and subcutaneous fat (-5.1%), with a 2.1% increase in skeletal

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muscle mass (p<0.001). Weight loss correlated positively with reductions in total fat (r=0.534), visceral fat (r=0.643), and subcutaneous fat (r=0.616), but negatively with skeletal muscle mass (r=-0.358). Diabetes remission (maintaining glycosylated haemoglobin (HbA1C) <6.5% without use of glucose-lowering drugs) occurred in 15.7% of patients, with median HbA1c levels improving from 7.7% (Interquartile range (IQR) 2) at baseline to 7% (IQR 1.7) (p<0.001) post intervention.
Conclusion: A structured, intensive lifestyle intervention comprising a plant-based diet, exercise, psychological support, and medical management led to significant improvements in weight, body composition, and glycaemic control among Indian women with T2D, with 15.7% achieving diabetes remission. These findings underscore the effectiveness of comprehensive lifestyle modifications in managing obesity and T2D in this population.

Conflict of Interest: None to declare.

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PO4.216

Pregnancy and neonatal outcomes after bariatric surgery

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Background: 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.
Conclusion: 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.

PO4.217

Exercise and nutrition for the prevention of lean mass loss in patients with obesity treated with semaglutide: Rationale, design and methodology of the SEMAFIT study

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Introduction: Semaglutide has revolutionized the treatment of obesity, with mean weight loss exceeding 15%. However, ≈40% of the lost weight corresponds to lean mass, which might bring undesired consequences for the patient's health. There is an urgent need of developing strategies for mitigating this issue. Therefore, the aim of the SEMAFIT study is to

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determine the effect of an intervention combining resistance training and adequate dietary protein intake on lean mass of patients with obesity treated with semaglutide.

Methods: Patients with obesity and without diabetes will participate in this randomized controlled trial during the first 26 weeks of semaglutide treatment. One hundred participants will be randomized to a usual care (control) group or to an intervention group. The latter will be subjected to resistance training and a nutritional intervention ensuring adequate protein intake. Participants will complete 2-3 training sessions per week, to achieve 8-12 sets/week per basic movement patterns. The training program will be personalized and tailored to maximizing muscle hypertrophy: 8-12 repetitions per set, at an intensity of 70-85% repetition maximum, and 1-3 repetitions in reserve. Participants will be instructed to follow an exchange diet ensuring 1.8g of protein/kg of lean mass, under the supervision of a trained dietitian. The primary outcome is the change in lean mass assessed by dual X-ray absorptiometry (DXA). Secondary outcomes include: body weight and composition (i.e., skeletal muscle mass and ectopic fat depots assessed by magnetic resonance imaging; bone mineral density and total fat mass by DXA); cardiovascular risk factors (blood test and pressure); glycaemic control (oral glucose tolerance test); resting metabolic rate and nutrient oxidation (indirect calorimetry); muscle strength (handgrip and isokinetic knee strength); cardiorespiratory fitness (maximum effort test); energy efficiency and maximal oxygen consumption and fat oxidation (submaximal stress test); dietary habits (24-hour dietary recalls and food frequency questionnaires); appetite-related sensations (visual analogue scales) and eating behaviour (questionnaires); and physical activity and sleep habits (accelerometry). In addition, we will collect skeletal muscle and adipose tissue biopsies to explore potential changes on these tissues' anatomy and molecular signature. Adverse events will be carefully monitored throughout the study.

Results: We hypothesize that the SEMAFIT intervention will attenuate the loss of lean and muscle mass. We also anticipate an increased fat mass reduction, including ectopic fat depots. Moreover, we believe that the combined intervention will exert additional benefits in the patients' metabolic health as compared to the semaglutide treatment alone.

Conclusion: The SEMAFIT study will provide novel insights on one of the most pressing issues in contemporary obesity medicine, how to improve the body composition of patients treated with highly effective glucagon-like peptide-1 receptor agonists.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.218

Association between dietary fibre intake and body composition and inflammatory markers in healthy adults without obesity: A cross-sectional analysis

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Introduction: Inflammation is associated with age-related diseases. Increased fibre intake is a dietary strategy to reduce inflammation. In North America and Europe, it is recommended that adults consume between 25-30 g of fibre daily[1]. However, it is unclear if fibre intake is associated with improvements in inflammatory markers and body composition in individuals without obesity. This analysis explores the correlation between total dietary fibre intake and body composition and systemic inflammation markers in healthy adults without obesity.

Methods: 220 participants without obesity (69.5% female) with an average age of 37 (SD=7) years and average BMI of 25.1 (SD=1.8) kg/m² were recruited as part of the Comprehensive Assessment of Long-term Effects of Reducing Intake of Energy 2 (CALERIE 2™) intervention. An exploratory analysis of dietary fibre intake (grams), body mass and composition (weight, fat mass, fat-free mass) and inflammatory markers (CRP, ICAM-1, IL-6, IL-8, leptin, MCP-1, TNF-α, insulin, adiponectin) was conducted at baseline. Spearman's rank correlation coefficient analyses were performed to examine correlations between total fibre intake and body composition and inflammatory markers. A p-value <0.05 was considered significant.

Results: A mean total dietary fibre intake of 20.1g (SD=7.6) was recorded. Total dietary fibre intake was negatively correlated with CRP (rho=-0.16, p= 0.018), leptin (rho=-0.34, p<0.001) and insulin (rho=-0.34, p<0.001) concentrations. Correlations of total dietary fibre intake with TNF-α, ICAM-1, IL-6, IL-8, MCP-1, and adiponectin concentrations were non-significant (p≥0.059). Fat mass was negatively correlated with total dietary fibre intake (rho=-0.19, p=0.004) and fat-free mass was positively correlated with total dietary fibre intake (rho=0.26, p<0.001). Weight was also associated with total dietary fibre intake (rho=0.13, p=0.048).

Conclusion: This analysis suggests a potential beneficial effect of dietary fibre on body composition and some markers of systemic inflammation in individuals without obesity. Further research should explore the longitudinal relationship between fibre intake and body composition and inflammatory markers during caloric restriction.

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PO4.219

A Systematic Review of Economic Evaluations of Semaglutide and Tirzepatide for Obesity in Adults

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Objective: This systematic review aimed to assess the cost-effectiveness of semaglutide and tirzepatide for managing obesity in adults, providing both direct and indirect pharmacoeconomic comparisons of these treatments.

Methods: A systematic literature review was conducted following PRISMA guidelines. Eligible studies were written in English and included cost-effectiveness analyses (CEAs) and cost-utility analyses (CUAs) on semaglutide (2.4 mg once weekly s.c.) and/or tirzepatide for obesity treatment. Comparisons against each other, as well as against no treatment or diet and exercise alone, were considered for inclusion. A comprehensive search [(obesity) AND (semaglutide OR tirzepatide) AND (econom* OR economic evaluation)] was performed in PubMed/Medline on January 10, 2025. Additionally, references were hand-searched. Data extraction was performed manually.

Results: After screening, 10 CEAs were included for further analysis. Markov model was identified as the predominant modelling approach, whilst healthcare sector was the most commonly applied perspective. Economic outcomes of the included studies varied widely. All studies compared semaglutide with diet and exercise/lifestyle modification but one, which provided an indirect comparison between semaglutide and tirzepatide. Gómez Lumbreras et al. provided an indirect comparison (with phentermine plus topiramate-PpT as a comparator) from the US

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payer's perspective; the ICERs for semaglutide versus PpT and tirzepatide versus PpT were $24,274,467/QALY and $355,616/QALY, respectively.
Conclusion: Due to the absence of both direct and indirect pharmacoeconomic evaluations comparing semaglutide and tirzepatide, no definitive conclusions on their comparative cost-effectiveness can be drawn, although from indirect comparison it seems that tirzepatide may be more cost-effective than semaglutide. Future research should aim to address uncertainties in economic evaluations and consider incorporating additional factors such as MACE benefits, renal benefits, and obesity-related complications into ICER calculations.

PO4.220

A blended personalized lifestyle intervention to prevent type 2 diabetes development in people with prediabetes

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Introduction: It is known that people living with overweight or obesity may have prediabetes, that will develop into diabetes when no changes in lifestyle are made. Combined Lifestyle Interventions are available as treatment for people living with obesity or overweight and at risk for cardiometabolic disease. However, most people living with overweight do not know if they are at risk by having prediabetes since this often goes without symptoms. An intervention to increase awareness of diabetes risk and test the feasibility of a lifestyle program was therefore executed, to examine whether prevention of further diabetes development is possible with a blended combined lifestyle intervention.
Methods: A general practitioner invited potential participants of his practice, based on known increased BMI. After information and consent, eligibility of participants was assessed by point-of-care testing of HbA1c as a marker of prediabetes (HbA1c between 39-53 mmol/mol). Participants started a three-month blended lifestyle intervention with face-to-face meetings with a dietitian, two group sessions and digital support using the Vivica Health app. The app contains lifestyle information and a chat to support shared decision-making. At the start, after one month and at the end of the intervention, anthropometry, body composition (InBody), dietary intake (questionnaire), and point-of-care testing of HbA1c and blood lipids (Cobas b101, Roche Diagnostics) were performed.
Results: Of the nine participants, two dropped out due to digital illiteracy. On average, body weight reduced with 4.2±1.3 kg (mean ± SEM) ($p<0.05$). HbA1c and blood lipids did not change after three months of intervention. Body composition improved by reduction of body fat percentage of 3.2±0.8 % and visceral fat 24.6±7.1, both $p<0.05$. People with a lower BMI also showed a lower HbA1c ($r=0.19$; $p<0.05$). Fat free mass was maintained. Most participants actively followed the online program in the Vivica app, but the 1 on 1 sessions with the dietitian and the group sessions were most appreciated (a score of 8.7 out of 10). The dietitian's advices were rated as reliable, useful and innovative, and affecting habitual food intake at three months.
Conclusion: The small feasibility study showed benefits with respect to body weight and body composition. However, no effects on HbA1c and related diabetes risk were present, maybe due to the small number of participants and duration of the study. A relation between BMI and HbA1c was found at three months. Roll-out of the program to more patients living with prediabetes and a higher number of health care professionals is needed to investigate possible benefits for diabetes prevention of this appreciated blended lifestyle intervention.

PO4.221

Evaluation of the Effectiveness of weight management programmes in Medical Weight Management clinic: Insights from a Single Centre in Northeast UK

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Introduction: Obesity is a chronic and progressive condition associated with significant morbidity and mortality worldwide. Effective weight reduction strategies, including lifestyle interventions, pharmacotherapy, and bariatric surgery, can alleviate obesity-related comorbidities. However, the current UK shortage of GLP-1 receptor agonists (GLP-1RAs) due to limited NHS funding has emphasized the role of lifestyle modification in obesity care. This study evaluated the effectiveness of a lifestyle modification programme at Medical Wright Management Clinic at the University Hospital of North Durham.
Methods: A retrospective analysis was conducted on 86 patients who attended the clinic between January and October 2024, with 55 meeting the inclusion criteria of attending at least two follow-up appointments over six months. Data collected included demographic characteristics, obesity-related comorbidities, baseline and follow-up weight, BMI, dietary and exercise plans, psychological support, and use of weight-loss medications. The primary outcome was the percentage of patients achieving weight loss, specifically those who met or exceeded a 5% reduction in body weight. Secondary outcomes included mean percentage weight loss, programme adherence, and factors influencing weight-loss success.
Results: Among the 55 patients analyzed (mean age: 46.9 ± 13.9 years; mean BMI: 49.6 ± 9.2 kg/m^2; 70.1% female), 80% had Class 3 obesity, and 85.4% presented with obesity-related comorbidities. All patients received personalised dietary plans, with the majority advised to consume 2,000–2,800 kcal/day. After six months, the average weight loss was 4.3 ± 0.6 kg, representing a 3% reduction in body weight. Notably, 67% of patients experienced weight loss, with 49% achieving the ≥5% weight loss target which is recommended for bariatric surgery eligibility. Patients using GLP-1 RA/Tirzepatide achieved superior outcomes, with an average weight loss of 6.7 kg (5.2%), compared to 3.7 kg (2.5%) among those undergoing lifestyle modification alone.
Barriers to successful weight loss included the absence of exercise plans, limited cognitive behavioral therapy (CBT) participation, higher caloric intake, and suboptimal adherence to dietary goals. Psychological support was underutilised, with only 14.5% of patients completing CBT sessions. Variability in weight-loss medication regimens, combined with a lack of standardisation, further highlighted gaps in care. Additionally, 66.7% of patients awaiting bariatric surgery failed to achieve preoperative weight-loss targets.
Conclusion: This study findings highlight the need to enhance the programme to meet NICE UK guidelines for obesity management. Key recommendations include maintaining a daily calorie deficit of 600 kcal and offering low calorie dietary plans (800–1,600 kcal/day), using food diaries for adherence, tailoring exercise plans for mobility limits, expanding CBT access, and standardizing medication protocols once shortages are resolved and funding improves.

PO4.222

Prevalence of sarcopenic obesity using the ESPEN/EASO criteria in outpatients with obesity

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Introduction: Co-existence of excess adiposity and low muscle mass/function is referred to sarcopenic obesity (SO), a condition increasingly recognized for its clinical and functional features that negatively affect clinical outcome.

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This study aimed to investigate the prevalence of sarcopenic obesity, as defined by the European Society for Clinical Nutrition and Metabolism (ESPEN) and European Association for the Study of Obesity (EASO) consensus statement, in adult female and male outpatients with obesity (BMI≥30 kg/m²).

Methods: Nine hundred and eighty nine outpatients (age range 18-70 y, 314 male and 675 females) participated into the study (M: age 39.0±14.7 yrs, weight 122±25 kg, height 174±7 cm, BMI 40.4±7.9 kg/m²; F: age 41.0±14.6 yrs, weight 100±19 kg, height 161±6 cm, BMI 38.5±6.9 kg/m²) Medium Hand Grip Strength (HGSm) for the right and left arms was measured with a handgrip dynamometer and body composition was estimated by bioimpedance analysis (BIA); fat free mass (FFM) and fat mass (FM) were calculated using the Sun equation and appendicular skeletal muscle mass (ASM) was calculated using by Janssen equation.

Sarcopenic obesity was determined using the ESPEN and EASO criteria (for females: FM≥ 43% and ASM ≤27.6% and HG≤16 kg, for males: FM≥ 31% and ASM ≤37% and HG≤27 kg).

Results: in males, mean FFM was 79.6±11.9 kg, FM% 34.2±6.5%, HGS was 35.3±9.1 kg, ASM was 30.6±4.8 % and Phase Angle (PA) was 6.55±0.92 degree.

In females, mean FFM was 53.7±7.3 kg, FM% 45.4±5.0%, HGS was 20.5±4.9 kg, ASM was 24.5±3.4 % and PA was 6.00±0.78 degree.

In summary, FM≥ 43% was found in 460 (68%) women, ASM ≤27.6% was found in 555 (82.2%) and HG≤16 kg was found in 122 (18.1%) patients; regarding males, FM≥ 31% was found in 212 (67.5%) patients; ASM ≤27% was found in 289 (92 %) patients and HG≤27 kg was found in 52 (16.6%) patients.

We found that the prevalence rate of sarcopenic obesity in all outpatients was 12.3% (122 patients, M 41,F 81).

The significant differences between sarcopenic group (n.122) and non sarcopenic group (n. 867) regards age (43.3±16.7 yrs vs 39.7±14.2 yrs, p=0.011), height (162±9 vs 165±9 cm, p=0,0001), BMI (41.5±7.0 vs 38.7±7.2 kg/m², p= 0,00009), FM% (44.6±5.8% VS 41.4±7.7%, p= 0,00001) and PA (5.89±0.83 vs 6.22±0.85 degree, p=0,0007)

Conclusion: Our findings show that the prevalence of sarcopenic obesity is strongly associated with fat mass% and phase angle and is not related to aging. Further studies are needed to determine whether SO is associated with other clinical and metabolic impairments.

PO4.223

Mapping the evidence: a scoping review on consumer wearable validity and BMI

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Background: People with obesity (body mass index (BMI) ≥30 kg/m2) are at a high risk of developing cardiovascular and respiratory diseases. Monitoring cardiovascular and respiratory outcomes such as heart rate, heart rate variability, blood pressure, respiratory rate and blood oxygen saturation (SpO2) could aid in the early detection and management of disease in this population. Consumer wearables provide opportunities for monitoring these outcomes unobtrusively. Before implementing consumer wearables, however, it is important to consider whether their physiological measurements are valid in people with obesity. Evidence suggests that BMI could influence measurement. However, as only few previous reviews on wearable validity have reported BMI, the representation of people with obesity in these studies is currently unknown. This scoping review therefore aims to evaluate the representation of BMI and other user characteristics in wearable validation studies as well as to summarize the current evidence on the influence of BMI on wearable measurement validity.

Methods: A literature search was conducted in Scopus, PubMed and IEEE Xplore databases in June 2024. Publications were eligible if they assessed the validity of consumer wearables for heart rate, heart rate variability, blood pressure, respiration rate or SpO2 compared to a reference method. After duplicate removal, 551 publications where screened for eligibility. A total of 164 articles were included. In all eligible articles reporting BMI, the percentage of people in each BMI category was estimated based on reported mean and standard deviation. Additionally, the results from the publications investigating the influence of BMI on validity were compiled.

Results: Of the 164 included publications, 87 reported BMI. The pooled mean ± SD of BMI in these studies was 25 ± 4.4 kg/m2 and the median [IQR] estimated percentage of people with obesity was 6% [0%, 18%]. The median [IQR] estimated percentage of people with overweight and normal weight were 31% [21%, 36%] and 49% [35%, 65%], respectively. Eight studies investigated the influence of BMI on heart rate measurement validity of which two reported a significant effect. One study reported a lower validity in people with obesity compared to those without. However, another reported an negative association between BMI and measurement error. For SpO2, two studies investigated the influence of BMI on validity, but found no significant effect. No studies on heart rate variability, blood pressure or respiratory rate investigated the effect of BMI.

Conclusion: So far, the number of studies investigating the influence of BMI on the validity of consumer wearables as well as the representation of people with obesity is limited. This suggests that more research on the validity of consumer wearables in this population is required. Future wearable validation studies should improve on the current studies by using more than a single validity outcome measure in the analysis, by using larger sample sizes and by increasing the representation of people with obesity.

Conflict of Interest: None to disclose.

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PO4.224

Osteosarcopenic obesity: a call for consensus on definitions and diagnostic criteria

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Introduction: Aging leads to numerous physiological adaptations, including significant changes in body composition (muscle, fat, and bone tissues). The concurrent presence of osteopenia/osteoporosis, sarcopenia and obesity has recently been identified as a clinical condition termed osteosarcopenic obesity (OSO). However, the absence of consensus on diagnostic criteria and standardized cut-off values makes prevalence estimates of OSO challenging and limits its utility as a predictor of various health outcomes. This systematic review aimed to examine current definitions and diagnostic criteria for OSO in human studies.

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Methods: A systematic literature search was conducted across PubMed, Scopus and Web of Science from inception until July 31st, 2024. Human studies including individuals of both sexes, all ages, and ethnicities were included. Articles lacking well-specified definitions or cut-offs for osteopenia/osteoporosis, sarcopenia and obesity were excluded. The PRISMA 2020 guidelines were followed, and the methodological quality was assessed using the National Institutes of Health Quality Assessment Tools. **Results:** The search identified 64 potentially relevant studies after duplicate removal and initial screening of titles and abstracts. Of these, 39 studies collectively involving 118,791 participants, met the inclusion criteria. Marked clinical heterogeneity was observed in terms of diagnostic criteria, which was largely attributable to the variability in parameters and procedures for assessing sarcopenia and obesity, methodologies for the assessment of body composition, as well as reference cut-off values. This heterogeneity may be explained by different methodological resources across settings, specialists' and researchers' expertise, and the characteristics of study populations.
Conclusion: These findings highlight significant gaps in current research on OSO, particularly regarding the lack of consistent definitions, diagnostic criteria, and methodologies. These results underscore the need for consensus proposals to establish 1) a standardized definition of OSO, 2) diagnostic criteria with practical and clinically relevant cut-offs, and 3) consistent methodologies for assessment. Addressing these gaps will enhance the identification of OSO prevalence, clarify its clinical and functional implications, and support the development of effective prevention and treatment strategies.

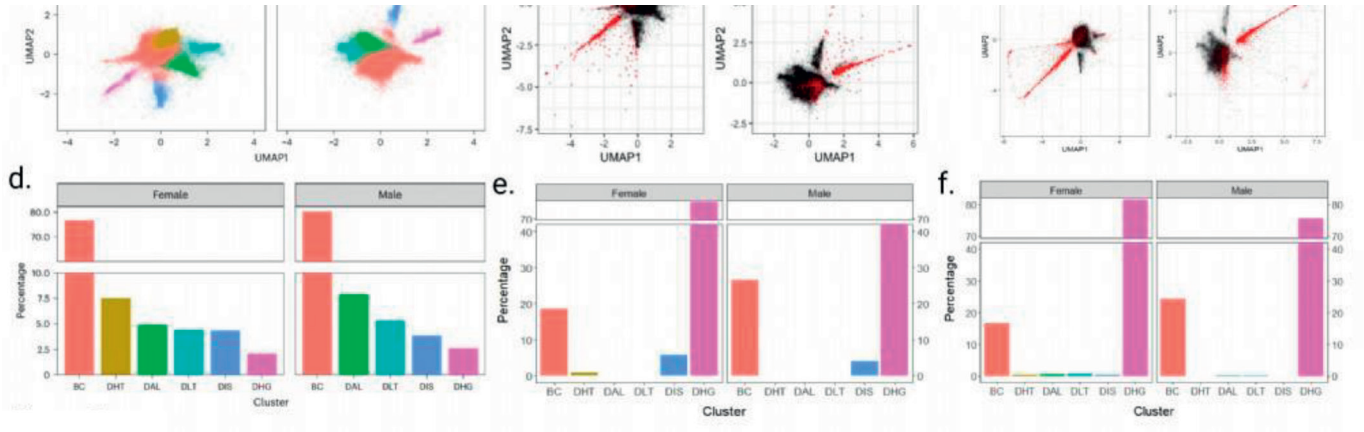
PO4.225

Subclassification of obesity for precision risk prediction in type 1 diabetes: An IMI2 SOPHIA analysis

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Introduction: Recently, 5 distinct phenotypic risk profiles for cardiovascular (CV) disease and type 2 diabetes were identified in the general population in Europe with diverse relationship between body mass index (BMI) and cardiometabolic biomarking.1 We aim to explore if the same risk profiles are present in an adult population with type 1 diabetes (T1D).
Methods: Adults living with T1D followed-up between 2010 to 2022 in the University Hospital (UZ) Leuven in Belgium and the German/Austrian/Luxembourgian/Swiss diabetes prospective follow-up registry



Uniform Manifold Approximation and Projection for Dimension Reduction (UMAP) 2D projections: a. General population, colors denote profile allocations: baseline concordant -BC-, discordant hypertensive -DHT-, discordant adverse lipid profile -DAL-, discordant liver transaminase -DLT-, discordant inflammatory -DIS- and discordant hyperglycemic -DHG- (adapted from Coral, D. et al1) and population with T1D from b. UZ Leuven and c. DPV depicted in red and plotted over original profiles in black. d. Percentage of population per cluster in the general population (adapted from Coral, D. et al1) and in the population with T1D from e. UZ Leuven and f. DPV for females and males respectively.

Fig. 1.

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DPV were included in this analysis. Biomarkers associated with CV risk: fasting glucose, lipids (HDL, LDL, triglycerides), blood pressure, serum creatinine, ALT, CRP and waist/hip ratio were used in unsupervised clustering. Age-, smoking status- and disease duration- adjusted associations in all biomarkers per unit increase in BMI were estimated by taking the residuals of a linear model before clustering. To validate the previously identified subgroups1, cross-sectionally, the visit with the most amount of information available for all biomarkers was used. Missingness was imputed using nearest neighbor. An overview of the analysis pipeline has been previously published.1

Results: UZ Leuven had a population of 1663 (51% female/49% male) and DPV had 9490 persons (53% female/47% male) used in this analysis. Three risk profiles were mostly represented in the population with T1D: concordant, hyperglycemic and inflammatory (Figure 1b, c, e and f). The majority (~70%) belonging to the discordant hyperglycemic profile (Figure 1e. and 1f.) while this cluster is the smallest (~2.5%) in the general population (Figure 1d.). Furthermore, in the population with T1D, mean HbA1c% was numerically lower in the concordant cluster (6.9±0.9/7.1±1.0 in UZ Leuven and 7.1±1.6/7.3±1.5 in DPV for females/males respectively) than in the hyperglycemic (7.8±1.0/7.8±1.3 in UZ Leuven and 7.9±1.5/8.0±1.5 in DPV for females/males respectively) and inflammatory (7.4±1.1/7.7±1.0 in UZ Leuven for females/males respectively) profiles.

Conclusion: While these risk profiles appear well-suited for the general population, not all of the previously identified five risk profiles are greatly present in a population with T1D. Nevertheless, better glycemic control appears to correspond to a lower-risk profile, such as the baseline concordant cluster, aligning more closely with the general population. This observation underscores the critical role of achieving optimal glycemic control in people living with T1D.

Reference

[1] Coral DE, Smit F, et al. Subclassification of obesity for precision prediction of cardiometabolic diseases. Nat Med. 2024 Oct 24. doi: 10.1038/s41591-024-03299-7.Epub ahead of print. Erratum in: Nat Med. 2024 Nov 21. doi: 10.1038/s41591-024-03403-x. PMID: 39448862.

PO4.226

A systematic review of the effects of glp-1 receptor agonist treatment in post-bariatric surgery patients

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Introduction: Bariatric surgery (BS) is a treatment for severe obesity, encouraging rapid weight loss. However, there is a risk of weight regain or insufficient weight loss in some patients, often necessitating further surgery. The advent of GLP-1 receptor agonists (GLP-1 RA) has revolutionised obesity treatment and its use as a weight loss adjuvant in patients who have undergone BS has the potential to significantly enhance clinical outcomes. This systematic review aims to investigate the effectiveness of using GLP-1 RA alongside BS in promoting and maintaining weight loss.

Method: A systematic literature search was undertaken using PubMed and Google Scholar. Search terms included "GLP-1 agonist", "semaglutide", "Liraglutide", "Weight loss" and "Bariatric surgery". Inclusion criteria included articles published after 2013, in English language and in peer reviewed journals. A total of 19 articles were selected for inclusion.

Results: The GLP-1 RA focused on in this review are semaglutide, liraglutide and tirzepatide each titred to different dosages. These were used on patients who had experienced insufficient weight loss or weight regain post BS. The patients used in the studies had either a Roux en Y gastric bypass, laparoscopic adjustable gastric banding, or laparoscopic sleeve gastrectomy. Fourteen of the studies tested the effects of liraglutide post BS, eight of the studies tested semaglutide post BS and two of the studies included other GLP-1 RA in their analysis. Patients were followed up at different intervals varying from 3 – 24 months to assess weight loss. All the studies found the medication to have significant effect on weight loss with majority of patients experiencing >5% total body weight loss (TWL) or reduction in BMI within 6 months of initiation of the medication. Control patients not initiated on treatment were found to remain weight stable or lost significantly less weight than those in the treatment arms. There was no significant difference found when comparing the types of BS previously had on the weight loss after initiation of medication with nor was there a significant difference between male and female outcomes. The data demonstrated a general trend where the longer the drug was used after BS the higher TWL as well as being more effective at higher doses.

Conclusion: There is significant improvement in encouraging TWL and preventing regain in BS patients when GLP-1 RA are used alongside it in the management in comparison to use of BS alone with minimal adverse effects. The efficacy of the GLP-1 depends on duration of administration and the specific drug used however there is no significant difference in weight loss when considering the type of BS suggesting no influence on the ultimate weightloss. Further research is needed into this topic to improve management plans for patients with obesity so that they may avoid revision procedures in the future and longer studies should be conducted to ensure that GLP-1s allow for sustained weight loss. There is also a need for further studies conducted on Tirzepatide as there is limited research on the drug despite the research showing it as the most effective GLP-1RA.

PO4.227

Apnea-Hypopnea Index in patients with or without preventive oxygen therapy after bariatric surgery, a randomized non-inferiority trial

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Introduction: There is limited evidence on the optimal postoperative strategy for obstructive sleep apnea (OSA) in patients undergoing metabolic and bariatric surgery (MBS), while the prevalence of OSA in this population is up to 70%. Monitoring with pulsoximetry and preventive oxygen therapy during the first postoperative night is proven to be safe and cost-effective. However, it is unclear if preventive oxygen within this context has added value. The primary objective of this study was to compare Apnea-Hypopnea Index (AHI) in patients with potentially undiagnosed OSA, treated with or without preventive oxygen, during the first night after bariatric surgery.

Methods: This is a randomized controlled non-inferiority trial consisting of two arms; Arm a: first postoperative night in the hospital with preventive oxygen therapy 2L/ min (standard care), Arm b: first postoperative night in hospital without preventive oxygen therapy (intervention). Inclusion criteria were patients undergoing primary MBS, exclusion criteria were OSA with treatment, same-day discharge MBS, having a pacemaker, being a professional driver and the use of alpha blockers. Patients in both arms were continuously monitored by pulsoximetry and underwent a sleep test with the WatchPAT300. The non-inferiority limit was set to a difference in AHI of 11, which gave a required sample size of 126 patients. Inclusion has been completed and an analysis of the full data set is expected in March 2025.

Results: Preliminary data of 89 patients (71% of intended sample size) was analyzed, 46 patients were randomized in the group with and 43 patients in the group without preventive oxygen therapy. The median SpO2 was 95% [IQR 96-97%] in patients with and 92% [IQR 91-94%] in those without oxygen. Percentage of sleep time with a SpO2 <90% was 0% [IQR 0-0%] in patients with and 0.2% [IQR 0-4%] in patients without oxygen. Median AHI was 2.0 [IQR 0.9-3.5] in patients with and 5.7 [2.2-22.5] in

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patients without oxygen. Mean difference in AHI was 3.3 (95% CI 2.0-5.4), which is below the non-inferiority limit of 11.
Conclusions: Based on these preliminary results, preventive oxygen therapy seems to have limited added value in preventing apneas or low saturation levels in the first night after bariatric surgery.

PO4.228

Effects of incretin-based pharmacotherapies on body composition: a systematic review protocol

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Background: Incretin-based pharmacotherapies (IBPs) are changing the landscape of weight management interventions, demonstrating substantial weight loss and improvements in health conditions. They suppress appetite via central and peripheral mechanisms, overcoming barriers associated with lifestyle interventions and bridge the gap to bariatric surgery, which is accompanied by long waiting lists and lifelong management. Bariatric surgery results in significant reductions in body weight, primarily driven by loss of fat mass, as well as reduced muscle mass. In addition to being essential for physical function, muscle tissue contributes to resting metabolic rate. Yet Initial evidence suggests that IBPs result in greater proportions of muscle tissue loss compared to other weight loss modalities. Excessive muscle loss may lead to detrimental consequences, including sarcopenia and sarcopenic obesity, and if confirmed, whether consequences are equivalent across different IBPs available. Furthermore, studies have not examined the literature on muscle quality, a key indicator of sarcopenia and sarcopenic obesity. Therefore, this systematic review aimed to synthesise and compare the effects across IBPs in adults with obesity on body composition, including muscle mass, fat mass and muscle quality.
Methods: This registered study (PROSPERO: CRD42024620555) was conducting following the Cochrane Handbook for Systematic Reviews and will be reported following the PRISMA guidelines. Inclusion and exclusion criteria were based on the PICOS framework (Table 1). Medline, Embase, Scopus and Cochrane Central Register of Controlled Trials (CENTRAL) electronic databases were searched from inception. Retrieved title and abstracts will be screened against inclusion/exclusion criteria by one reviewer (RMI). Full text articles will then be reviewed and data extracted by two independent reviewers (RMI and MM). Data will include study, participant and intervention characteristics. Outcomes of interest include validated measures of body composition including muscle mass, muscle quality and fat mass. The RoB2 tool will be used to assess risk of bias. Data will be analysed qualitatively using narrative synthesis and quantitatively using meta-analyses unless prohibited by heterogeneity and/or lack of data.
Results: Searches of Medline, Embase, Scopus and CENTRAL electronic databases were completed on 11th January 2025. With duplicates removed, the strategy revealed 3275 studies for title and abstract screening.
Discussion: Incretin-based pharmacotherapies have provided hope to many people living with obesity, many of whom have had numerous unsuccessful attempts at weight loss. However, there are concerns about unintended consequences of significant proportions of muscle mass loss, potentially contributing to the development of sarcopenia and sarcopenic obesity. Systematically scrutinising the available literature and determining the comparative effects different IBPs have on body composition will affect knowledge mobilisation towards the optimisation of strategies to support healthy weight loss.

Tab. 1. Study inclusion and exclusion criteria using the PICO framework.

Criteria	Inclusion	Exclusion
Population	Aged >18yrs Living with obesity (BMI > 30 kg/m2 white ethnicity) or BMI > 27.5 kg/m2 with at least one related co-morbidities (HTN, dyslipidaemia, OSA, CVD)	Non-human studies Contra-indicated to use incretin-based pharmacotherapies
Intervention	Incretin based pharmacotherapy to treat obesity	Concurrent weight loss treatments
Comparator	Usual care, placebo or no intervention	Studies without a control/comparator
Outcome	Primary outcomes of body composition: • Muscle quantity determined via valid measurements such as DXA, BIA, CT and/or MRI, expressed as absolute, % or ratios at baseline and one other time point • Muscle quality determined via validated measurement techniques (i.e. hand grip strength, chair stand tests and CT/MRI), including muscle strength, physical performance and myosteatosis expressed as absolute, % or ratios from baseline and at least one other time point. • Fat mass (total fat mass, visceral adipose tissue (VAT)) measured using valid techniques such as DXA, BIA, CT and/or MRI, expressed as absolute, % or ratios from baseline and at least one other time point. Secondary Outcomes: • Anthropometric measurements including body weight (kg), BMI (kg/m2), waist circumference (cm), waist-to-height ratio, expressed as absolute change, % change and/or ratios • Behavioural changes (e.g. physical activity levels using validated tools) • Adverse events	Studies with unclear/invalid methods of measurements for primary and secondary outcomes
Study Design	Published RCTs and subgroup/secondary analysis of RCTs	Observational (cohort, case-control, cross-sectional), and non-experimental study designs (quasi-experimental studies) Articles not reporting original date (e.g. narrative reviews, systematic reviews and meta-analyses)
Abbreviations	BMI- body mass index; BIA- bioelectrical impedance analysis; CT- computed tomography; CVD- cardiovascular disease; DXA- dual-energy X-ray absorptiometry; HTN- hypertension; Kg- kilograms; M- meters; MRI- magnetic resonance imaging; OSA- obstructive sleep apnoea; RCTs- randomised controlled trials.	

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PO4.229

Dietitians' perspectives on key components relevant for successful dietetic treatment of adults with obesity in primary health care: a qualitative study in the Netherlands

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Background: Dietetic treatment of adults with obesity can result in effective weight loss with health improvements. However, it remains unclear which components of dietetic consultation are key for successful treatment of individual patients. Therefore, the aim of this study is to explore dietitians' perceptions of key components relevant for successful dietetic treatment of adults with obesity in primary health care in the Netherlands.
Methods: In this phenomenological study, semistructured interviews were conducted with 18 dietitians who have experience in treating adults with obesity in primary care. Validation of interview data was performed through two focus group discussions with 14 dietitians. Thematic analysis was used to analyse the data.
Results: Four main themes were identified: (i) building a good relationship; (ii) identifying patient needs; (iii) supporting behaviour change and (iv) providing advice. Dietitians highlighted the relevance of building a good relationship with their patients and emphasised adopting a counselling role alongside their role of educator. They also recommended the use of educational materials, counselling techniques and behaviour change strategies (e.g. goal setting, self-monitoring, addressing barriers) to address specific patient needs, such as health literacy, self-efficacy and motivation.
Conclusions: This study demonstrates that dietitians perceive the ability to build a trusted relationship, in which patient needs are properly explored and addressed, as the key to successful dietetic treatment of adults with obesity. Our findings emphasise the importance of the dietitian's approach in this process and show that patient factors influence the choice of appropriate treatment approaches.

PO4.230

Remission of type 2 diabetes in persons with 3rd degree of obesity after 5 years therapy with semaglutide or dulaglutide

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Introduction: The aim of this study was to analyse the long term treatment effectiveness of GLP-1 analogues semaglutide and dulaglutide in persons with type2 diabetes and obesity. Included were persons with full reimbursement of the therapy by insurance: BMI over 35 and HbA1c over 60 mmol/mol.
Methods: In retrospective analysis we have analysed data from 40 obese type 2 diabetic patients treated with once weekly semaglutide 1mg (22 patients BMI 39.6kg/m2) or dulaglutide 1.5 mg (18 patients BMI 37,4 kg/m2) once weekly for 3 years. In this study following treatment in the 4th and5th year was analysed. In 8 patients it was necessary to add insulin (3 on semaglutide and 5 on dulaglutide) due to elevation of Hb A1c over 60mmol/mol. After 5 years the final evaluation of Hb1c and weight was performed in 32 patients.
Results: The decrease of weight was 8.4 kg and Hb A1c 18.8 mmol/mol from begin of the first year to the fifth year Remission of HbA1c in the fifth year bellow diabetic range- 48 mmol/mol was present in 63% and below prediabetic range - 38 mmol/mol in 25% persons. There was not any significant difference between semaglutide and dulaglutide in chi square analysis of 2x2 contingency table. The Pearson correlation of weight and HbA1c change 0-5 year was significant in both drug: 0.41 for semaglutide and 0.39 for dulaglutide (no significant difference using using Fisher R-to-Z transformation).
Conclusion: The majority of persons with obesity and initially decompensated diabetes are able stay a free of diabetes and a quarter free of prediabetes after 5 year treatment with semaglutide or dulaglutide. The decrease of weight correlates well with the decrease of Hb1c in both drugs.

PO4.231

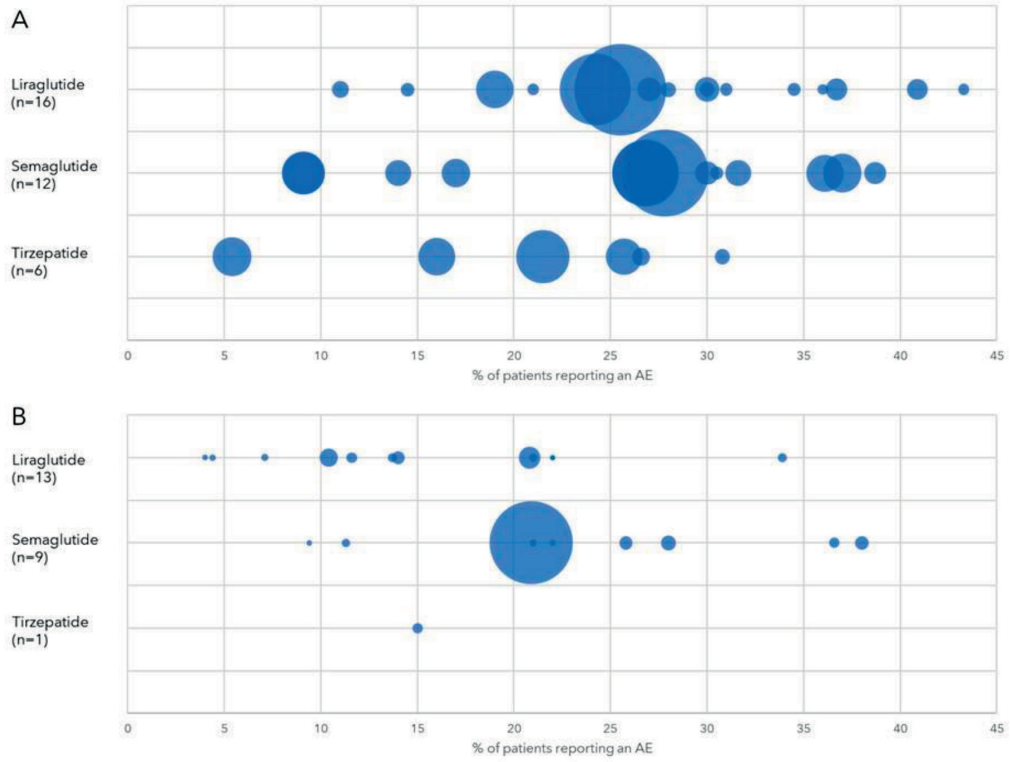
Symptomatic adverse events and patient-reported outcomes related to incretin-based medicines for obesity: a systematic review involving >400,000 subjects

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Background: Newer generation anti-obesity incretin-based therapies (IBTs) (liraglutide, semaglutide, and tirzepatide) have become increasingly popular for their greater efficacy vs older medications. IBTs are commonly associated with adverse events (AEs), which may impair tolerability and treatment adherence. In clinical practice, the beneficial effects of IBTs must be considered in the context of their risk-benefit profile. The aim of this systematic literature review is to provide an overview of the evidence on the symptomatic AEs and patient-reported outcomes of IBTs to facilitate clinical decision making.
Methods: A systematic search assessing IBTs for weight management was conducted via the Ovid platform on 4th June 2024 using a predefined search strategy in the Embase (1980-present), MEDLINE (1946-present), The Cochrane Library, and EconLit (1961-present) databases, to identify controlled trials and real-world evidence (RWE) studies. Studies on liraglutide, semaglutide, or tirzepatide, used for weight management, and with >50 participants, were included. Cochrane review methodology was followed.
Results: Of the 4,414 publications identified, 81 publications involving a total of >400,000 participants were included. Mean patient age ranged from 31–73 years (<50 years in 60 of 81 publications); BMI was ≥30 kg/m² in 71 publications and ≥35 kg/m² in 51 publications; 66 publications enrolled more female than male patients. Liraglutide (n=49), semaglutide (n=34), and tirzepatide (n=7) were used in 47 controlled clinical studies and 33 RWE studies. Gastrointestinal (GI) AEs were most common: nausea (20–50%), diarrhea (20–40%), constipation (20–40%), and vomiting (10–30%). Differential incidences (adjusted for placebo) for nausea are shown in Fig.1. Abdominal pain was reported by 5–10% of patients. The incidence of GI AEs was lower in RWE studies than in clinical trials. Generally, most of the AEs were mild or moderate, and occurred during the dose escalation period. Serious/severe GI AEs ranged from 0–5.6%, leading to discontinuation rates of 0–3% (both excluding outliers). Other clinically relevant AEs included hair loss (4.9–7%) and fatigue (0–15.6%). Health-related quality of life outcomes were reported in 27 publications (mostly assessed by IWQoL, SF-36, or EuroQoL-5) and generally showed that the overall and physical function domains were improved by IBT.
Conclusions: This systematic review of the literature confirms that GI AEs are the most commonly reported symptomatic AEs, and that their incidence varies between IBTs and studies. Clinicians should keep the AE profile of IBTs in mind when making therapy decisions and consider mitigation strategies including nutritional solutions.

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Abbreviations: AE, adverse event; IBT, incretin-based therapy; N, number of patients; n, number of publications; RWE, real-world evidence. †Placebo-adjusted incidence was calculated by subtracting the percentage of patients with an AE in placebo/comparator arm from the intervention arm. The size of each bubble represents the combined number of patients in the treatment and comparator arms (n the largest bubbles, N=3,731 in clinical publications and N=11,326 in RWE publications). Treatment arms for the maintenance dose (or highest dose where maintenance was not used) were selected (e.g. liraglutide 3 mg, semaglutide 2.4 mg, and tirzepatide 15 mg), where a study had more than one treatment arm for the same IBT. If applicable, slow/regular dose escalation group data were selected. If multiple timepoints were available, that closest to 52 weeks was selected. Pooled analyses were selected where available. If multiple studies were recorded in a single publication, these were included separately (where no duplication of data occurred).

Fig. 1. Nausea AE incidence reported in (A) clinical publications (placebo-adjusted†) and (B) RWE publications.

PO4.232

Adiposity and Glucose Metabolism: Insights into Insulin Sensitivity and Secretion from OGTT

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Introduction: The variability in susceptibility to type 2 diabetes among individuals with excess weight remains a critical question in metabolic research. Our study investigates whether markers of insulin sensitivity and secretion, derived from oral glucose tolerance tests (OGTT), are influenced by adiposity-related parameters, providing new insights into the metabolic heterogeneity of overweight and obesity.
Methods: We examined 66 individuals (55% female), with median (IQR) age of 48 years (29, 56). Using a modified OGTT, glucose, insulin, and C-peptide were measured at 30-minute intervals over 3 hours. Insulin sensitivity and secretion were estimated through a model-based approach, while anthropometric and biochemical markers, including visceral adiposity and fatty liver index, were assessed.
Results: Sample had a median (IQR) BMI of 26.2 (23.4, 29.8) kg/m^2. After adjusting multivariate linear regression models for confounders (sex, age, BMI), insulin sensitivity (OGIS Index) was negatively associated with visceral adiposity (-1.2; 95% CI -2.3, -0.1), fatty liver index (-1.4; 95% CI -2.1, -0.6), and triglycerides (-0.4; 95% CI -0.7, -0.1) ($p<0.05$). Fasting HOMA-IR displayed instead a limited association, linked only to visceral adiposity (0.06; 95% CI 0.01, 0.1) and triglycerides (0.02; 95% CI 0.01, 0.04). Additionally, total insulin secretion was positively related to visceral adiposity (0.5; 95% CI 0.1, 0.8), fatty liver index (0.5; 95% CI 0.01, 0.9), and triglycerides (0.2; 95% CI 0.1, 0.3) ($p<0.05$). No statistically significant relationship was found between insulin clearance and adiposity markers; all OGTT-derived parameters were not related to FIB-4 index.
Conclusion: Our findings highlight that OGTT-derived insulin sensitivity (OGIS) is a more robust indicator of metabolic health compared to fasting HOMA-IR. Furthermore, visceral adiposity and fatty liver index strongly correlate with insulin secretion, underscoring their role in the

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pathophysiology of glucose metabolism in individuals with excess adiposity and paving the way for more targeted interventions in obesity-related insulin dysregulation.

PO4.233

Role of estrogen in postmenopausal obesity

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Most women experience overweight and obesity post meopausal period.
In our study we focused on the level and type of estrogen these women suffer and the impact of estrogen on their visceral fat and body fat accumulation 30 post menopausal women were examined for their weight before menopause and their estrogen level as well as their estrogen type and level.
The end result and conclusion that E2 decreased significantely and replaced by E1
We went to the result that E1 increase and E2 decreased could lead to overweight as well as obesity on post menopausal women.

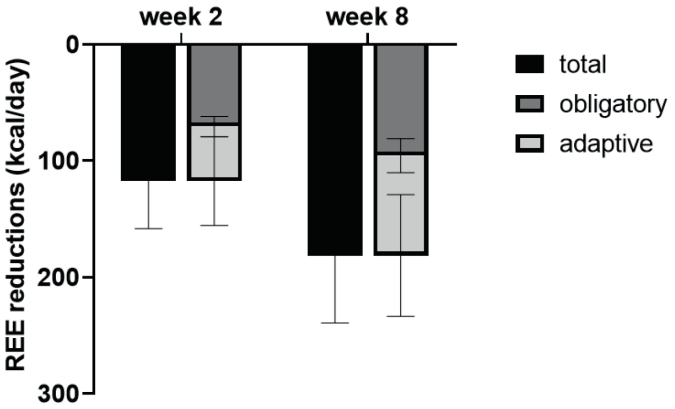
PO4.234

Assessment of dynamic reductions in resting energy expenditure during rapid weight-loss

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Introduction: Voluntary weight loss results in obligatory reductions in resting energy expenditure (REE) following the loss of metabolically active fat-free mass (FFM). This is often accompanied by adaptive reductions in REE designed to restore energy balance whilst in energy deficit, a process referred to as adaptive thermogenesis (AT). Such declines are suggested to be amplified during rapid weight loss resulting in early weight plateau and less-than-expected weight reduction.
Methods: Twenty-two females with overweight or obesity enrolled on commercial total diet replacement programme (TDR) for 8 weeks, providing 600 kcal and 50g protein per day (LighterLife UK Ltd, Essex). Measures of body weight, body composition (fat mass, FFM, total body water) and REE were collected at baseline, week 2 and week 8. Body composition was estimated using both multi-frequency bioelectrical impedance analysis (MF-BIA) and dual-energy X-ray absorptiometry (DXA). REE was measured by indirect calorimetry using a ventilated hood. AT was calculated as the difference between measured REE and that predicted by FFM.
Results: Participants lost 3.80±1.68 kg body weight at week 2 and 8.96±3.81 kg at week 8. FFM decreased by 2.24±1.30 kg and 3.17±2.05 kg at week 2 and 8 respectively, with reductions largely attributed to total body water; 1.25±.1.22 L and 1.86±1.35 L respectively. REE declined by 181±238 kcal/day by week 8, with 48% of this reduction attributed to AT. Notably, 117±183 kcal/day of total REE reductions occurred by week 2, 40% of which was explained by AT. Using MF-BIA, estimates of fat mass were 6–7 kg lower than that measured by DXA, consistently across all timepoints. Subsequently, MF-BIA underestimated FFM loss at week 2 and 8 by 0.5–0.6 kg.
Conclusion: TDR results in clinically significant weight loss within 8 weeks. While FFM reductions are considerable, most occur in the first 2 weeks of the intervention and can be largely attributed to significant fluid losses. A >10% reduction in REE is observed at week 8, yet almost 70% of this reduction occurs in the first 2 weeks of weight loss. Almost half of REE reductions at week 2 are explained by AT, supporting the existence of an immediate AT response. MF-BIA provides systematically lower estimates of FFM loss compared to DXA, giving the illusion of more desirable body composition changes. Thus, MF-BIA estimates in clinical weight management should be interpreted with caution.



Data is presented as mean (SEM). Total REE represents REE measured by indirect calorimetry, obligatory REE represents that predicted by loss of FFM and adaptive REE represents that assumed adaptive thermogenesis (REE-measured – REE-predicted).FFM, fat-free mass; REE, resting energy expenditure.

Fig. 1. Changes in resting energy expenditure at week 2 and week 8.

PO4.235

A feasibility study of the Redesigning Daily Occupations (ReDO®) programme for adults living with obesity attending specialist clinical services in Ireland

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Introduction: NICE guidelines (2023) highlight the importance of non-weight related interventions for adults living with obesity. Recently, clinical specialist occupational therapists were integrated into obesity services in Ireland and have been piloting the ReDO® programme (Erlandsson 2013). ReDO® is a 10-week, manualised, group-based intervention. It explores the relationship between time-use, activities and health through discussions, workshops, reflections and practical activities.
Methods: A mixed-method feasibility study was conducted to pilot the ReDO®-10 programme at two services in Dublin and Galway in Autumn 2024. Adults (aged 18+) living with obesity and attending specialist obesity services were invited to take part on a non-random basis. Quantitative data are collected at baseline, post-intervention and 3-month follow-up by an independent researcher. The outcome measures include a demographic questionnaire, EQ-5D-5L (health-related quality of life), WHODAS 2.0 (health/disability), OVal-pd (occupational value) and MYCaW™ (concerns/wellbeing). Treatment fidelity was monitored through weekly reflections completed by occupational therapists after each session. Follow-up data collection is scheduled for 2025. Qualitative interviews will be conducted with the ReDO® participants, occupational therapists and stakeholder's post-programme.
Results: Ten female participants (mean age 54.90, SD 13.72) completed the 10-week ReDO® programme, indicating high retention. There was an average weekly attendance of 80%+, with non-attendance mainly due to unforeseen circumstances. Nineteen individuals declined participation due to barriers such as geographical distance, transportation, work/family commitments. Pre-post measures suggest improvements across all outcomes. For example, the mean baseline perceived health rating from the EQ-5D-5L VAS was 50.20, which increased to 68.22 post-intervention. Qualitative MYCaW™ findings indicated that participants valued peer-support and found the programme content meaningful. Reflective data from occupational therapists indicated that the intervention aligned with their core professional values and was within the scope of practice.

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They reported satisfaction with group delivery and observed the empowering impact on participants. However, service demands posed challenges for group planning.

Conclusion: This is the first pilot of the ReDO® programme with adults living with obesity in Ireland, led by occupational therapists. The programme is acceptable, feasible to deliver and shows promising improvements in perceived health, quality of life and occupational value. Ongoing data collection will provide additional insights. Future research should consider hybrid delivery to address the wide geographical spread of services.

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PO4.236

Routine practice of apixaban and rivaroxaban in patients undergoing metabolic bariatric surgery with clinical outcomes and anti-Xa peak levels before and after surgery

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Background: Absorption of Direct Oral Anticoagulants (DOACs) may be impaired after metabolic and bariatric surgery (MBS). Therefore, the advice in the Netherlands is to switch to vitamin K antagonist (VKA) after MBS, due to a lack of evidence regarding the efficacity and safety of DOACs. The aim of this study is to evaluate the efficacy and safety of apixaban and rivaroxaban after MBS.

Methods: In this retrospective cohort study, patients using apixaban 5mg bidaily or rivaroxaban 20 mg once-daily with anti-Xa peak level assessment after MBS were included. The primary outcomes were: prevalence of postoperative bleeding and thrombo-embolic events, and anti-Xa peak levels.

Results: Of the 146 included patients, 121 used apixaban and 25 rivaroxaban. Rivaroxaban users switched significantly more to alternative anticoagulants (48.0% versus 2.5%; p=<.001) and more thrombo-embolic events occurred (12% versus 1.7%; p=.003). Bleeding events only occurred in apixaban users (1.7% versus 0.0%; p=1.00), however these were minor or attributable, so patients continued with the use of apixaban. The anti-Xa peak levels were more frequently below the therapeutic range in rivaroxaban users (41.7% versus 0.8%). The median anti-Xa peak level in apixaban users increased during the first month postoperative, after which the levels gradually decreased, but remained well within the therapeutic range. The median anti-Xa peak levels for rivaroxaban were very variable and from 1 year postoperative onwards, all below the therapeutic range. Based on therapeutic ranges, there were no clinical relevant differences in median anti-Xa peak levels between RYGB and SG in both apixaban and rivaroxaban users.

Conclusion: This study indicates that apixaban is a better option than rivaroxaban in patients after MBS. Apixaban appears to be effective and safe with 94.4% of the anti-Xa peak levels being within therapeutic range and low rates of thrombo-embolic and bleeding events. Future research, preferably a clinical trial comparing apixaban and VKA after MBS, must confirm the efficacy and safety of apixaban. Meanwhile, if apixaban is used, it would be advisable to measure the anti-Xa peak level at least once after MBS.

PO4.237

Disconnect between the perceptions of people with obesity and their physicians in real-world settings in Europe, the United States, and Australia

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Introduction: At population level, obesity significantly reduces quality of life (QoL), impacting psychological well-being and reducing life expectancy [1,2]. At the individual level, causes of obesity, its impacts and treatments are heterogeneous and multifaceted [3]. Although classified as a chronic, relapsing disease [4], obesity is often not adequately managed and depriortised in healthcare settings [5]. Understanding of the disease among physicians and people with overweight/obesity (PwO) remains limited, partly due to deep-rooted weight bias and stigma. As a result, PwO lack access to evidenced and person-centred care. We evaluated physician and PwO perceptions of obesity causes and therapeutic goals using the Adelphi Real World Obesity Disease Specific Programme™ (DSP).

Methods: Observational study based on DSP data; a cross-sectional survey with retrospective data captured from October 2023 to April 2024 in France, Germany, Italy, Spain, United Kingdom, United States, and Australia. Physicians provided data for the first 8 consulting PwO meeting selection criteria (previous/at data capture body mass index (BMI) ≥30 kg/m2 or BMI ≥27 kg/m2 with at least one obesity-related complication; obesity management program at data capture; 18+ years). BMI at data capture may not indicate overweight/obesity. PwO completed a voluntary questionnaire including perceptions of obesity aetiology and therapeutic goals. Descriptive analyses were conducted by BMI category and the Edmonton Obesity Staging System (EOSS) classification at data capture; retrospectively imputed from physician-reported variables.

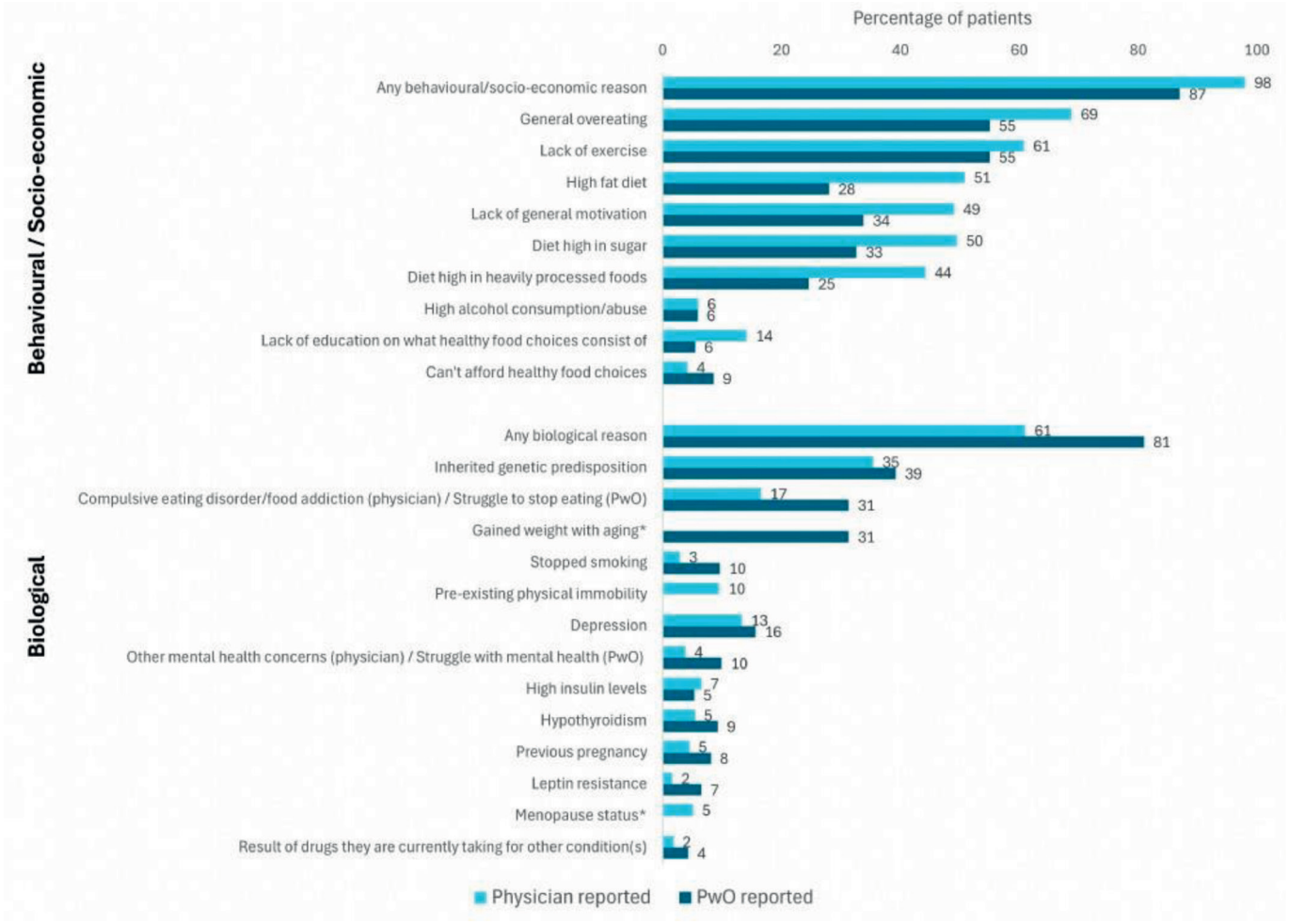
Results: PwO and physician-reported responses for 1379 PwO were analysed. Physicians attributed PwO obesity to behavioral and socio-economic causes more than biological, with overeating (69%) and lack of exercise (61%) most reported, increasing with BMI (Class III: general overeating, 75%; lack of exercise, 66%) and EOSS category (EOSS 3-4: general overeating, 72%; lack of exercise, 67%). Although PwO attributed obesity to behavioural and socio-economic causes (87%), they did so to a lesser extent than physicians (98%), reporting higher levels of biological causes (81%) than physicians (61%). PwO regarded genetics as the leading biological cause of their obesity and physicians ranked genetics 7th on the list of causes. Physicians reported health-focused obesity treatment goals such as improving QoL, regardless of BMI or EOSS status, improving mobility, and lowering blood pressure. PwO motivations were to look/feel better and fit into smaller clothes, regardless of weight loss outcomes.

Conclusions: Physician and PwO perceptions of obesity aetiology and therapeutic outcomes differed. While physicians often cited behavioral and socio-economic factors as primary causes, PwO tended to attribute the condition to biological factors, though recognising lifestyle as a major contributor. Findings highlight biased misconceptions surrounding obesity which may impact availability and access to evidenced and person-centred care.

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Note: 'Menopause' was not a response option for PwO; 'Gained weight with aging' was not a response option for physicians. Abbreviations: PwO, People with overweight/obesity.

Fig. 1. Causes of obesity reported by PwO and their physicians (n=1379).

PO4.238

Evaluation of Food Craving and Biochemical Parameters in Women with Polycystic Ovary Syndrome and Insulin Resistance

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Introduction: PCOS (polycystic ovary syndrome) is a common endocrine disorder affecting 6-20% of women of reproductive age(1). Insulin resistance is an important factor exacerbating the underlying metabolic abnormalities in the pathophysiology of PCOS. It has been reported that high androgen levels in individuals with PCOS may increase appetite (2) this study aimed to evaluate insulin resistance, anthropometric measurements, and food craving levels in individuals with polycystic PCOS.
Methods: This study was conducted with 110 women with PCOS who applied to a private clinic in Istanbul between 1 June and 30 July 2024 and who were not pregnant, lactating, or menopausal. Individuals were evaluated with a demographic information form of 18 questions, a dietary habits form of 19 questions, and a Food Craving Questionnaire (FCQ-T) of 39 questions and 9 sub-dimensions. Biochemical parameters (HOMA-IR, fasting blood glucose) and anthropometric values (height, weight, waist circumference) measured during 12 hours of fasting were determined.
Results: The study included 110 individuals with a mean age of 30.62 ± 13.34 years, a mean body mass index (BMI) of 26.75 ± 4,54 kg/m2 (2.7% participants with underweight, 29.7% participants with normal weight, 42.3% participants with overweight, 24.3% participants with obesity). Fifty percent of the women had a waist circumference ≥88 cm and were in the high-risk range. The mean fasting glucose was 91.82±11,59 mg/dl and the HOMA-IR value was 2.73± 1.1. The mean total score of the FCQ-T was 147.10±40.5. There was no statistically significant difference in the total score of the FCQ-T scale according to BMI, HOMA-IR, and fasting glucose (p=0.068; 0.083; 0.337, respectively). As BMI increased, HOMA-IR value (r:0.487; p=0.00) and fasting blood glucose (r:0.189; p=0.024)increased significantly.
Conclusion: The desire to eat is high in individuals with PCOS. Although no correlation was found between craving score and biochemical parameters in our study, it should be remembered that individuals with PCOS are at risk for weight gain. Dietitians who consider individuals' food cravings when developing a nutrition plan can enhance the effectiveness of the treatment process.

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Tab. 1. Correlation Between Scales.

No	Variables	1	2	3	4	5
1	BKI	1				
2	Age	.250**	1			
3	HOMA-IR	.487**	.290**	1		
4	FBG	.189*	.186*	.396**	1	
5	FCQ-T	.144	.088	.135	-.041	1

FBG: fasting blood glucose, FCQ-T: Food Craving Questionnaire, Spearman's rho * Correlation is significant at the 0.01 level (1-tailed) ** Correlation is significant at the 0.05 level (1-tailed)

PO4.239

The Interdependent Roles of β-cell Glucose Sensitivity and Insulin Sensitivity in Maintaining Glucose Homeostasis across a Spectrum of BMIs

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Objective: This study aimed to elucidate how β-cell glucose sensitivity, insulin clearance, and insulin sensitivity collectively influence glucose tolerance in individuals with varying degrees of body mass.
Methods: A cohort of 54 healthy individuals (age: 44 years [IQR 27-56], 63% female, BMI: 24.5 kg/m² [IQR 21.9-28.7], HbA1c: 33.26 mmol/mol [IQR 32.13-35.51]) underwent a 3-hour oral glucose tolerance test (OGTT). The study population included individuals across a range of BMIs, encompassing patient with and without obesity. Mathematical modeling of OGTT data enabled the assessment of β-cell glucose sensitivity, insulin clearance, and insulin sensitivity. Subsequently, linear regression analyses were conducted to examine the relationship between these metabolic parameters and glucose tolerance.
Results: Our analysis revealed that β-cell glucose sensitivity was a strong predictor of glucose tolerance during the OGTT (IQR increase effect: -87 mg/dL; 95% CI -141, -32; p = 0.003). Notably, individuals with diminished β-cell glucose sensitivity exhibited the greatest variability in glucose tolerance, with some approaching diabetic ranges despite others demonstrating effective glucose control. This variability was significantly influenced by insulin sensitivity (IQR increase effect: -49 mg/dL; 95% CI -68, -31; p <0.001), which emerged as a crucial modifier of the relationship between β-cell glucose sensitivity and glucose tolerance (interaction term p = 0.035). While not reaching statistical significance, a trend towards impaired glucose tolerance was observed in individuals with higher insulin clearance (i.e., lower insulin levels). Further analysis revealed that among individuals with low β-cell glucose sensitivity, those with higher insulin sensitivity tended to be younger, female, and have lower BMI and waist circumference, along with reduced fasting insulin levels.
Conclusions: Maintaining optimal β-cell glucose sensitivity is essential for regulating glucose tolerance following a glucose challenge, particularly in individuals with elevated BMIs. While robust β-cell function can often offset the effects of reduced insulin sensitivity, our results underscore the critical role of insulin sensitivity in individuals with compromised β-cell function. This highlights the need for interventions that enhance insulin sensitivity, such as weight management and physical activity, in preventing and managing obesity-related dysglycemia. Future investigations should explore the impact of weight loss interventions on β-cell glucose sensitivity and insulin clearance in individuals with obesity across the spectrum of glucose tolerance.

PO4.240

Metabolic score for insulin resistance (METS-IR) and visceral fat (METS-VF): exploring their predictive utility for insulin sensitivity and adiposity in White European and Black African populations

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Introduction: Reduced insulin sensitivity (IS) and increased visceral adipose tissue (VAT) are critical determinants of the metabolic complications of obesity. Nevertheless, their accurate assessment remains complex, expensive, and limited in accessibility. The Metabolic Score for Insulin Resistance (METS-IR) and the Metabolic Score for Visceral Fat (METS-VF) are emerging as inexpensive, practical indices for addressing this gap. Although these metrics have been applied in White European (WE) populations, their performance in Black African (BA) populations—who develop impaired IS and type 2 diabetes (T2D) at lower levels of VAT—remains insufficiently explored. This study aims to evaluate the utility of METS-IR in estimating IS and METS-VF in predicting VAT across both WE and BA populations with varying degrees of glucose tolerance (GT).
Methods: Data were collected from 96 men across a spectrum of GT, including 49 WE (23 normal GT, 9 impaired GT and 17 with T2D) and 47 BA (19 normal GT, 10 impaired GT, 18 with T2D). Participants underwent a 2-step hyperinsulinaemic-euglycaemic clamp and Dixon magnetic resonance imaging (MRI) to assess IS and VAT, respectively. Fasting venous blood samples were collected to measure serum triglycerides, high-density lipoprotein cholesterol, and plasma glucose. These variables, together with body mass index, were subsequently used to derive METS-IR and METS-VF scores using established formulae. Regression analyses were conducted in R Statistical Software (v4.2.1; R Core Team 2021) to assess the relationship between METS-IR and IS, as well as METS-VF and VAT. Ethnicity and glucose tolerance status were considered as covariates.
Results: METS-IR was significantly associated with IS across the entire sample (β = −0.0189, R2 = 0.43, p<0.001), with similar predictive strength observed in BA (β = −0.0154, R2 = 0.36, p<0.001), and WE (β = −0.0215, R2 = 0.49, p<0.001). Interaction analysis indicated no significant moderation by ethnicity (p = 0.18). METS-VF demonstrated strong associations with VAT in the overall sample (β = 39.35, R2 = 0.56, p<0.001), with predictive differences between BA (β = 27.87, R2= 0.53, p<0.001) and WE (β = 43.57, R2= 0.63, p<0.001). The overall predictive utility of both scores for IS and VAT remained significant across GT categories.
Conclusion: METS-IR and METS-VF accurately predicted insulin sensitivity and visceral adiposity in BA and WE populations. While METS-VF demonstrated slightly reduced predictive strength in BA compared with WE, it remained a robust predictor in both groups. Both scores also demonstrated consistent predictive utility for IS and VAT across all GT categories. Further studies are needed to investigate the role of these indices in metabolic disease prevention.

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PO4.241

Understanding the care pathway for obesity through patient and healthcare professional perspectives—results from the French OPTIM national survey

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Introduction: The prevalence of obesity in France has surged significantly, with nearly half of adults classified as overweight or obese by 2024. This study aims to identify the gaps between national recommendations for obesity care and the expectations of participants with obesity (pwO) and healthcare professionals (HCPs), while also exploring pwO's experiences and unmet needs in the management of obesity.
Methods: The OPTIM (Obesity Pathways for Treatment and Integrated Management) used a mixed-methods approach, combining quantitative approaches and qualitative interviews. The populations included 150 pwO and 141 HCPs, randomly selected based on specific criteria. Data was collected via online questionnaires and semi-structured interviews, with a focus on care pathways, therapeutic interventions, and barriers to effective management.
Results: 71% of pwO reported having a comorbidity with respectively 38%, 33% and 29% of them having respectively one, two or more than two comorbidities. PwO reported low satisfaction with available treatment options. Average satisfaction scores ranged from 4.8/10 for bariatric surgery to 6.2/10 for coached physical activity, despite a high need for support, especially in independent physical activity (5.8/10). HCPs highlighted pwO mindset and limited consultation time as major barriers to initiating treatment. Only 16% of HCPs found the available therapeutic options to be satisfactory overall. However, pwO receiving care in centers for obesity management reported higher satisfaction due to better follow-up care and comprehensive support.
Conclusion: The OPTIM survey reveals significant gaps between the French national recommendations for obesity management and the practical experiences of both pwO and HCPs. Improving obesity care requires enhanced education on treatments, clearer care pathways, and efforts to reduce societal biases and stigma surrounding obesity.

PO4.242

Obesity and multifactorial chylomicronemia syndrome after 5-fluorouracil in patient with colorectal cancer (Case report)

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Introduction: A meta-analysis of 66 studies showed that overweight and obesity significantly increase colorectal cancer risk revealing a 25–57% (Ungvari et al. 2024). Therefore management of colorectal cancer in patients with obesity (OB) requires a multidisciplinary approach to treatment.
Method: We reported the case of a 47-year-old female patient with abdominal obesity, a history of hypothyroidism and impaired fasting glucose, and liver steatosis, after sigmoidectomy for metastatic colorectal cancer (mCRC), where the treatment with capecitabine and 5-fluorouracil induced severe HTG repeatedly. Her preoperative triglyceride (TG) level was 19.7 mmol/l, however after the first cycle of chemotherapy with Capecitabine fasting serum TG increased to 42 mmol/l, total cholesterol to 13.5 mmol/l, the fasting plasma glucose (FPG) was 5.8 mmol/l with a glycated hemoglobin of 6.63%, which indicated newly diagnosed Type 2 diabetes mellitus (T2DM). We proposed that the patient suffers from multifactorial chylomicronemia syndrome (MCS), where HTG was triggered by secondary factors (capecitabine and fluorouracil therapy, untreated T2DM, suboptimal hypothyroidism treatment, obesity, weight gain and high fat, high carbohydrate diet).
Results: In managing the patient, the dose of L-thyroxine was subsequently adjusted. Statins, fenofibrate, ezetimibe, and metformin were added to the therapy, with the recommendation of a very low-fat reduction diet. Nevertheless, metastasis in the liver and lungs appeared, followed by FOLFIRI chemotherapy and biological treatment (cetuximab). The second period of HTG was detected (TG 55.3 mmol, total cholesterol 11.0 mmol/l). Afterward, she started 2nd line of chemotherapy with mFOLFOX6 (Oxaliplatin in reduced dose to 80% because of the liver steatosis a risk of neuropathy). The patient underwent liver segmentectomy (S2/3), biological therapy again, and subsequently next segmentectomy and lung resection due to mts she underwent. Recently (in Oct. 2024) again mts in the liver were recognized and she started again with biologic therapy. However, the prognosis of the patients remains unclear. **Conclusion:** The case report refers to the syndrome of multifactorial chylomicronemia, formerly referred to as type V hyperlipoproteinemia. It is a polygene-related disorder of lipid metabolism, which may be exacerbated by secondary factors (obesity, uncontrolled diabetes, excessive intake of fat, and simple carbs), as was the case of our patient. The case report points out the need for multidisciplinary management of patients with HTG or MPSC as well as a strict adherence to regime and dietary recommendations. We strongly suggest that the level of TG should be monitored before and during the therapy.

Reference

Ungvari, Z., Fekete, M., Varga, P. et al. Overweight and obesity significantly increase colorectal cancer risk: a meta-analysis of 66 studies revealing a 25–57% elevation in risk. GeroScience (2024). https://doi.org/10.1007/s11357-024-01375-x.

PO4.243

Nitric oxide associated network modulation as an adaptive mechanism in Egyptian with obesity

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Introduction: While Obesity is a major health challenge in Egypt and worldwide. Current pharmacotherapies focus on treating symptoms instead of underlying causal mechanisms. Here, we investigated the role of nitric oxide (NO) associated network of genes in Egyptian participants with obesity.
Methods: In the present study, the in-silico analysis, based on the protein-protein interactions, identified arginase 2 and fatty acid synthase as network genes within the two main nitric oxide synthase (NOS) isoforms; NOS2 and NOS3. Then, a case control study was carried out to confirm the association and investigate the role of this network in Participants with obesity or diabetes. The study consists of three groups (25 subjects each); participants with healthy life, participants with obesity, participants with diabetes. Individual characteristics, as well as parameters reflecting obesity (body weight, BMI), glycemia (HA1c) and hypertension (SBP, DBP) were reported.
Results: Plasma nitrite level (NO) was gradually increased in participants with obesity and significantly increased in participants with diabetes. On the other hand, arginase 2, an enzyme that degrades NOS substrate, level decreased gradually in participants with obesity and significantly in participants with diabetes. In addition, fatty acid synthase level decreased

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gradually in participants with obesity and significantly in participants with diabetes. Furthermore, there was a significant correlation between arginase 2 and fatty acid synthase levels in the whole participants.

Conclusion: The study findings suggest that nitric oxide/arginase/fatty acid synthase network is modulated in obesity and diabetes as a body defensive mechanism against obesity complications.

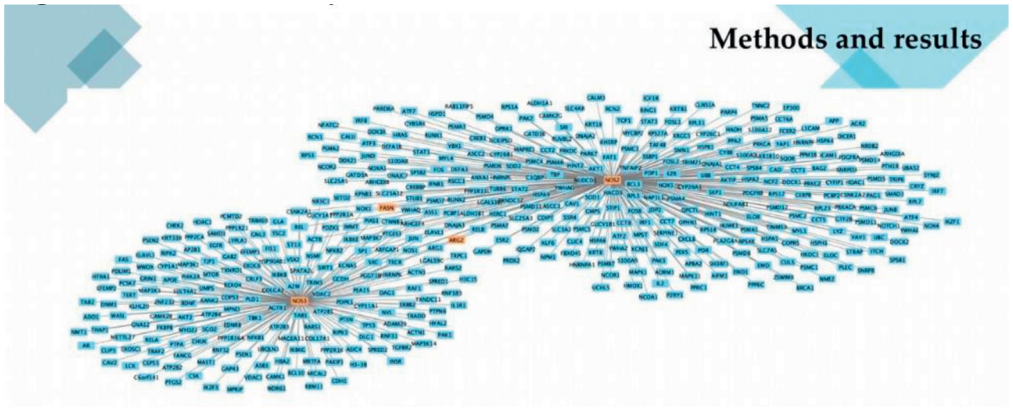


Fig. 1. Nitric oxide synthase disease module.

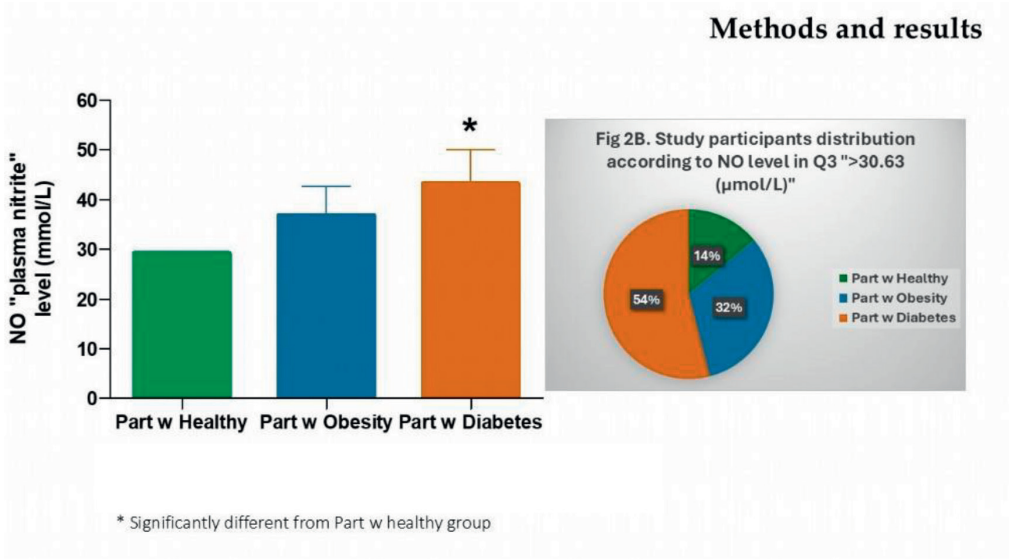


Fig. 2. Plasma nitrite (NO) levels in the studies groups.

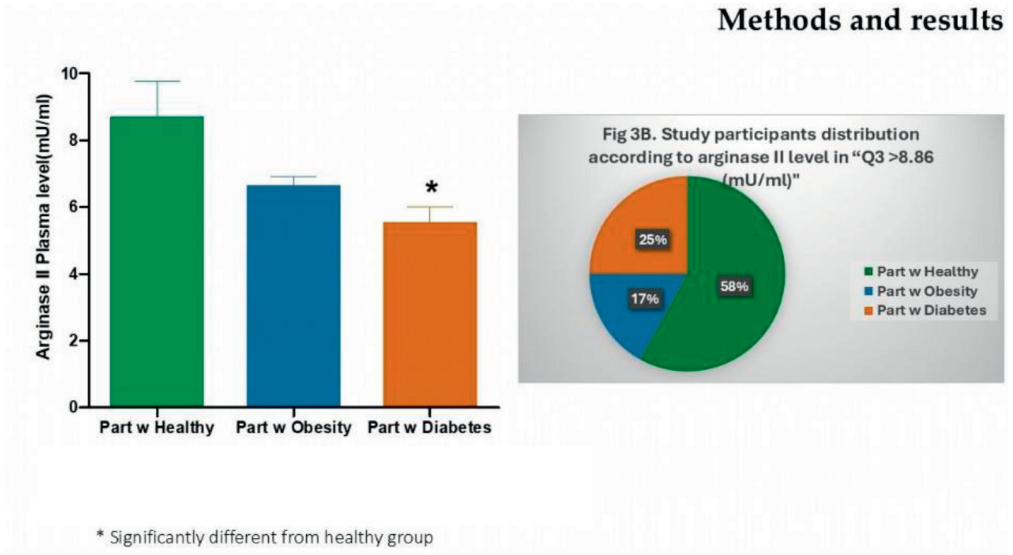


Fig. 3. Plasma arginase II levels in the studies groups.

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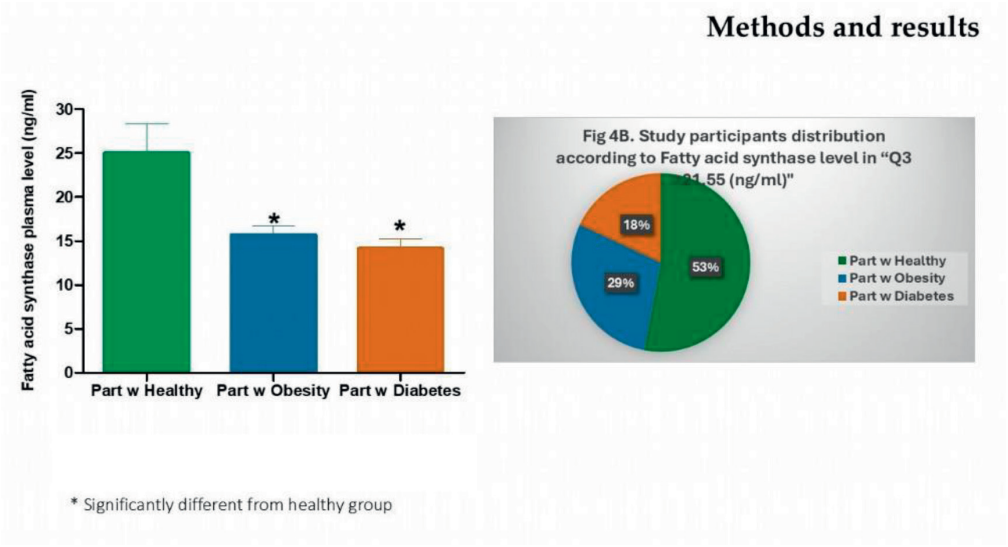


Fig. 4. Plasma fatty acid synthase levels in the studies groups.

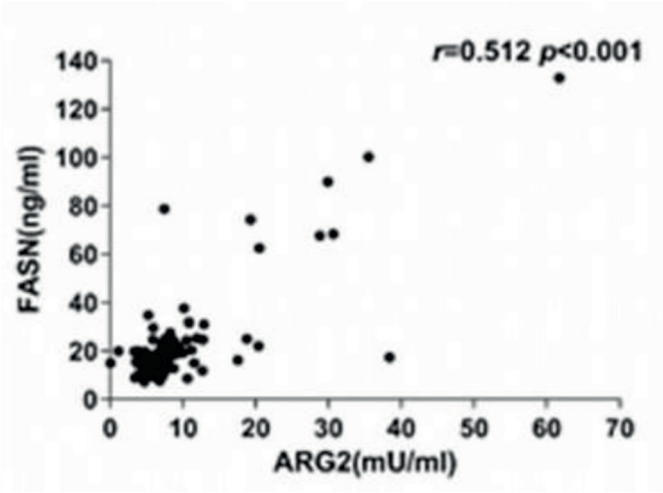


Fig. 5. Correlation analysis between fatty acid synthase (FAS) and arginase II levels.

PO4.244

GLP1R gene variant and gender affect response to semaglutide treatment in severe obesity

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Objective: To identify whether the GLP1R gene variant rs6923761G>A has an influence on semaglutide response in individuals living with severe obesity.

Methods: From March 2023 to July 2024, we prospectively genotyped 112 patients treated with semaglutide 2.4 mg weekly. All patients had been treated over 4 months for grade 3 obesity (body mass index ≥ 40 kg/m2).
Results: The frequency of rs6923761 AA variant was 9/112 patients (8%), GA was 42/112 (37.5%) and GG was 61/112 (54.5%). The mean weight loss kinetics was 1.64±0.78 Kg/month in homozygotes of variant A, in comparison to an average weight loss of 1.04±0.79 Kg/month in carriers of at least one G variant (p=0.03). Multivariate analysis demonstrated that rs6923761G>A SNP and gender were independent predictors of weight loss. The rate of weight loss in women homozygous for the A allele was more than double that observed in men carrying the G allele (1.89±0.75 Kg/month versus 0.7±0.7 Kg/month, p=0.0009)
Conclusions: Patients carrying the A allele at SNP rs6923761G>A appear to show greater weight loss in response to semaglutide in people living with severe obesity without diabetes. This effect seems to be combined with a gender effect on weight loss.

PO4.245

Psychological Intervention with Virtual Reality Exposure and Exercise Training to Reduce Social Physique Anxiety in Women with Obesity: A Randomized Controlled Feasibility trial

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Introduction: High levels of social physique anxiety (SPA) can lead to social isolation, mental health disorders, and reduced physical activity participation, especially in women with obesity. Psychological intervention developed to address SPA in this population are lacking. This randomized controlled trial aimed to 1) assess the feasibility and acceptability of the study protocol and a psychological intervention with virtual reality exposure and exercise training, and 2) explore the effects of this intervention on SPA, body appreciation (BA) and weight bias internalisation (WBI).
Methods: Forty-five participants (Mage=39.3±5.7 years; MBMI=40.2±5.3 kg/m²) were randomly assigned to one of three groups: 1) ET+VR (exercise training + psychological intervention with cognitive restructuring

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[2 sessions with virtual reality exposure]), 2) ET+S (exercise training + psychological supportive intervention [active listening, reflection of feelings, reformulation]), 3) WL (no intervention wait-list; randomized into ET+VR or ET+S after 12 weeks). Participants were offered to complete over 12 weeks: 1) eight weekly psychological intervention sessions from week 1 to 6, and at weeks 9 and 12, 2) 24 supervised endurance training sessions (twice per week), and 3) assessments at baseline (T1), post-intervention, (T2), and 6-months post-intervention (T3). Each session was provided individually in person and lasted approximatively 45 minutes. WL participants also completed an assessment after waiting time (T1wait). Feasibility was evaluated based on retention rates (i.e., % of participants completing T2 assessments) and attendance rates (i.e., % of intervention sessions completed). Anticipated and retrospective acceptability of the intervention were assessed using a questionnaire based on the Theoretical Framework of Acceptability. Intervention effects were analyzed using data from the SPA scale, BA scale-2, and Modified WBI Scale. Analysis 1 compared the 3 groups' data from T1 to T2 (T1wait for WL) and Analysis 2 compared ET+VR and ET+S group data (including reassigned WL participants) from T1 (T1wait for WL) to T2 and T3 (Figure 1).

Results: The retention and attendance rates for each group were 87%, and > 88%, respectively. Means for anticipated and retrospective acceptability of the VR+ET intervention were 3.0±0.3 and 3.1±0.3, respectively, out of 4. Analysis 1: A statistically significant time x group interaction effect was found for SPA ($F(2, 37)=4.9$, $p=.013$, $\eta_2p=.21$), BA ($F(2, 37)=9.7$, $p=.000$, $\eta_2p=.34$) and WBI ($F(2, 37)=7.0$, $p=.003$, $\eta_2p=.27$) with greater improvements in VR+ET compared to the two other groups. Analysis 2: A statistically significant time effect for SPA ($F(2, 33)=21.3$, $p=.000$, $\eta_2p=.57$), BA ($F(2, 33)=23.4$, $p=.000$, $\eta_2p=.59$) and WBI ($F(2, 33)=19.1$, $p=.000$, $\eta_2p=.53$) was found with better scores at T2 and T3 compared to T1 in both groups; no time x group interaction effect was found.

Conclusion: Results support the feasibility and acceptability of the study protocol and VR+ET intervention. This intervention demonstrated preliminary efficacy in improving SPA, BA and WBI, improvements that seem maintained 6 months post-intervention.

PO4.246

Patient Reported Outcomes and Quality of Life in obese patients utilizing anti-obesity medications adjunct to lifestyle modification at King Fahad Armed Forces Hospital, Jeddah, Saudi Arabia

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Background: Patient health may be negatively impacted by significant illnesses and complications resulting from untreated obesity. This project evaluated the efficacy of pharmacological therapy adjunct to lifestyle optimization among obese patients, a project of improvement at King Fahad Armed Forces Hospital, Jeddah, in the Endocrine and Diabetes Department.

Methods: Retrospective cohort data collection was conducted for baseline assessment and the required measures. The project was conducted with weight assessment at 3, 6 and 12 months, while on the ant-obesity treatments medication and action plans carried out accordingly. After that, a questionnaire was conducted to assess the quality-of-life change after the intervention.

Interventions: We performed a retrospective cohort analysis of adults or adolescents with obesity who are on pharmacological therapy as Glucagon-like peptide-1 receptor agonists (GLP-1 therapy) adjuncts to life style modification and being followed up at KFAFH outpatient's clinic, who have used anti-obesity treatment for at least three to six months with lifestyle modifications and compliant to the treatment. We performed a retrospective medical records review for the baseline data (age, weight in kg, body mass index, haemoglobin A1c) before the initiation of the intervention. Then, the post-intervention data were compared. A questionnaire was conducted to assess obesity effect on patient's quality-of-life post- intervention. The potential cost of care savings was also calculated.

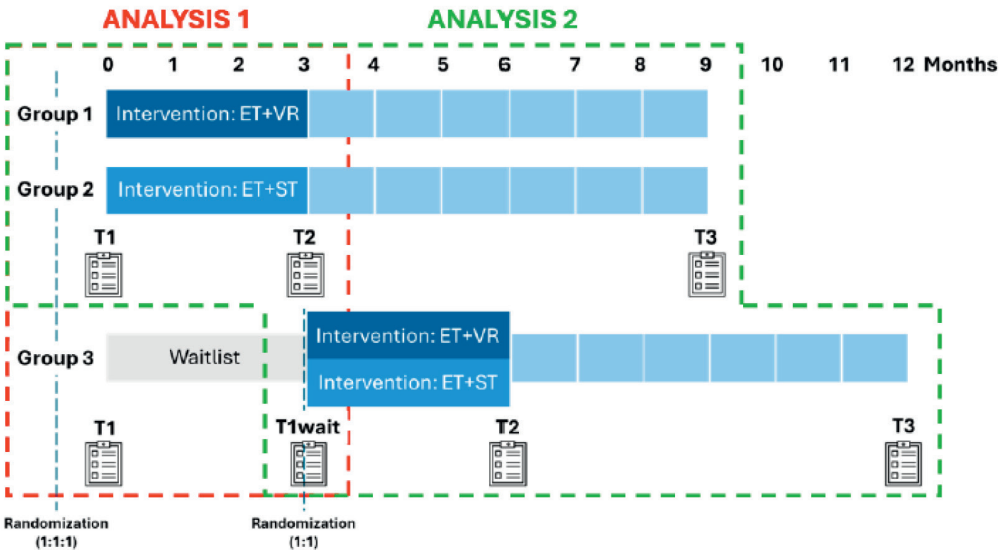


Fig. 1. Protocol and analyses explantations.

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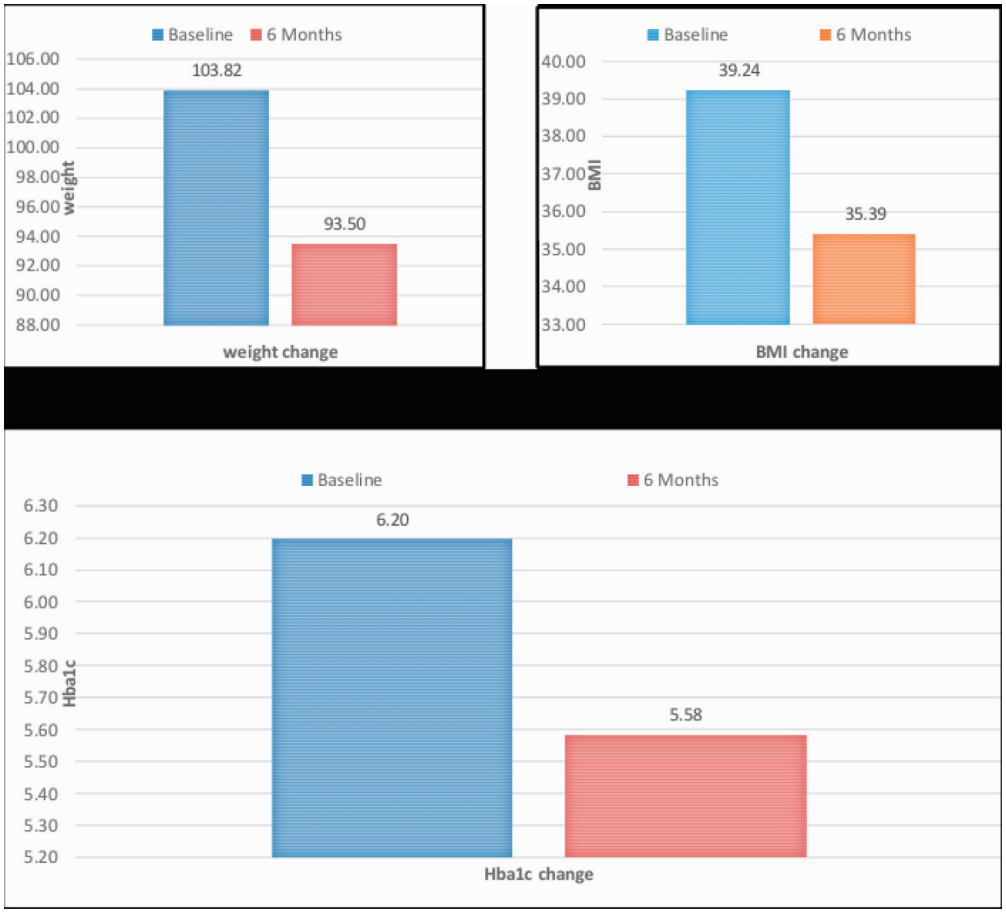


Fig. 1. Effect of liraglutide on mean change of weight (kg) and BMI and Hba1c (A, B, C) after anti-obesity treatment compared to the baseline.

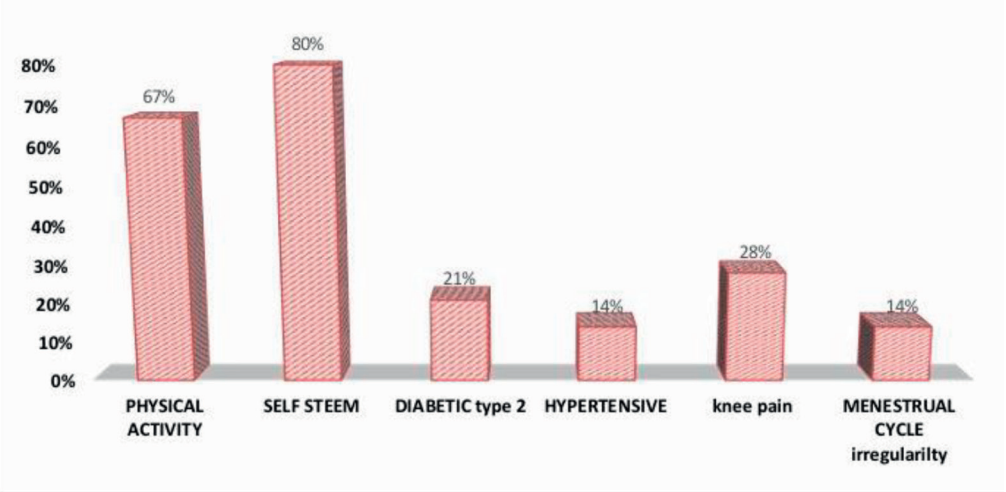


Fig. 2. Percent of various quality of life parameters improvement after weight loss.

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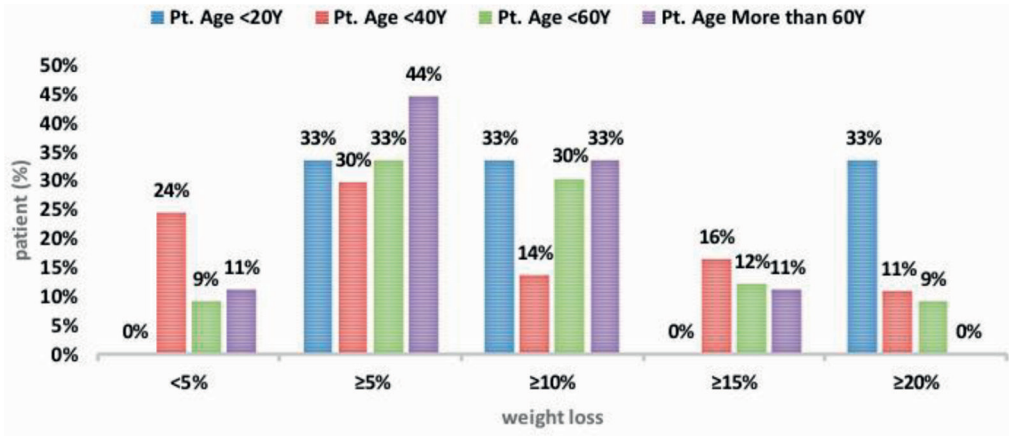


Fig. 3. Percent of weight loss by age categories.

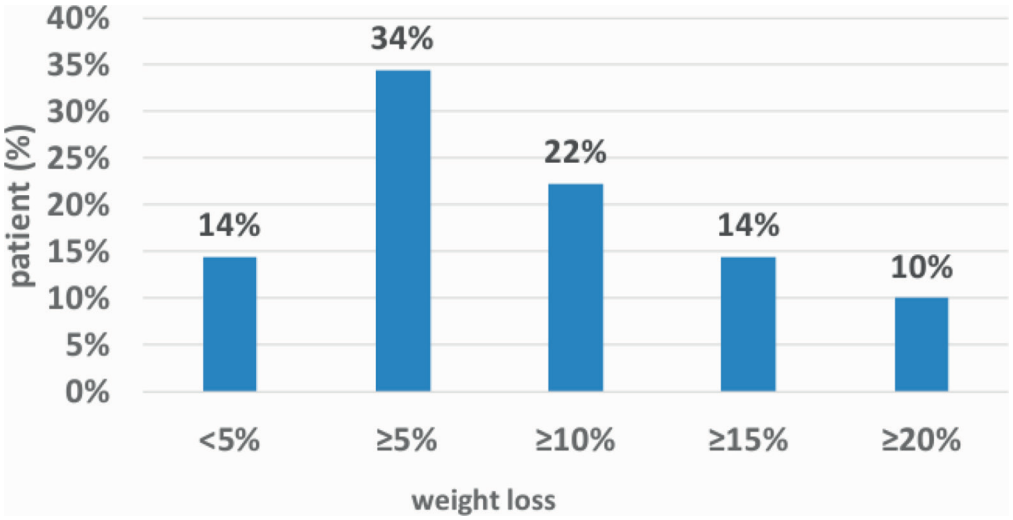


Fig. 4. Percentage of weight loss.

BMI	5%	No.of Pt.		10%	No.of Pt.		15%	No.of Pt.		20%	No.of Pt.	
	$69.35	3		$56.18	0		-$41.36	0		-$234.91	0	
	$130.67	0		$169.27	0		$120.11	0		-$23.22	0	
	$202.24	0		$297.58	3		$290.53	2		$203.35	0	
	$288.31	1		$448.01	2		$501.28	0		$455.02	0	
	$394.43	0		$629.35	0		$740.61	0		$736.68	1	
	$528.04	5		$853.15	2		$1,030.07	2		$1,086.61	0	
	$699.23	3		$1,134.86	4		$1,388.09	0		$1,502.48	0	
	$921.94	4		$1,495.47	3		$1,839.44	1		$2,018.76	0	
	$1,215.61	3		$1,963.90	1		$2,417.84	1		$2,671.80	0	
	$1,607.65	5		$2,580.43	1		$3,169.87	1		$3,511.42	0	
	$2,137.15	3		$3,401.82	0		$4,160.56	0		$4,606.71	1	
	$2,860.36	1		$4,508.81	0		$5,481.72	0		$6,054.71	0	
	$3,859.08	1		$6,017.45	1		$7,264.29	0		$7,993.11	0	
	$5,253.41	3		$8,096.24	0		$9,697.03	0		$10,619.51	0	
	$7,221.58	1		$10,992.29	0		$13,054.84	0		$14,220.46	0	
	$10,030.69	4		$15,071.78	4		$17,742.27	0		$20,229.05	0	
		4	$40,122.76		4	$60,287.12		2	$35,484.54		2	$40,458.10
Total Cost Saving	$136,965.30			$143,656.90			$45,552.89			$45,801.49		
Total	371967.6											

* We calculated the cost saving in BMI as being equivalent to 45. although the higher the BMI. the higher the expenditure. (21)

Fig. 5. Predicted changes in total annual medical expenditures ($US) associated with a given percent reduction in BMI.

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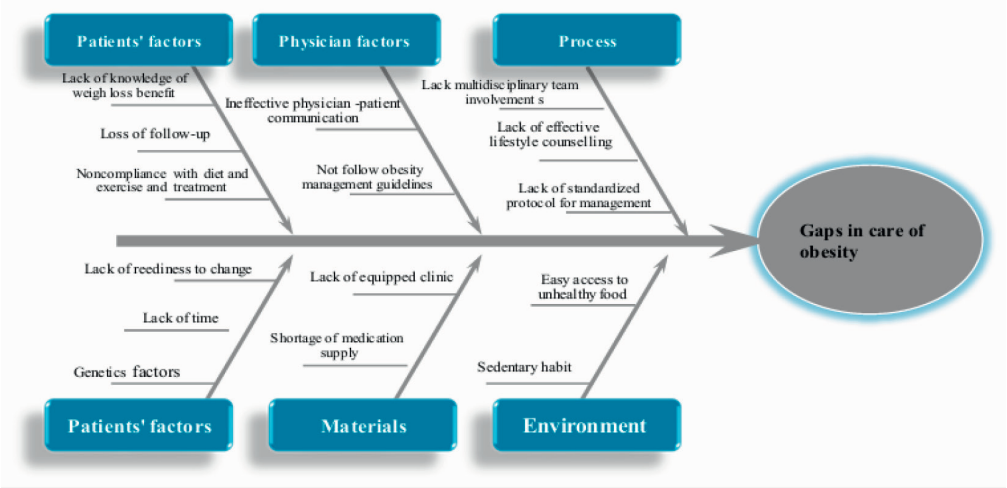


Fig. 6. the root causes of gaps in obesity care.

Results: We performed a retrospective analysis of 90 patients with an obesity diagnosis (BMI >30) using obesity treatment. Percentages of patients who reached weight loss of at least 5%, 10%, 15% and more than 20% were 34%, 22%, 14% and 10%, respectively, following adjunct treatment with medication. Weight loss of 5-10% was the highest in people aged > 60. The overall effect of the intervention on mean changes in weight (kg) and BMI from the baseline were -10.3 and 3.85, respectively. There was a reduction in HbA1c from 6.2% to 5.5% with a mean change of 0.62%. Patients who lost weight showed the greatest improvement 80% in their self-esteem and 67% became physically active 67%. Patients lost weight reported improvement in their quality of life and reduction in obesity comorbidities.
Conclusions: In summary, anti-obesity treatment adjunct to lifestyle resulted in significant weight loss among obese individuals. This treatment was also associated with improvement of quality of life and improvement of obesity related comorbidities.

PO4.247

Phase angle, Vitamin D and CRP levels in Women in Premenopausal Stage with Obesity: The Impact of Hashimoto's thyroiditis

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Group for Nutritional Biochemistry and Dietology, Center of Research Excellence in Nutrition and Metabolism, Institute for Medical Research, National Institute of Republic of Serbia, University of Belgrade, Belgrade, Serbia

Introduction: Obesity is associated with inflammation, increased fat mass, and cellular alterations, which can impact phase angle values-a marker of cellular health derived from bioelectrical impedance analysis.
Methods: This study involved participants with obesity (97 women in premenopausal stage), divided into two groups: participants with Hashimoto's thyroiditis (n = 42) and participants without the condition (n = 55). The control group consists of participants (n = 30 women in premenopausal stage) who are not overweight and do not have any associated diseases.
Results: Participants with Hashimoto's thyroiditis had significantly lower phase angle (PhA) values and higher CRP levels compared to participants with normal thyroid function ($p \leq 0.01$). Similarly, participants with obesity but without Hashimoto's thyroiditis also demonstrated lower PhA values and elevated CRP levels compared to participants with healthy status ($p \leq 0.05$). Additionally, vitamin D levels positively correlated with PhA and negatively with the participant's body fat percentage.
Conclusion: These results suggest that vitamin D may influence cellular integrity and body composition in women in premenopausal status. By integrating PhA monitoring and vitamin D status, healthcare professionals can develop more effective, personalized strategies for managing obesity and improving overall health outcomes, particularly in individuals with thyroid dysfunction. These findings emphasize the importance of cellular health and inflammatory markers in tackling weight-related health challenges.

PO4.248

Genetic variants in obesity-related genes have a cumulative effect on weight loss outcomes following bariatric surgery

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Introduction: Obesity is a multifactorial disease, where genetics plays an important role. Bariatric surgery (BS) is a mainstay for treatment that causes significant weight loss and metabolic improvements, although 20-30% of operated patients do not achieve the desired results. We hypothesized that a higher genetic burden favouring obesity might reduce the likelihood of optimal post-BS outcomes.

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Our aim was to analyse the association between variants in 17 genes involved in obesity and weight loss in patients elected for BS.
Methods: In this retrospective cohort study, 51 patients submitted to BS were recruited at CHUC's Endocrinology unit (46.4±10 years, BMI 45.8±6.2 kg/m², 75% women, 43% sleeve and 57% RYGB). Total weight loss percentage (%TWL) at 1Y and 2Y post-BS were calculated. Linear regression and correlation assessed clinical influences on %TWL. DNA sequencing (IonS5 NGS) of 17 obesity-related genes. Common variants (MAF>5%) obesity-related or exonic were studied. %TWL variation between genotypes was evaluated by ANOVA. Hardy-Weinberg equilibrium (HWE) was tested, associations between variants and %TWL were evaluated under genetic models. Risk alleles linked to lower %TWL were used to create an unweighted Genetic Risk Score (GRS), categorizing participants into high/low GRS.
Results: We evaluated weight loss post-BS in 51 participants (%TWL1Y=32.8%±9.2; %TWL2Y=33.9%±10.9). Linear regression analysis revealed that higher pre-BS BMI, younger age, and no T2D predicted higher %TWL. From NGS results, 25 variants were analysed after the HWE test. After adjustment, multivariate regression analysis shows that AArs1042571 (p=0.03) and TTrs6265 (p=0.02) are associated with a higher %TWL1Y, and the associations hold for %TWL2Y, under the recessive model. Moreover, GGrs2241759 (p=0.03) is associated with a lower %TWL2Y, and rs6235 (p=0.03) and rs6234 (p=0.03) heterozygous genotype has a better %TWL. Considering the genetic model, we confirmed the association of the variants with %TWL, supporting its influence in short- and long-term outcomes. The cumulative effect of risk alleles on %TWL was assessed by combining the 5 variants into a GRS to categorize as high or low-risk. Individuals with high-risk GRS have significantly lower %TWL1Y (p=0.03) and 2Y (p=0.007), confirmed by linear regression. The model with the 5 variants shows higher explanatory power for %TWL1Y and 2Y, compared with the univariate models, confirming the cumulative effect. Moreover, incorporating genetic data into the clinical model improved %TWL prediction, highlighting the value of genetic factors in BS outcomes.
Conclusion: We identified 5 genetic variants linked to weight loss at 1 and 2 years post-BS. Higher GRS was associated with lower %TWL, indicating that genetic burden impacts post-BS results. Combining genetic and clinical data improves predictions of BS results. Carriers of genetic variants predisposing to obesity may require tailored follow-up to optimize results, making their identification crucial for improving treatment strategies. Validation of these findings in a larger sample is warranted.

PO4.249

Effects of a Low-Carbohydrate Diet on Cardiometabolic Health: An 8-Year Longitudinal Study within the ELSA-Brasil Cohort

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Introduction: The leading cause of death worldwide in recent decades has been chronic non-communicable diseases such as hypertension and diabetes. These conditions are mainly caused by changes in cardiometabolic parameters, including blood lipid and glucose levels, and blood pressure. One of the main modifiable factors for the prevention and/or maintenance of cardiometabolic health is diet. Therefore, many macronutrient modifications have been widely debated, such as low-carbohydrate diet (LCD), which can help control cardiometabolic parameters and, more popularly, aid in weight loss. Despite extensive research on the effects of this diet, the results remain controversial. Therefore, the present study aims to investigate the effects of a low-carbohydrate diet on cardiometabolic health through an 8-year longitudinal study within the ELSA-Brasil cohort.
Methods: Data were collected at baseline (2008-2010) and wave 3 (2017-2019) of the ELSA-Brasil cohort. A total of 7508 individuals were analyzed. The low-carbohydrate diet (LCD) was classified based on the Brazilian Diabetes Society's guidelines (<45% of total energy intake from carbohydrates), and those not adhering to the LCD were termed "Usual". Participants were categorized by the incidence of low-carbohydrate diet adherence and by gender ("male" and "female"). For the longitudinal analysis, linear regression was applied to assess the association between low-carbohydrate diet adherence and changes in cardiometabolic parameters (Δ; difference between wave 3 and baseline). An adjusted model was utilized for each variable [weight (kg), BMI (kg/m²), HDL (mg/dL), total cholesterol (mg/dL), glucose (mg/dL), insulin (mg/dL), SBP (mmHg), and DBP (mmHg)].
Results: A total of 831 men (11%) and 1299 women (17.3%) with a mean age of 59 ± 8.7 years adhered to the LCD. Among women, LCD adherence resulted in an increase of 0.48 (95% CI: 0.2;0.7) in Δweight, 0.13 (95%CI: 0.1;0.3) in ΔBMI, 1.34 (95%CI: 0.5;2.1) in ΔHDL, and 3.36 (95%CI: 0.7-6.0) in Δtotal cholesterol. Additionally, there were decreases in Δinsulin [-0.98 (95%CI: -1.7; -0.2)], ΔSBP [-1.7 (95%CI: -2.6;-0.7)], and ΔDBP [-0.59 (95%CI: -1.2;-0.1)]. Among men, LCD adherence resulted in a decrease in Δinsulin levels [-1.73 (95%CI: -2.6;-0.7)].
Conclusion: Among women, adherence to LCD was associated with increases in Δweight, ΔBMI, ΔHDL, and Δtotal cholesterol, alongside decreases in Δinsulin, ΔSBP, and ΔDBP. In men, LCD adherence resulted in a decrease in Δinsulin levels. Our results suggest that LCD adherence may have differential effects based on gender, with potential benefits in improving specific cardiometabolic parameters.

Conflict of Interest: None Disclosed.

Funding: The study is supported by the Brazilian Ministry of Health (Department of Science and Technology) and Ministry of Science, Technology and Innovation (FINEP, Financiadora de Estudos e Projetos), grant nos. 01 06 0010.00, 01 06 0212.00, 01 06 0300.00, 01 06 0278.00, 01 06 0115.00 and 01 06 0071.00 and CNPq (the National Council for Scientific and Technological Development).

PO4.250

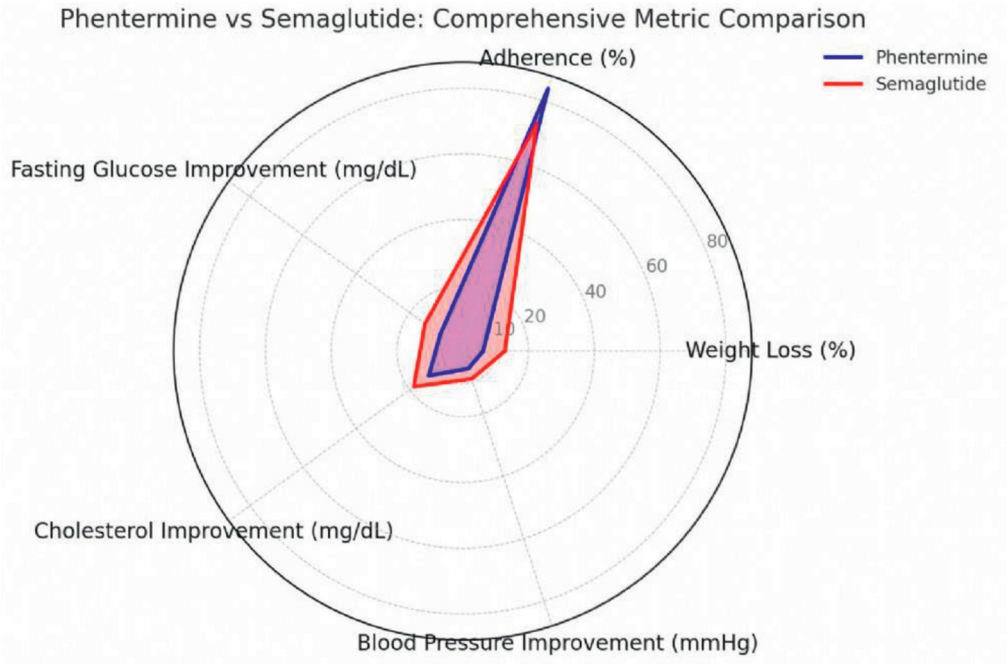
Phentermine (30 mg): A Cost-Effective Solution with Superior Adherence Compared to Semaglutide (1 mg) in Obesity Management—A 6-Month Study in Latin America

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Introduction: Obesity is a major health issue in Latin America, driven by genetic, socioeconomic, and environmental factors. Pharmacological treatments are crucial for patients unable to achieve meaningful weight loss through lifestyle changes alone. This study evaluates two options: 30 mg of phentermine and 1 mg of semaglutide, over six months. While semaglutide demonstrated superior efficacy, adherence was significantly higher with phentermine due to its affordability and accessibility, making it a key treatment in resource-limited settings.
Methods: The study included 100 adults aged 18–65 years with a BMI ≥30 kg/m². Participants were randomized into two groups: 50 received 30 mg of phentermine daily, and 50 received 1 mg of semaglutide weekly via subcutaneous injection. Both groups adhered to a low-calorie diet and moderate physical activity program. Outcomes included weight reduction, metabolic improvements (fasting glucose, cholesterol, blood pressure), adherence, adverse effects, and quality of life improvements measured using the SF-36 questionnaire.
Results: Weight Loss
Semaglutide resulted in an average weight loss of 12.8% (±3.1%), nearly double that achieved with phentermine, which showed a reduction of 6.2% (±2.5%) ($p < 0.001$).
Adherence
Adherence was significantly higher in the phentermine group (84%) compared to the semaglutide group (73%). The primary barrier to adherence with semaglutide was its high cost, making it unaffordable for many participants. Phentermine's affordability and availability ensured better treatment continuity.

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This radar chart provides a visual comparison of Phentermine and Semaglutide across five key obesity treatment metrics: weight loss, adherence, fasting glucose improvement, cholesterol improvement, and blood pressure improvement. The chart highlights Semaglutide's superior performance in weight loss and metabolic benefits, while Phentermine excels in adherence, emphasizing its affordability and accessibility. Shaded areas represent the relative strengths of each treatment.

Fig. 1.

Metabolic Improvements
Semaglutide demonstrated superior metabolic benefits, with reductions in fasting glucose (14.2 ± 4.1 mg/dL vs. 8.5 ± 3.2 mg/dL, $p < 0.01$), cholesterol (18.4 ± 6.3 mg/dL vs. 12.8 ± 5.6 mg/dL, $p < 0.05$), and blood pressure (8.9 ± 3.4 mmHg vs. 5.6 ± 2.1 mmHg, $p < 0.05$).
Quality of Life
Both groups experienced improvements in quality of life, but semaglutide showed greater gains in energy levels and physical function. However, phentermine's higher adherence resulted in more consistent benefits across participants.
Discussion: Semaglutide provided superior clinical outcomes but was hindered by low adherence due to its high cost, reducing its impact in low-income populations. Phentermine, being more affordable, achieved higher adherence, delivering moderate but reliable benefits, particularly in resource-limited settings.
Conclusion: While semaglutide offers unmatched weight loss and metabolic improvements, its high cost limits adherence and accessibility in Latin America. Phentermine demonstrated higher adherence due to its affordability, making it a practical and sustainable treatment option. Public health efforts should focus on reducing the cost of advanced therapies like semaglutide while optimizing the use of accessible options like phentermine to ensure equitable obesity care.

PO4.251

Neck circumference as a screening measure for identifying obesity in Korean adults

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Background: Neck circumference(NC) measurement is one of the simple screening measurements which can be used as an index of upper body fat distribution to identify obesity, and waist circumference(WC) measurement can be used as a measure to diagnose abdominal obesity
Objective: To evaluate the usefulness of neck circumference as an index of obesity in Korean adults while identifying its appropriate cutoff points and whether the cutoff points are related to the waist circumference standard as a screening criterion for abdominal obesity in Korean adults.
Methods: The study comprise 122 male and 287 female, aged beyond 18 years. Anthropometric markers of obesity were measured, including height, weight, waist circumference, and compared with neck circumference of the same subjects. obesity level was defined by body mass index-(BMI) > 25.0. Receiver operating characteristic(ROC) curve analysis, correlation analysis were the tests of significance done to analyze quantitative data.
Results: Neck circumference had a strong positive correlation ($p < 0.001$) with other relevant indicators in all subjects. At BMI of 25.0, males had neck circumference 39.9763cm while females had it at of 34.4018cm.
Neck circumference of 39.9834cm for men and 34.4018cm for women was the useful cutoff point to determine subjects with abdominal obesity
Conclusions: Neck circumference is potentially useful initial screening tool for obesity. A neck circumference ≥ 40cm in men and ≥ 34.5cm in women should be considered the cutoff point for obesity.

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PO4.252

Effects of chrono-nutritional patterns on weight loss and comorbidities remission after bariatric surgery in patients with severe obesity

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Introduction: Obesity is a chronic, relapsing disease which increases the risk of several non-communicable diseases. Until now the main focus has been on what and how much to eat but the timing of eating is as important for metabolism. Chrono-nutrition is an emerging field that explains how circadian rhythms, nutrition, and health interact together. The aim of this study was to observe how different chrono-nutritional patterns affect weight loss and comorbidities remission in patients who underwent bariatric surgery.
Materials-Methods: This retrospective longitudinal study included 75 patients with obesity who underwent bariatric surgery at the University Hospital of Padova, followed up for a period of 36 ±11 months after surgery. Data were collected from the patient's medical records in the hospital's database and from telephone interviews. According to their eating pattern patients were classified into 4 chronotypes (profile 1 included those patients who regularly consume three meals; profile 2 was characterized by consumption of the three main meals and two snacks; profile 3 consisted of those patients that eat all day and also at night; profile 4 considered those patients that continuously eat during the day, but not at night). R software (v4.4.0; R Core Team, 2024) was used in order to handle data, build clusters and check for correlations.
Results: The most frequent clusters were Cluster 2 and Cluster 4, with 33 patients each, together accounting for 88% of the population. It was demonstrated a significant weight loss from baseline at follow-up for all clusters, but there was not a significant difference in weight loss ($p = 0.15$) or BMI loss ($p = 0.14$) among clusters. Performing a linear regression model, we analyzed the effects of each variable on the outcome (BMI loss): cluster 3 displayed a lower weight loss compared to other clusters ($p=0.0487$). There was a significant remission of comorbidities from baseline to follow-up. Patients in Cluster 3 had a higher prevalence of diabetes, hypertension and OSAS. There was a significant difference in Epworth score between Cluster 2 characterized by a regular eating pattern and Cluster 4 characterized by an irregular eating pattern, with Cluster 4 showing more daytime sleepiness.
Conclusions: This study highlights the importance of chrono-nutritional patterns in patients with severe obesity following bariatric surgery. The lower weight loss in Cluster 3, characterized by irregular eating patterns, suggests that chrono-nutrition may play a role in weight regulation. Secondly, the significant difference in prevalence of comorbidities and in the Epworth score among clusters suggests the important impact of chrono-nutritional analysis in patients with obesity.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.253

Mental health, eating behaviour and obesity in Chilean university students

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Introduction: The evidence has suggested that both diet and physical activity may not be sufficient to explain the variability observed in obesity among university students (van Strien, 2018). This has led in recent years to an intensification of research into factors that go beyond the traditional concept of energy imbalance and explore the underlying causes of this phenomenon, such as the psychological and emotional aspects of eating (Wong L et al., 2020; Lazarevich et al., 2016; Dakanalis et al., 2023).
Methods: This research examines the relationship between emotional eating and stress symptoms in chilean university students, as well as determining the extent and distribution of emotional eating and stress levels in this population. The study received approval from the ethics committee of the involved institution. The sample consisted of 1.115 students (55.5% female) from different areas. To assess emotional eating and stress levels, participants completed a set of self-report questionnaires in person. The instruments used were the
Depression, Anxiety, and Stress Scales (DASS-21) for stress symthoms, the Dutch Eating Behaviour Questionnaire (DEBQ) for eating behaviour, and a sociodemographic questionnaire. Data analysis was performed using SPSS® v24 software.
Results: The main findings indicate that emotional eating scores were higher in females than in males, with a mean score of 2.74 (SD = 1.03) for female and 2.27 (SD = 0.89) for male($p < 0.001$). Stress levels were also higher in female students, with a score of 7.46 (SD = 4.96) compared to 6.05 (SD = 4.34) for male students ($p < 0.001$). Considering a cutoff score of 6 for the presence of stress symptoms, it was found that 55.2% of chilean university students did experience stress. A positive and significant relationship was found between emotional eating and stress symptoms ($p < 0.001$).
Conclusion: One in every two Chilean university students exhibits symptoms of stress. Furthermore, participants with higher levels of stress also demonstrated greater levels of emotional eating, particularly among females. If emotional eating is related to the presence of obesity, develop psychoeducational interventions to improve emotional eating and stress can help reduce obesity.

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PO4.254

Gastrointestinal Side Effects of Incretin-Based Anti-Obesity Medications: Insights from Healthcare Professionals and Patients' Experiences

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Introduction: Gastrointestinal (GI) symptoms are the most frequently reported adverse events of incretin-based Anti-obesity medications (AOM) (1). Dietary modifications have been suggested as a potential strategy to mitigate these symptoms (2,3). Yet, there is a lack of comprehensive knowledge and experience among healthcare professionals (HCPs) regarding management of GI side effects in patients treated with incretin-based AOM, highlighting the need to develop practical recommendations.

Objective: This study aims to gain an in-depth understanding of the perceptions and experiences of patients and HCPs regarding the GI side effects associated with incretin-based AOM treatment, focusing on the unique perspectives of these two populations.

Methods: A qualitative descriptive research design including two focus group sessions with seven HCPs [physicians (MD) and dietitians (RD)] and semi-structured interviews with eight patients who are treated with incretin-based AOM was performed. The interviews were analyzed using qualitative content analysis.

Results: Two major themes emerged from the study. The first theme revolves around the different characteristics of GI side effects, encompassing four sub-themes: (1) types of common GI side effects; (2) the timing of GI side effect occurrence; (3) challenges in diagnosis; and (4) their impact on quality of life and treatment continuity. The second theme focuses on strategies for the prevention and management of GI side effects during treatment with incretin-based AOM encompassing five sub-themes: (1) preliminary education; (2) tailored dose escalation; (3) dietary and lifestyle modifications for the treatment of specific GI symptoms; (4) medical therapy aimed to alleviate symptoms; and (5) multidisciplinary follow-up.

Conclusion: Newly identified characteristics of GI side effects have emerged, enabling a more comprehensive understanding of the phenomenon. Moreover, HCPs proposed detailed strategies for preventing and managing GI side effects. The insights gained could be beneficial for both HCPs and patients aiming to improve the quality of care and medication adherence.

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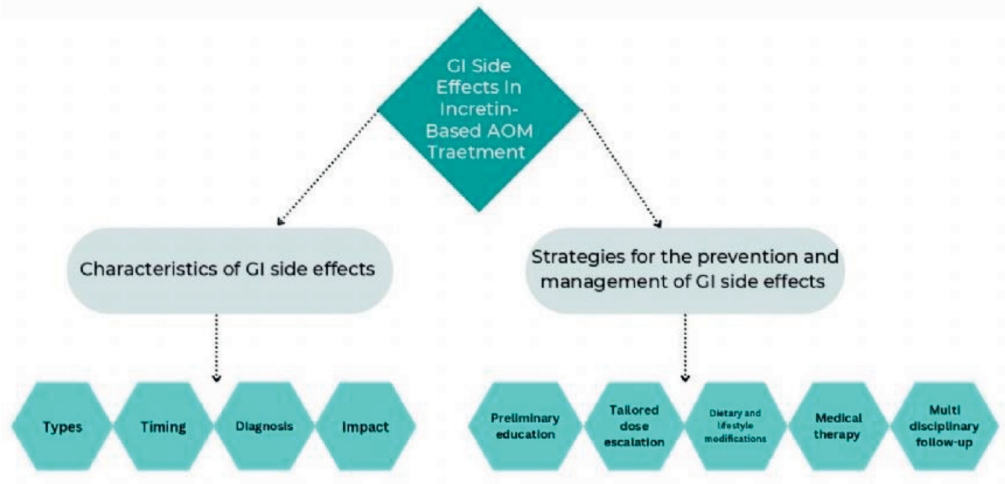


Fig. 1. Hierarchy of themes.

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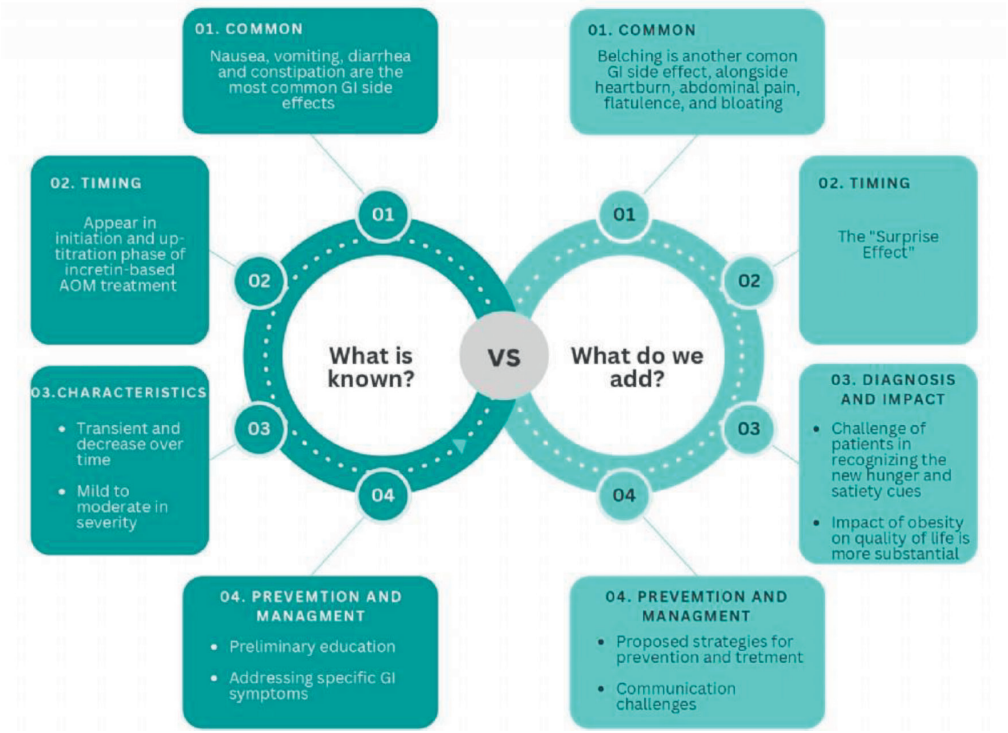


Fig. 2. Insights into gastrointestinal side effects of incretin based anti-obesity medications.

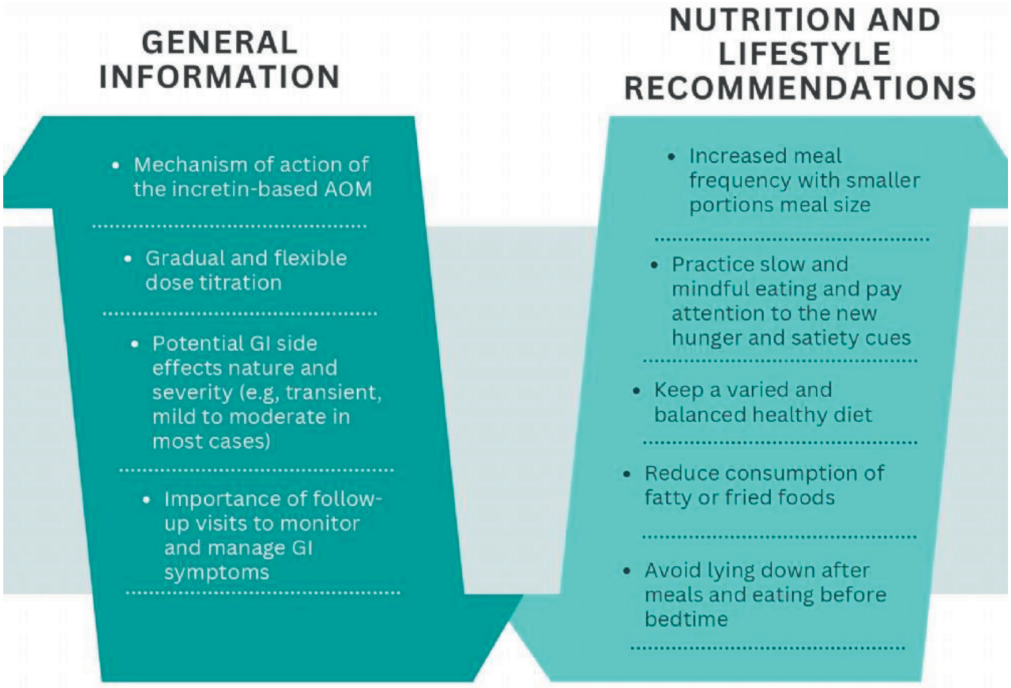


Fig. 3. Key elements of incretin-based anti-obesity medications pre-treatment education.

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PO4.255

Diabetes remission after 10 years of bariatric surgery: A follow-up of a randomized clinical trial comparing metabolic gastric bypass, sleeve gastrectomy and greater curvature plication

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Introduction: Long-term studies comparing the mechanisms of different bariatric techniques for type 2 diabetes (T2DM) remission are scarce. Our aim was to compare T2DM remission in patients with severe obesity 10 years after randomization to three different bariatric surgery techniques and to assess if the initial secretion of gastrointestinal hormones may predict metabolic outcomes at long term.
Materials-Methods: Forty-five patients with T2DM and severe obesity were randomized 1:1:1 to metabolic gastric bypass with a 200-cm biliopancreatic limb (mRYGB), sleeve gastrectomy (SG), and greater curvature plication (GCP). Registration trial: ISRCTN14104758. Anthropometric and biochemical parameters, fasting concentrations of peptide YY, ghrelin, glucagon, and area under the curve (AUC) of GLP-1 after standard meal test (SMT) were determined prior to and at months 1 and 12 after surgery. At 10-year follow-up, anthropometrical and biochemical parameters were determined.
Results: The baseline characteristics of patients were mean BMI of 39.4 ± 1.9 kg/m2 and HbA1c of 7.7 ± 1.9%. Total weight loss percentage (TWL%) after 1 year of the surgery was higher in the patients undergoing mRYGB (35.2%) than in SG (27.8%) and GCP (20.5%). TWL% at year 10 remained higher in the mRYGB group (26.41%) compared to SG (20.97%) and GCP (12.40%). T2DM remission was greater 1 year after the intervention in all groups and decreased over time. Complete T2DM remission 1 year after surgery was achieved in 80% of the patients in mRYGB group (n=12), 53.3% in SG (n=8), and 20% in GCP (n=3). Whereas at year 10, complete T2DM remission occurred in 33.3% of the patients in mRYGB group (n=5), 6.67% in SG (n=1), and 6.67% in GCP (n=1). From years 1 to 10, there was a T2DM relapse in 46.7% in mRYGB (n=7), 66.7% in SG (n=6) and 62.5% in GCP (n=5). GLP-1 secretion after the SMT increased at 1 and 12 months after surgery in all groups, but was significant only for the mRYGB group. Ghrelin and PYY fasting values were similar between groups at baseline and at month 1; however, fasting values of PYY and ghrelin were higher in the mRYGB group than in the SG and GCP groups at month 12 ($p < 0.05$), and no difference was observed between SG and GCP groups ($p > 0.05$).In the multivariate analysis, the GLP-1 AUC at 1 month was a favorable prognostic factor for complete T2DM remission at 10-year follow-up.
Conclusions: Long-term T2DM remission is mostly achieved with techniques with a hypoabsortive component such as mRYGB. Patients undergoing these techniques also had lower rates of T2DM relapse and achieved greater weight loss. Increased secretion of GLP-1 after surgery was a predictor of T2DM remission at 10 years.

PO4.256

Association between chronotype and non-alcoholic fatty liver disease indices

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Introduction: Chronotype, an individual's preferred sleep-wake cycle, is categorized as morning, evening, or intermediate. Evening types exhibit less healthy behaviors, including later sleep-wake times and increased late-day calorie intake. This disrupted circadian rhythm can lead to health issues like cardiovascular problems and metabolic disorders. Evening chronotypes often have a sedentary lifestyle, poor diet, and sleep disturbances, increasing their risk of obesity. This misalignment of the circadian rhythm can also affect organ function, such as liver metabolism.
Methods: This study investigated the association between chronotype, as measured by the Morningness-Eveningness Questionnaire (MEQ), and indices of non-alcoholic fatty liver disease (NAFLD): the Fatty Liver Index (FLI), the Hepatic Steatosis Index (HSI), and the NAFLD Liver Fat Score (NAFLD-FLS). Data from 917 participants who sought assessment at the IRCCS Istituto Auxologico Italiano between September 2010 and October 2024 were analyzed. Participants underwent clinical history, physical examination, and blood tests relevant to calculating the liver steatosis indices considered in this study.To assess chronotype, each participant completed the 5-item rMEQ, a shortened version of the 19-item questionnaire. The 14-item MEDAS questionnaire was used to assess adherence to the Mediterranean diet. Finally, parameters obtained from physical examinations and blood tests were used to evaluate non-alcoholic fatty liver disease indices.
Results: The sample, predominantly female (71%), had a mean age of 51 years (IQR 41-58) and a BMI indicative of overweight or grade I obesity [28.6 (IQR 25.2-32.6) kg/m^2], with low adherence to the Mediterranean diet (MEDAS score 7, IQR 5,8). In particular, among those with an evening chronotype (11% of the sample), 44% had a BMI ≥ 30 kg/m^2 and approximately half (49.5%) showed a high FLI index, indicative of a high risk of non-alcoholic fatty liver disease, compared to 39.8% of the total sample. Multivariate linear regression models, adjusted for sex, age, BMI, and MEDAS score, showed a statistically significant reduction in the NAFLD-FLS index of 0.04 points (95% CI: -0.09, -0.00) for each 1-point increase in the MEQ score (indicating morningness). When the analysis was limited to individuals with obesity, a reduction in the FLI index of 0.52 points (95% CI: -1.00, -0.04) was also observed for each 1-point increase in the MEQ score.
Conclusion: Evening chronotype is associated with a higher risk of NAFLD, an effect that becomes more pronounced in obesity. Evening chronotype is a non-negligible risk factor for this disease, while being a morning person appears to be protective, controlling lifestyle factors. These data reinforce the hypothesis that evening chronotype is not only a predictor of less healthy habits but is also an independent risk factor for the development of NAFLD. Furthermore, they highlight how chronotype may play a significant role in determining the risk of this condition, especially in those with a higher BMI.

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PO4.257

Adherence to the sustainable *eat-it* dietary model in free-living obese adults: an observational study

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Introduction: Obesity and environmental sustainability are two interconnected global challenges. While the impact of obesity on health is well-known, its link to the environment is less evident. Recent studies highlight how unhealthy diets and unsustainable food systems are at the root of many global problems. The EAT-Lancet diet, a sustainable and healthy dietary pattern, represents a benchmark. This study aims to assess whether the dietary habits of individuals with obesity adhere to the EAT-IT model, the Italian version of EAT-Lancet (Tucci et al, 2022)
Methods: 71 participants with obesity (65% females, 54 (50-64) years, BMI 41,6 (37,9-44,6) kg/m^2 were recruited. Data collected through food frequency questionnaires were analysed and compared with the EAT-IT. The Nutrient Adequacy Ratios (NAR) were calculated to better understand the dietary choices of this population from a food sustainability perspective.
Results: The study revealed a poor adherence of participants' dietary habits to the EAT-IT model. In particular, excessive consumption of red meat (+251%), dairy products (+18%), animal/vegetable fats used for seasoning (+34%), and fresh fruit (+72%) was found, associated with a lower consumption of plant-based foods such as whole cereals (bread -38%, pasta/rice/corn -63%, bread substitutes -78%, and breakfast cereals -100%), legumes (-98%), nuts, and seeds (-100%). However, the high caloric intake emerging from food diaries (median: 2518 Kcal/day; IQR: 2194 - 3240) was found to derive from a higher frequency of consumption of condiments (vegetable oils and animal fats), milk and dairy products, bread, and excessive consumption of processed and ultra-processed foods (packaged bread, canned meat and fish, breakfast cereals, and snacks), excluded from the EAT-IT model due to their high environmental impact. A further significant finding, highlighting the high consumption of processed foods, is the high sodium intake, with a median of 2932 mg (IQR: 2172 mg - 4101). The main criticality in the dietary habits of the subjects analysed is the excessive animal-based proteins intake, which exceeds the recommendations (median: 16%; IQR: 13.53-17.40), as indicated also by the high levels of cholesterol (median: 389 mg; IQR: 295-498 mg).
Conclusion: The findings emphasize the need for dietary changes to address both human health and environmental sustainability. The high consumption of animal-based products and processed foods, which are resource-intensive and contribute to greenhouse gas emissions, but also rich in sodium and unhealthy fats, highlights the importance of promoting plant-based diets. By aligning dietary patterns with the EAT-IT model, it is possible to reduce both the environmental impact of food production and consumption and the burden of diet-related diseases.

Reference

Tucci M, et al. The Environmental Impact of an Italian-Mediterranean Dietary Pattern Based on the EAT-Lancet Reference Diet (EAT-IT). Foods. 2022 Oct 25;11(21):3352. doi: 10.3390/foods11213352.

PO4.258

Long-term Weight Loss Outcomes with Liraglutide in Women of Childbearing Age

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Introduction: Obesity in women of childbearing age is linked to numerous health problems. Weight reduction has been shown to restore ovulation and reduce the risk of both fetal and maternal complications. Therefore, it is routinely recommended for women with obesity who are planning to conceive. Anti-obesity medications are increasingly being used in clinical practice to optimize the health of women with obesity before pregnancy. Liraglutide, an FDA-approved medication for weight management, is contraindicated in pregnancy and lactation and should be stopped in advance, raising concerns about the long-term effectiveness in women of childbearing age who are planning pregnancy. We conducted a study to evaluate long-term weight changes in women of childbearing age with class 3 obesity, comparing those who became pregnant to those who did not.
Methods: This retrospective study investigated women of childbearing age, defined as those aged 18–44 years, with class 3 obesity (BMI ≥40) who were prescribed liraglutide for weight management at the National Obesity Treatment Center between 2017 and 2022 and had at least one follow-up visit beyond six months from their initial visit. The primary outcome was percentage weight reduction from baseline to last documented weight in 2024, The secondary outcome was nadir percentage weight change and medication status in 2024.
Results: A total of 288 women met the inclusion criteria, of whom 41 conceived during the study period, while 247 did not. The mean age of the women who became pregnant was 32.5 ± 6.1 years, compared to 35.0 ± 7.3 years in those who did not (p=0.024). The mean BMI was 44.7 ± 4.7 kg/m2 in the pregnant group and 45.7 ± 6.2 kg/m2 in the non-pregnant group (p=0.267).
Women who conceived had a lower prevalence of MASLD (12.2 vs. 33.6%, p=0.025) and lower mean HbA1c levels (5.6 ± 0.6 % vs. 5.8 ± 1.0 %, p=0.045). Other baseline characteristics were similar between the two groups.
The median nadir percentage weight change was comparable between groups: -8.4% (IQR: -18.3, -1.1) in women who conceived vs. -9.4% (IQR: -21.1, -4.1) in those who did not (p=0.228).
After a mean follow-up of 5 years, 80% of the women who became pregnant were no longer taking anti-obesity medications, compared to 50% of those who did not conceive. The final mean percentage weight change from baseline to the date of data collection was -4.5 ± 14.3% in the pregnant group, compared to -9.1 ± 15.5% in the non-pregnant group (p=0.041).
Conclusion: This study highlights the significant weight reduction achieved in women of childbearing age with class 3 obesity in a real-world setting and the degree of weight regain observed in those who conceived during the study period. This study offers clinically significant insights that have the potential to inform medical practice.

Conflict of Interest: None Disclosed

Funding: No funding to report

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PO4.259

Impacts of Gastric Bypass and Sleeve Gastrectomy on Plasma Levels of Matrix Metalloproteinase-2, -7, and -9 Among Patients with Obesity and Type 2 Diabetes Mellitus

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Introduction: Bariatric surgery is an efficient strategy for body weight and type 2 diabetes mellitus (T2DM) management. Abnormal lipid deposition in visceral organs, especially the pancreas and liver, might cause beta-cell dysfunction and insulin resistance. Extracellular matrix (ECM) remodeling allows adipose expansion, and matrix metalloproteinases (MMPs) play essential roles in ECM construction. MMP-2 and MMP-9 are the substrates of MMP-7. Different studies have reported that MMP-2, -7, and -9 increase in patients with obesity and metabolic syndromes or T2DM, and are considered biomarkers in patients with obesity and hyperglycemia. We prospectively investigated whether MMP-2, MMP-7, and MMP-9 differ after two bariatric surgeries: gastric bypass (GB) and sleeve gastrectomy (SG).
Methods: GB was performed in 23 and SG in 19 patients with obesity and T2DM. The body weight, waist circumference, body mass index (BMI), and serum concentrations of total cholesterol, triglycerides, high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, fasting blood sugar (FBS), hemoglobin A1c (HbA1c), C-peptide, and homeostasis model assessments of insulin resistance were measured. MMP-2, MMP-7, and MMP-9 levels were measured at baseline and at 3, 12, and 24 mo post-operation.
Results: Twenty-three patients aged 44.7 ± 9.7 years underwent GB, and 19 patients aged 40.1 ± 9.1 years underwent SG. In the GB group, BMI decreased from 30.3 ± 3.4 to 24.4 ± 2.4 kg/m2, HbA1c decreased from 9.2% ± 1.5% to 6.7% ± 1.4%, and FBS decreased from 171.6 ± 65.0 mg/dL to 117.7 ± 37.5 mg/dL 2 years post-operation ($P < 0.001$). However, the MMP-2, MMP-7, and MMP-9 levels pre- and post-GB were similar even 2 years post-operation ($P = 0.107$, 0.258, and 0.466, respectively). The SG group revealed similar results: BMI decreased from 36.2 ± 5.1 to 26.9 ± 4.7 kg/m2, HbA1c decreased from 7.9% ± 1.7% to 5.8% ± 0.6%, and FBS decreased from 138.3 ± 55.6 mg/dL to 95.1 ± 3.1 mg/dL ($P < 0.001$). The serum MMP-2, -7, and -9 levels pre- and post-SG were not different ($P = 0.083$, 0.869, and 0.1, respectively).
Conclusion: Improvements in obesity and T2DM induced by bariatric surgery might be the result of MMP-2, -7, or -9 independent pathways.

PO4.260

A randomized weight loss trial on a digital health behavioural change support system: changes in cardiovascular disease risks

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Introduction: Obesity is a risk factor for cardiovascular diseases (CVD). As the prevalence of overweight and obesity increases, it is important to address this trend to reduce the future burden of CVD. The health behaviour change support system (HBCSS) is a web-based application, that utilizes persuasive systems design (PSD) and methods of cognitive behavioural therapy (CBT) to treat patients living with overweight and obesity. The main objective is to determine the impact of HBCSS on the risk of cardiovascular diseases, after the intervention, by using CVD risk calculators.
Methods: In total, 532 participants with overweight or obesity (BMI 27–35 kg m^{-2}) were split into three groups with different intensities of intervention: CBT-based group counselling, self-help guidance (SHG), and usual care. These groups were further divided into HBCSS and non-HBCSS groups. The HBCSS was a 52-week program. In the Finnish healthcare, the risk of previously healthy patients is estimated by using the FINRISK calculator, which is based on Finnish population cohorts. The participants' 10-year CVD risk was assessed with the FINRISK calculator at the end of the HBCSS intervention. In this analysis, the changes were compared between HBCSS and non-HBCSS groups in the participants with obesity. Missing values were replaced with baseline values.
Results: The mean 10-year overall cardiovascular risk at baseline was 3.79% (SD 3.41%) in HBCSS group ($n = 138$) and 3.28% (SD 3.13%) in non-HBCSS group ($n = 140$) with $p = 0.194$ between groups. After one year, for participants with BMI > 30 at baseline, the mean change (percentage points, pp) in 10-year overall risk, was -0.39 (95% CI -0.59 to -0.20, $p < 0.001$) in the HBCSS group ($n = 138$) and -0.15 (95% CI -0.31 to 0.02, $p = 0.086$) in the non-HBCSS group ($n = 140$), with a p-value of 0.059 between groups. For coronary artery disease risk, the mean change (pp) was -0.30 (95% CI -0.46 to -0.14, $p < 0.001$) in the HBCSS group and -0.10 (95% CI -0.23 to 0.03, $p = 0.139$) in the non-HBCSS group, showing a statistically significant difference between groups ($p = 0.050$). For stroke risk, the mean change (pp) was -0.11 (95% CI -0.16 to -0.05, $p < 0.001$) in the HBCSS group and -0.05 (95% CI -0.11 to 0.00, $p = 0.065$) in the non-HBCSS group, with no significant difference between groups ($p = 0.199$).
Conclusion: Among the participants with obesity, in the HBCSS group, the 10-year risks of overall CVD, coronary artery disease, and stroke decreased significantly, while in the controls the change was not significant. For coronary artery disease risk, there was a statistically significant difference between the groups in favour of the HBCSS. In addition to offering a scalable solution for weight loss, our findings suggest that HBCSS may lower the risk of CVD, especially the risk of coronary artery disease, in patients living with obesity.

Conflict of Interest: There is no conflict of interest to disclose.

Funding: The trial was supported by Suorsa Healthcare Foundation and the Finnish Foundation for Cardiovascular Research. This research is connected to the DigiHealth and Fibrobesity projects, supported by the Academy of Finland.

PO4.261

Weight and Body Composition Changes in Response to Liraglutide in Patients with Obesity and Hypothyroidism compared to Patients with Normal Thyroid Function

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Introduction: Obesity is a multifactorial disease that has reached pandemic levels, significantly increasing the risk of cardiovascular diseases and type II diabetes. Various factors contribute to weight gain, including hypothyroidism. Despite appropriate treatment with levothyroxine, many patients with hypothyroidism commonly express their struggles to lose weight despite weight loss interventions; however, there is no evidence to support this. To address this gap, we conducted this study to compare weight and body composition changes in response to liraglutide between patients with with levothyroxine-treated hypothyroidism and a control of patients with normal thyroid disease.
Methods: This retrospective cohort study investigated weight and body composition changes in patients with obesity and levothyroxine-treated hypothyroidism who were initiated on liraglutide at the National Obesity Treatment Center between 2017 and 2022 and had at least one follow-up visit beyond 90 days. A control group of age-, gender-, and body mass

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index (BMI) matched patients were identified. Patients were excluded if they had no follow up beyond 90 days, underwent bariatric surgery during the follow up period, had abnormal TSH levels during the follow up period, or were prescribed alternative treatment.
The primary outcome was the percentage change in weight between the initial visit and the follow-up closest to one year. The secondary outcomes included the proportion of weight loss attributed to fat-free mass (FFM) and the correlation between clinical variables e.g. TSH levels and weight loss outcomes.
Results: A total of 53 patients with levothyroxine-treated hypothyroidism were included and compared to 145 age-, gender-, and BMI-matched controls without thyroid disease. The mean age was 38.8 ± 9.4 vs. 38.7 ± 9.2 (p=0.907), mean BMI of 37.0 ± 4.6 vs. 35.7 ± 4.9 (p=0.088) and mean TSH levels of 2.5 ± 2.1 vs. 2.1 ± 1.1 (p=0.168). There was no significant difference in any of the baseline characteristics between both groups. After a mean follow-up of 10 months, the mean final percent weight change was -10.8 ± 6.5 and -8.9 ± 7.9 (p=0.91) in the levothyroxine-treated group and the euthyroid group, respectively. In addition, the mean final proportion of weight loss from FFM was 29.9 vs. 33.3 (p=0.729). There was no significant correlation between the final weight change and clinical variables including TSH, type 2 diabetes, history of bariatric surgery and use of metformin in univariate and multivariate linear regression.
Conclusion: Our study demonstrated clinically significant weight loss in response to liraglutide among patients with levothyroxine-treated hypothyroidism, comparable in magnitude to those with normal thyroid function. The changes in body composition align with expected changes with weight loss, offering reassurance that the majority of the weight loss is not from fat-free mass—a concern that was observed with levothyroxine initiation in a prior study.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.262

The effects of a two-week hypocaloric meal replacement compared to an established liraglutide therapy on body composition and non-invasive markers of MAFLD before bariatric surgery

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Introduction: Preoperative weight loss can reduce MAFLD-associated liver volume, thereby improving surgical access and minimizing complications in patients with obesity undergoing bariatric surgery. We evaluated the effects of a 2-week hypocaloric diet using meal replacement, which is a standard of preoperative preparation in many bariatric centres, in comparison to an established treatment with a GLP-1-receptor agonist on weight reduction, body composition and features of MAFLD.
Methods: We investigated the effects of a hypocaloric, high-fiber, high-protein diet based on three daily meal replacement products (Hepafast®) compared to a treatment with liraglutide 3.0 mg, which had already been initiated 16 weeks earlier as part of the preparation for bariatric surgery. Primary objective was weight loss. Secondary objectives were the effects on body composition such as fat mass (FM), fat-free mass (FFM), skeletal muscle mass (SMM) and visceral adipose tissue (VAT) as well as non-invasive markers of MAFLD evaluated by FibroScan® parameters (CAP, kPA) and laboratory examination (ELF-, FIB-4-, APRI score). Differences at baseline and after 2 weeks, at the time of bariatric surgery, were compared between both groups.
Results: 49 patients (age 40±11yrs, BMI 44.6±5.6 kg/m², 78% women) were included. At baseline, the liraglutide group had a numerically, but not significantly lower weight (p=0.193), BMI (p=0.206) and waist circumference (p=0.236) compared to the meal replacement group. Mean weight loss after 2 weeks was significantly greater in the meal replacement group (p=0.019).

Tab. 1. Characteristics of study population at baseline and after 2 weeks.

	Meal replacement group			Liraglutide group			
	Baseline	Week 2	p-value	baseline	Week 2	p-value	p-value*
Weight (kg)	*127±23*	*126±23*	*<0.001*	*115±21*	*115±21*	*0.380*	***0.019***
BMI (kg/m²)	*44.1±6.5*	*43.6±6.4*	*<0.001*	*41.2±4.8*	*41.1±4.9*	*0.656*	***0.020***
WC (cm)	*121.4±13.2*	*121.7±14.5*	*0.892*	*116±11*	*117±11*	*0.636*	*0.749*
ALT (U/l)	*28±14*	*32±14*	*0.197*	*34±19*	*30±15*	*0.091*	*0.057*
AST (U/l)	*22±7*	*26±8*	*0.133*	*28±13*	*24±7*	*0.112*	***0.042***
ELF	*8.7 (8.0;9.3)*	*8.8 (8.1;9.2)*	*0.650*	*8.3 (7.9;8.8)*	*8.4 (7.8;8.8)*	*0.584*	*0.906*
FIB4	*0.65 (0.36;0.70)*	*0.74 (0.45;1.01)*	*0.144*	*0.67 (0.39;0.97)*	*0.72 (0.37;0.97)*	*0.593*	*0.229*
APRI	*0.20 (0.15;0.35)*	*0.24 (0.20;0.37)*	*0.116*	*0.22 (0.19;0.42)*	*0.23 (0.20;0.35)*	***0.045***	***0.038***
CAP (dB/m)	*325±43*	*315±49*	*0.278*	*315±48*	*319±61*	*0.156*	*0.409*
TE (kPa)	*5.4(4.3;8.6)*	*6.0(4.3;7.5)*	*0.464*	*6.3(4.4;7.3)*	*5.0(4.6;7.4)*	*0.754*	0.793
FM (kg)	*60.4±13.6*	*59.8±13.8*	*0.099*	*56.4±11.6*	*56.1±11.8*	*0.148*	*0.488*
FFM (kg)	*63.7±10.9*	*62.8±0.5*	*0.069*	*59.2±13.2*	*59.1±13.2*	*0.909*	*0.303*
SMM (kg)	*31.8±5.7*	*31.1±5.6*	***0.005***	*28.9±7.8*	*28.8±7.8*	*0.626*	***0.008***
VAT (l)	*5.4 (4.4;9.0)*	*4.7 (4.0;8.0)*	*0.039*	*4.7 (3.6;6.9)*	*4.7 (3.7;7.7)*	*0.886*	***0.043***

WC – waist circumference; ALT - Alanine transaminase; AST - Aspartate aminotransferase; ELF – Enhanced liver Fibrosis Score; FIB4 – Fibrosis-4-Score; APRI - Aspartate aminotransferase to platelet ratio index Score; CAP - Controlled attenuation parameter; TE – transient elastography; FM – fat mass; FFM – fat-free mass; SMM – skeletal muscle mass; VAT – visceral adipose tissue

*The differences in mean values at baseline and after 2 weeks were compared.

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The reduction in VAT (p=0.043), but also SMM (p=0.008) was significantly greater in the meal replacement group. Improvement in fibrosis as well as steatosis grade measured by FibroScan® was numerically, albeit not significantly greater with meal replacement (p=0.793; p=0.409). 10 patients decided not to undergo bariatric surgery at the end of the study.

Conclusion: After 2 weeks of intervention, weight loss as well as reduction in visceral adipose tissue were significantly greater in the meal replacement group, whereas loss of skeletal muscle mass was less in the liraglutide group. Weight, BMI, waist circumference and fat mass were numerically, but not significantly lower in the liraglutide group at the end of the study.

PO4.263

Influences of Metabolic Surgery on Gut Microbiota and Sera Metabolomics among Patients with Obesity and Type 2 Diabetes Mellitus

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Introduction: Metabolic surgery is a promising treatment for those people with obesity and type 2 diabetes mellitus (T2DM). The changes in the gut microbiota (dysbiosis) and blood metabolomics were demonstrated critical roles in the development of metabolic syndromes and diabetes. We investigated the impacts of gut microbiota and sera metabolites in patients with obesity and T2DM undergoing metabolic surgery before, three, twelve, and twenty-four months after operation.

Methods: After the approval of our ethical committee, those people with obesity and T2DM undergoing metabolic surgery were enrolled in this study. DNA extraction, 16S rDNA-based metagenomics analysis pipeline, and metabolomics analysis were performed before and after surgery. The correlations between clinical indices, and metabolites as well as microbiota, were analyzed by the Pearson correlation.

Results: Body weight, body mass index, total cholesterol, triglyceride, fasting glucose level, C-peptide, HbA1c, HOMA-IR, γ-glutamyltransferase, and des-acyl ghrelin, were significantly reduced two years after metabolic surgery. The overall change in the α diversity indicated a trend of increase after metabolic surgery, while the overall β diversity analysis shown as the PLS-DA components indicated a significant variation before and after metabolic surgery. Significantly decreased levels of branched chain amino acids observed after metabolic surgery. Pathway enrichment analysis indicated that only the glucose-alanine cycle (Cahill cycle) pathway was significantly activated after metabolic surgery. The abundance of *Eubacterium eligens*, *Ruminococcaceae* UCG-003, and *Enterococcus* closely related a total 9 blood metabolites, which were associated with the glucose-alanine cycle activity (Cahill cycle), as well as amelioration of the metabolic syndromes and T2DM.

Conclusion: The changes in the gut microbiota, blood metabolomics, and other disease-related parameters reveal positive effects on the amelioration of metabolic syndromes and diabetes after metabolic surgery.

PO4.264

Impact of Baseline Body Mass Index on Effectiveness and Safety of Telmisartan-Amlodipine Fixed-Dose Combination in Indian Patients with Hypertension: Subgroup analysis of TACT India Real-World Study

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Introduction: Hypertension (HTN) is a prevalent condition and affects 35.5% of adult Indians. The commonly prescribed treatment is telmisartan/amlodipine (T/A) fixed-dose combination (FDC), and yet there is limited evidence on its safety and effectiveness in Indian patients. This subgroup analysis aims to evaluate the effectiveness and safety of T/A FDC in Indian HTN patients as per baseline body mass index (BMI).

Methods: This was a real-world prospective, multicenter, observational study of patients with HTN in India from Sept 2023 to Jun 2024. Adults ≥18 years, of either sex with newly diagnosed HTN (SBP/DBP ≥140/90 mmHg) or inadequately controlled on monotherapy and who were eligible for initiating the T/A FDC were included. The primary endpoint was to assess the change in SBP from baseline to week 8 (end of study – EOS). This subgroup analysis is carried out to understand the treatment effectiveness of T/A FDC as per baseline BMI categories G1 (BMI<25 kg/m2), G2 (25-30 kg/m2) and G3 (>30 kg/m2). Ethics Committee approval and Informed consent were obtained.

Results: A total of 5,363 evaluable patients were analyzed, which included 2,603 in G1, 1,893 in G2, and 867 in G3. The mean (SD) age in G1, G2 and G3 was 57.05 (12.13), 57.06 (12.04), and 56.87 (12.07) years, respectively; and 45.83%, 47.91%, and 45.67%, were males respectively. History of HTN was present in 47.89%, 35.45%, and 16.66% of patients in G1, G2 and G3, respectively; with mean (SD) durations of 5.97 (2.60), 5.9 (2.57) and 6.12 (2.57) years, respectively. The mean (SD) SBP at baseline was 154.96 (6.66) mmHg in G1, 155.33 (6.53) mmHg in G2, and 155.12 (6.71) mmHg in G3. The treatment with T/A FDC, resulted in statistically significant reduction in SBP by 19.16, 19.09, 19.15 mmHg in G1, G2 and G3 groups respectively (P<0.001 for all). Similarly, mean (SD) DBP at baseline was 104.33 (6.83) mmHg in G1, 104.63 (6.51) in G2, and 104.54 (6.71) in G3, resulting in statistically significant reduction in DBP by 15.86, 16.18, 16.17 mmHg in G1, G2 and G3 respectively at the EOS (P<0.001 for all). Target BP of <140/90 mmHg was achieved by 70.53% of patients in G1, 69.15% in G2, and 70.13% in G3. There were 5 reported adverse events (all mild in severity). Majority (>98%) physicians agreed that the T/A FDC was effective and well-tolerated by all groups. All patient groups (>99%) were satisfied with the treatment.

Conclusion: Results demonstrate a significant reduction in BP from baseline across all BMI groups with T/A FDC in Indian patients with hypertension.

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PO4.265

Decoding Unintentional Weight Loss: How the Right Questions Make a Difference

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Introduction: Most malnutrition screening tools include questions about unintentional weight loss [1]. However, when the desire to lose weight is strong, any weight loss may be perceived as a positive outcome, even if it is unintended from a medical point of view. It is unclear whether individuals who intentionally desire to lose weight or perceive themselves as living with overweight or obesity interpret these questions regarding unintentional weight loss accurately [2].
Method: Data from Lifelines [3], a large population-representative cohort of Dutch adults, was used (n~125.000). Prevalence ratios were calculated with unintentional weight loss (question: Have you lost a lot of weight recently without wanting to? (6 kg in 6 months or 3 kg in one month) as the dependent variable. The desire to lose weight (yes/no) and perception of one's body weight (perceiving oneself as too heavy vs. just right or too light) were used as separate independent variables. Associations were stratified by BMI group (individuals with a BMI of <25 kg/m2 vs. ≥25 kg/m2 and adjusted for various diseases, demographics, and quality of life.
Results: In the group of individuals with a BMI <25 kg/m2, 30.3% desired to lose weight, 37.9% rated themselves as too heavy and 5.1% had unintentional weight loss. These percentages were 80.1%, 92.7% and 2.7% in the group of individuals with a BMI ≥25 kg/m2. The prevalence of unintentional weight loss was approximately 60% lower in the group that desired to lose weight (BMI <25 kg/m2: PR: 0.40 (95%CI: 0.36; 0.45), BMI ≥25 kg/m2: 0.42 (95%CI: 0.38; 0.42)) or perceived themselves as too heavy (BMI <25 kg/m2: PR 0.40 (95%CI: 0.36; 0.45), BMI ≥25 kg/m2: 0.43 (95%CI: 0.37; 0.49)).
Conclusion: Since there is no logical/theoretical reason why the desire to lose weight or one's perception of body weight would prevent unintentional weight loss, the differences in prevalence rates are likely due to misinterpretation of questions about unintentional weight loss in these groups. Malnutrition screening tools that use questions regarding unintentional weight loss might underestimate the prevalence rates of malnutrition in populations living with overweight or obesity, as individuals living with overweight or obesity often desire to lose weight or perceive themselves as too heavy.

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PO4.266

Body mass index among individuals with T2DM uncontrolled on monotherapy: Results from an analysis of a pan-India conducted real-world study (NOVELTY)

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Introduction: Obesity is a prevalent comorbidity in individuals with diabetes and has been independently associated with multiple complications of diabetes. Body mass index (BMI) is one of the commonly used methods to identify overweight/ obesity status. NOVELTY was a real-world study that demonstrated effectiveness (in terms of HbA1c reduction) and safety of a novel once-daily formulation of vildagliptin sustained release (XR) 100 mg in adult individuals with type 2 diabetes mellitus (T2DM) uncontrolled on metformin. The objective of the current post-hoc analysis was to stratify the individuals from this study as per their baseline BMI into normal/ overweight/ obesity categories to understand burden of obesity.
Methods: NOVELTY was an observational, prospective, multicenter study conducted in India, which included patients with T2DM uncontrolled on metformin XR monotherapy with HbA1c >7.0%. Vildagliptin XR 100 mg once daily was added to their ongoing treatment and the primary endpoint was change in HbA1c from baseline to 3 months. In the present analysis, BMI levels were identified and categorized as per World Health Organization recommended cut-offs for Asians - normal weight (BMI <23 kg/m2), overweight (23-24.9 kg/m2), obesity (BMI ≥25 kg/m2).
Results: A total of 1691 T2DM patients were enrolled in this study with mean (SD) age 53.1 (11) years, mean (SD) duration of diabetes was 45.64 (51.67) months and mean HbA1c (SD) 8.44 (1.35)%. The mean BMI (SD) of the study participants (n=1686) was 27.57 (5.87) kg/m2. The mean (SD) BMI data was observed to be consistent across the four zones *north 28.20 (5.85), east 26.23 (4.71), west 27.70 (4.56), south 27.67 (7.09) – all in kg/m2*. On stratification, 240 (14.23%) had a BMI in normal range, 323 (19.16%) had a BMI overweight range and 1123 (66.61%) had a BMI in obese range. Further, one-quarter (25.03%) of study participants had BMI≥30 kg/m2. Zonal analysis revealed that the BMI stratification was largely similar across the 4 zones with minor variations when compared with the overall data.
Conclusion: The present analysis revealed that 2 out of 3 T2DM individuals, from India who are relatively in the early stages of diabetes and treated with monotherapy, have comorbid obesity. Thus, weight management needs to be addressed along with glycemic management in most individuals with T2DM during the initial phase of disease.

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PO4.267

Associations between components of primary care dietetic treatment and clinically relevant weight loss in Dutch patients with overweight and obesity

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Background: In the Netherlands, primary care dietitians are the preferred health care professionals for weight management in patients living with overweight and obesity. A clinically relevant weight loss of ≥5% is associated with positive health outcomes. However, a significant proportion of patients fail to achieve ≥5% weight loss.
Objective: This study aimed to identify components in dietetic treatment that are associated with clinically relevant weight loss (≥5%) in patients with overweight and obesity in Dutch primary care.
Methods: In this retrospective study we analyzed data from patients with overweight and obesity in two databases: Health Risk Control (HRC) and 'Diëtetiek Effectief En Toekomstbestendig' (DIEET), covering treatment data from 2016 to 2020. We used multilevel logistic regression to assess associations between patient and treatment characteristics, and ≥5% weight loss upon conclusion of treatment.
Results: Data from 561 patients with overweight and obesity were analyzed. In the DIEET database (n= 383), ≥5 consultations (Odds Ratio (OR) 1.82, 95% Confidence Interval (CI): 1.17-12.80) and >3 hours of consultation (OR 1.57, 95% CI: 1.01-2.42)) were positively associated with ≥5% weight loss after 9 months. Patients on diabetes medication had lower odds of reaching effective/clinically relevant weight loss (OR 0.59, 95% CI: 0.37-0.95) compared to those not on diabetes medication. In the HRC database (n = 178), patients with a primary treatment aim to lose weight had higher odds of effective weight loss (OR 4.36; 95% CI: 1.95-9.74) than those focusing on cardiovascular or diabetes management.
Conclusion: These findings underline the importance of frequent and prolonged dietetic consultations in achieving effective weight loss in primary care settings. Special attention should be given to patients using diabetes medication, as they may require tailored approaches to overcome potential barriers to weight loss.

PO4.268

Gene expression in subcutaneous adipose tissue predicts weight loss response to bariatric surgery

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Introduction: Adipose tissue (AT) undergoes extensive changes during the development and resolution of obesity, impacting its functionality and, consequently, the individual's metabolism. Bariatric surgery (BS) is the most effective treatment for individuals with living with severe obesity; however, there is significant variability in weight loss outcomes. We hypothesized that the functional characteristics of AT, as reflected in its gene expression profile, influence weight loss response to BS and could explain the suboptimal outcomes observed in certain individuals.
Materials-Methods: Gene expression profiling was conducted using microarray hybridization on intraoperative subcutaneous AT samples collected from 22 women aged 25–65 years with a BMI of 39–49 kg/m². The expression levels of these genes were analysed for their correlation with weight loss outcomes one year after BS, and their potential to predict weight loss success was assessed.
Results: The gene expression profiles of patients who lost <30% of their initial weight at one year were significantly different from the rest, with 570 genes downregulated and 538 genes upregulated. Subcutaneous AT from patients with less weight loss showed a significant enrichment in genes involved in adipogenesis, fatty acid metabolism, and oxidative phosphorylation, while hypoxia and TGFβ signalling pathways were downregulated in the same samples.
Conclusions: The gene expression profile of subcutaneous AT prior to BS is associated with weight loss outcomes in response to the procedure. Our data suggest that analysing preoperative samples could predict response to BS, enabling personalized treatment strategies to maximize success probabilities.

Conflict of Interest: None Disclosed

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PO4.269

Rapid Weight Loss Could Increase Bone Fracture Risk

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Introduction: The pathophysiology between bone, muscle, and fat is complex and multifactorial. The risk of bone fracture increases in people living with severe obesity; however, bariatric surgery can exacerbate this risk via rapid weight loss during the first postoperative months. Body mass index (BMI) is directly associated with bone mineral content (BMC); however, muscle correlates with bone microarchitecture, whereas visceral adipose tissue (VAT) is associated with greater bone porosity. Therefore, the effects of bariatric surgery on bone are contradictory but are generally associated with bone loss, increased calcium requirements, and decreased adsorption of calcium and vitamin D. The aim of this study was to measure body composition via dual-energy X-ray absorptiometry (DXA) equipment in persons who underwent bariatric surgery, and to analyze the associations among muscle, VAT, BMC, lumbar spine T-score, and BMI.
Methods: This cross-sectional study analyzed the associations between muscle, VAT, BMC, lumbar spine T-score, and BMI in 65 adults, who were mostly women (n = 54); all participants underwent bariatric surgery in a public hospital in Mexico. The DXA studies were performed with prior informed consent, without calcium intake within 24 hours and without previously used contrast methods.
Results: Visceral adipose tissue was positively associated with age, BMI, percentage of fat, fat mass, and lean mass. Bone mineral content was positively associated with the lumbar spine T-score, and lean mass but not with fat mass; additionally, BMC was negatively associated with age. Although most participants maintained a normal range of lumbar spine T-score, this variable also decreased with age.
Conclusion: Lean mass seems to be associated with better bone quality, which supports the theory that body composition -and not BMI- determines bone health. The accelerated loss of body weight after bariatric surgery could affect bone and therefore increase the risk of osteoporotic fractures, also known as fragility fractures, which are associated with significant morbidity and mortality. The compromised bone strength could persist even after weight regain because of the persistent loss of lean mass. Because obesity is a relapsing chronic disease, long-term obesity treatment should also include the prevention of bone fractures. In long-term obesity care, the complex connections among bone, muscle mass, and body fat, should be considered rather than weight loss or recurrent weight gain. More research is needed to understand the connection between rapid weight loss and bone fracture risk.

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PO4.270

Assessment of the level of knowledge about bariatric surgery among patients suffering from obesity

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Introduction: Obesity is defined by a body mass index (BMI) equal to or greater than 30 kg/m². It increases the risk of developing various chronic diseases, including type 2 diabetes, cardiovascular diseases and cancers.
Bariatric surgery, or obesity surgery, is a procedure designed to treat severe obesity by promoting long-term weight loss. It is intended for patients with a high BMI and obesity-related complications like type 2 diabetes, hypertension, or sleep apnea. The surgery alters the digestive system to limit food intake, reduce nutrient absorption, or both. Common methods include gastric bypass, sleeve gastrectomy, and adjustable gastric banding. While it aids in weight loss and improves many health issues, it requires lifelong adherence to a healthy diet, regular exercise, and medical monitoring. The procedure raises medical, psychological, social, and ethical concerns, making a multidisciplinary approach vital to ensuring its success and enhancing patients' quality of life.
Our study aimed to assess the level of knowledge among patients suffering from obesity about bariatric surgery.
Methods: Our study is descriptive in nature and was conducted with 112 patients suffering from obesity seen in the day hospital or hospitalized in the therapeutic education unit, over a period of two years in the endocrinology department of the Mohammed VI University Hospital Center in Marrakech. It was carried out using a questionnaire that included both open and closed questions about knowledge regarding bariatric surgery.
Results: Among the 112 patients, 56 agreed to complete the questionnaire. The results were as follows: the most affected age group was those over 40 years old, with a percentage of 57.1% and an average age of 49.16 ± 13.3 years. The majority of patients were female, with a male-to-female ratio of 0.03. A total of 33.9% of patients had a primary level of education, and 30.4% had no formal qualifications. The body mass index (BMI) was greater than 40 in 41.1% of cases, followed by severe obesity (BMI 35–40) in 30.4% and moderate obesity (BMI 30–35) in 25%. In our study, 52.2% of patients had no knowledge of bariatric surgery or its types of procedures. Concerns regarding bariatric surgery included weight regain, surgical risks, and post-operative follow-up. Among the obese patients in our study, 98.2% stated that the most reliable sources of information about obesity surgery were doctors and healthcare professionals, as well as the media.
Conclusion: The results of our study highlight a significant lack of knowledge about bariatric surgery among patients with obesity, particularly among female populations, those with low levels of education, and individuals over the age of 40. These findings underscore the critical importance of targeted education and awareness efforts, especially through physicians, healthcare professionals, and media outlets, which remain the most reliable sources of information for these patients. Improving the dissemination of knowledge about bariatric surgery could enhance the management of obesity, address patients' concerns, and promote their adherence to an appropriate therapeutic pathway.

PO4.271

Correlation between obesity severity and dyslipidemia profile

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Introduction: Obesity is a major public health problem. It is a prime source of a constellation of metabolic abnormalities, particularly lipidic, which increase the risk of morbidity and mortality and impair the quality of life of the obese. The aim of our work is to investigate the correlation between the severity of obesity and the profile of dyslipidemia.
Methods: This is a retrospective, descriptive and analytical study, carried out in the endocrinology department of the Mohamed VI university hospital in Marrakech, including patients regardless of age and sex, voluntary and with a Body mass index (BMI) ≥30 kg/m2, divided into three groups according to their BMI (G1: BMI=30-35 kg/m2; G2 BMI=35-40 kg/m2; G3: BMI>40 kg/m2).
Results: The number of patients suffering from obesity in our department over the course of two years is one hundred and twelve. Our study population was predominantly female (98.6%). The mean age was 49,16 ± 13,3 years. sex ratio is 0.03. Mean waist circumference was 168.42 cm. Mean BMI was 41.64 kg/m2.
Seventy-one patients were included in our study. Among our patients, 51.4% were diabetic, 27.8% had hypertension and 20.8% had a history of heart disease. Lipid abnormalities were hypertriglyceridemia, total hypercholesterolemia, hyperLDLmia and hypoHDLmia in 40.3%, 45.8%, 25% and 5.6% respectively. Hypertriglyceridemia and hypercholesterolemia were more frequent in morbid obesity. There was no significant difference between the three groups for hyperLDLemia and hypoHDLemia. There was a statistically significant positive correlation between the severity of obesity and the existence of a lipid abnormality ($p < 0.001$).
Conclusion: The dyslipidemia classically associated with obesity is characterized by a metabolic triad including elevated triglycerides, reduced HDL-cholesterol and excess LDL fraction. Various lipid-lowering therapies, combined with appropriate hygienic-dietary rules, can help improve lipid balance, especially in obese subjects.

PO4.272

Comparison of non-invasive steatosis and fibrosis scores in a population of patients with obesity

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Introduction: Metabolic dysfunction-associated fatty liver disease (MAFLD) diagnosis continues to be through liver biopsy. So, non-invasive strategies have been developed, such as a variety of clinical scores. These scores use clinical and laboratory data to estimate a likelihood of liver steatosis and fibrosis. The aim of this study was to compare a variety of such scores in a population of patients
Methods: Retrospective study through clinical files, collecting demographic, anthropometric, clinical and laboratorial data was performed. The following scores were then calculated: hepatic steatosis index (HIS), NAFLD liver fat score (NAFLD-LFS), Fibrosis-4 (Fib-4), AST-to-platelet ratio index (APRI), NAFLD fibrosis score and BARD score. Correlation with demographic, clinical and ultrasound results was performed.
Results: A total of 50 patients were included, with median age 43 (36-54.3) years old, and 88% female patients The most common comorbidities were osteoarticular (60%), hypertension and diabetes (46% for both) and psychiatric (40%). Median weight was 115 (102-128) kgs with median body mass index (BMI) of 43 (41-46.8) kg/m2 and excess body weight (EBW) of 49 (40-57) %. Steatosis was highly prevalent with 100% according to HSI and 56% according to NAFLD-LFS. This was confirmed by ultrasound,

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with 76% patients exhibiting some signs of liver steatosis. Fibrosis was less prevalent ranging from 0% (APRI) to 67% high risk (BARD), with 11% by Fib-4 and 18% by NAFLD fibrosis score. HSI was correlated with weight, BMI and EBW (p<0.001); NAFLD-LFS correlated with hypertension, dyslipidemia, diabetes and sleep apnea (p=0.012, p<0.001, and p=0.026, respectively); Fib-4 correlated with hypertension and age (p=0.018 and p<0.001, respectively); and NAFLD fibrosis score correlated with BMI and age (p=0.003 and p=0.001, respectively). APRI and BARD did not correlate with any of the assessed variables. None of the scores correlated with results from the abdominal ultrasound.
Conclusion: Liver steatosis seems to be widely prevalent in severely obese patients. However, fibrosis scores show a very high level of discordance, with steatosis prevalences varying significantly.

PO4.273

Body composition of patients with obesity

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Introduction: Obesity is now recognized as a global pandemic, affecting millions of people and constituting a major public health problem. This pathology is characterized by an excessive accumulation of body fat, often associated with metabolic (insulin resistance, type 2 diabetes, etc.), cardiovascular and musculoskeletal (sarcopenia, etc.) complications.
Beyond body mass index (BMI), which remains the most commonly used diagnostic tool, detailed assessment of body composition provides a better understanding of the imbalances between the various body compartments (fat, muscle, bone, water).
Methods: This is a retrospective observational study of patients living with obesity and hospitalized in the Endocrinology and Metabolic Diseases Department of the Mohammed VI University Hospital of Marrakesh. Data were collected from medical records. Body composition assessment was performed by an analyzer using bioelectrical impedance analysis (BIA) technology.
Results: Our center welcomed 112 patients over two years. The average age was 49.1±13.3 years and the sex ratio M/F was 0.03. The average BMI was 41.64 Kg/m2.
Of these 112 patients, 70 were hospitalized and benefited from impedance analysis.
Their mean age was 46.9 ± 14.6 years (14-77 years), with a large female predominance (94.3%). The mean BMI in our series was 45.3 ± 6.9 kg/m2 (30.1-60.5 Kg/m2).
Moderate obesity (BMI between 30.0 and 34.9 kg/m^2) was found in 15 patients, or 21.4%; severe obesity (BMI between 35.0 and 39.9 kg/m^2) in 26 of our patients, or 37.1%; and morbid obesity (BMI over 40 kg/m^2) was noted in 29 cases, or 41.4%.
The mean percentage of body fat mass (%BFM) was 43.8 ± 6.9%.
The mean percentages of lean body mass and body muscle mass (%MM) were 57± 6.3% and 52.5 ± 7% respectively.
Mean percentages of total body water (%TBW) and bone mass (%BM) were 41.1 ± 3.8% and 2.8 ± 0.3% respectively.
The mean basal metabolic rate (BMR) was 1711 ± 230.2 Kcal/day and the mean metabolic age was 61 ± 12.8 years.
Forty-nine patients had a glucose metabolism disorder, i.e. 70% of our series, of whom 47.1% had diabetes and 22.9% pre-diabetes. Fourteen patients had a lipid metabolism disorder, i.e. 20% of our series, of whom 15.7% had pure hypercholesterolemia, 2.9% hypertriglyceridemia and 1.4% mixed dyslipidemia. Twenty two patients had arterial hypertension, i.e. 31.4% of our series.
In our study, linear regression analysis showed that the increase in fat mass percentage correlated statistically significantly with the increase in BMI (p value < 0.001) and the decrease in muscle mass (p value = 0.003).
On the other hand, we found no significant association between BMI or fat mass percentage with the presence of a glucolipid metabolic disorder or hypertension.
Conclusion: Individuals with obesity do not have the same body composition profile nor the same metabolic risks. A detailed analysis of these parameters would not only help to characterize obesity (type and metabolic status), but also to guide therapeutic strategies for tailored and personalized management.

Conflict of Interest: None Disclosed

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PO4.274

Medical Nutrition Therapy Assessment as part of the Multidisciplinary Obesity Staging System

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Introduction: In Ireland, complex obesity care is delivered in Level 3 obesity centres, where assessment is undertaken by a multidisciplinary team (MDT), and a treatment plan put in place. As described previously1, the Multidisciplinary Obesity Staging System (MOSS) was created to score obesity complexity from a broad MDT perspective. The registered dietitians (RDs) have amended the tools they use in medical nutrition therapy (MNT) assessment to encompass 6 key areas and input this data to define obesity complexity from a nutrition perspective, as part of MOSS. Here we describe the baseline MNT assessment data in MOSS in the Centre for Obesity Management in St Columcille's Hospital Dublin.
Methods: This was a retrospective audit of baseline MNT assessment data in the MOSS electronic database from its inception in August 2023 to December 2024. Data were gathered and analysed using Microsoft Excel 2010 (Microsoft, USA) and are presented as mean ± standard deviation.
Results: Complete MNT assessment data were available on 205 individuals (68.2% female, age 46.7 ± 14 years, body mass index 52.4 ± 11.8kg/m2). Across the 6 domains assessed the sources of nutritional complexity were: the presence of biochemical deficiency (74%); poor nutritional intake - meeting some or minimal requirements (50.7%); disordered eating – chaotic pattern, excessive restriction/rigidity, sensory avoidance, loss of control eating or pica (47%); food insecurity (21.5%); Night Eating Syndrome (14.6%); and limited food preparation and planning skills (7.3%). The majority (59.5%) had 1 or 2 sources of nutritional complexity, while 40.5% had 3 or more.
Conclusions: Over half of patients attending this Level 3 obesity centre were found to have more than one domain of nutritional complexity. Assessing nutritional complexity as part of assessment is necessary to guide individualisation and intensification of MNT interventions as part of MDT obesity care. Future work will look at changes in nutritional complexity and MOSS following obesity treatment.

Reference

1O'Malley et al (2024). A pilot study of the Multidisciplinary Obesity Staging System. Obes Facts. 17 (Suppl. 1): 516–586, LBC4.22.

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PO4.275

Effect of bariatric surgery on non-invasive steatosis and fibrosis scores

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Introduction: Metabolic dysfunction-associated fatty liver disease (MAFLD) main treatment is weight loss. Bariatric surgery is recommended for class III obesity and class II with associated comorbidities. The aim of this study was to assess the effect of bariatric surgery and its weight loss on the scores for liver steatosis and fibrosis.
Methods: Retrospective study through clinical files, collecting demographic, anthropometric, clinical and laboratorial data was performed. The following scores were then calculated: hepatic steatosis index (HSI), NAFLD liver fat score (NAFLD-LFS), Fibrosis-4 (Fib-4), AST-to-platelet ratio index (APRI), NAFLD fibrosis score and BARD score, before and one year after bariatric surgery (BS).
Results: A total of 50 patients were included, with median age 43 (36-54.3) years old, and 88% female patients. Steatosis was highly prevalent with 100% according to HSI and 56% according to NAFLD-LFS. Fibrosis was less prevalent ranging from 0% (APRI) to 67% high risk (BARD), with 11% by Fib-4 and 18% by NAFLD fibrosis score. Median weight decreased from 115 (102-128) kgs to 73 (64.5-83) kgs ($p < 0.001$) with body mass index (BMI) reduction of 15.4 (12.6-18.7) and excess body weight (EBW) loss of 64.9 (59.6-70.7) %. Steatosis scores (HSI and NAFLD-LFS) and prevalence decreased significantly ($p < 0.001$) after BS. Fibrosis scores were discordant in estimated prevalence and trend. Fib-4 and BARD showed an increase in advance fibrosis and fibrosis risk ($p<0.001$ and $p=0.029$, respectively); a decrease ($p=0.029$) was demonstrated for NAFLD fibrosis score.
Conclusion: Bariatric surgery is an effective means of weight loss, often associated with a decrease in obesity-associated comorbidities such as MAFLD. This improvement can be observed on non-invasive liver steatosis scores at one-year post-surgery. However, regarding fibrosis scores, the results are conflicting.

PO4.276

Anthropometrics and body composition changes on Obesity management medications -A real-world experience

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Aim: The aim of the study was to evaluate the changes in anthropometrics and body composition on obesity management medications from a multidisciplinary weight management program in a real-world setting.

Methods: This is a cross-sectional study conducted at Genesis Healthcare Centre in Dubai, UAE. 194 patients have been evaluated from October 2022 until November 2023 as part of a multi-disciplinary weight management program. Key demographics, anthropometrics, and clinical data was analyzed using Statistical Package for Social Sciences software version 25 (SPSS Inc., Chicago, IL). Kolmogorov-Smirnov was used to test the normality of continuous variables. The Mann-Whitney test was used to compare the means between two groups if the normality was not confirmed while t-test was used for normal data per groups. A P-value of less than.05 was considered significant in all statistical analysis.
Results: 194 patients included. 152 (78.4%) females and 42 (21.6%) males. The mean age was 42 years (±8.14) with a mean BMI of 32.1 (±5.21) and 34.49 (±6.17) for females and males respectively from 44 different ethnicities.
At baseline, mean waist circumference was 97.81 cm (±9.37) and 109.66 cm (±8.14), waist: hip ratio of 1.69 (±0.15) and 1.56 (± 0.32), skeletal muscle mass was 26.27 kg (±3.83) 39.99 kg (±9.82), fat percent was 44.21% (±5.3) and 35.37 (±7.63), fat mass was 38.85 kg (±10.85) and 35.37 (±7.63), and visceral fat was at level 17.39 (±2.77) and 16.07 (±3.47), for females and males respectively.
At 12 months, (females n=62/152, males n= 17/42), mean waist circumference was 83.9 cm ± (8.73) and 95.09 cm ± (10.83), waist: hip ratio of 1.98 ±0.19and 1.85 ±0.2, skeletal muscle mass was 24.88 kg (±3.88) and 39.08 kg (± 9.86), fat percent was 37.76 % (±6.98) and 28.22% (±7.27), fat mass was 28.64 kg (±10.39) and 26.98 kg (±10.74) and visceral fat was at level 12.95 (± 4.33) and 11.06 (± 5.07), for females and males respectively.
At 6months (n=125) TWL (kg) was 8.92kg (± 6.83), TWL (%) 9.65% (± 6.7) and at 12 months (n=79) 14.33 kg (± 9.76), TWL (%) 15.23% (± 8.86) At 12 months, waist circumference reduced by 56.4 cm (± 55.80) and WHR reduced by 0.77(± 1.02).
In this cohort 75 patients were on Mounjaro, 95 on Semaglutide and 7 patients were on Liragludtide. In Tirzepatide group, TWL % was 11.25% (±7.22) at 6 months and 16.5% (±9.3) at 12 months ($p <0.001$). In Semaglutide group, TWL% was 9.15% (±6.38) at 6 months and 11.76% (±8.79) at 12 months ($p <0.001$).
Conclusion: Weight loss medications resulted in changes in body composition and anthropometrics. There was signification reduction in TWL % and waist circumference at 12 months ($P<0.01$). Tirzepatide showed more TWL% at 12 months than Semaglutide.

Tab. 1. Changes in Anthropometrics at 6 and 12 months.

	At Baseline			After weight loss (6 months)			After weight loss (12 months)		
	Females N=152	Males N=42	All N=194	Females N=94	Males N=31	All N=125	Females N=62	Males N=17	All N=79
weight	86.69± 15.71	108.6 ±24.19	91.43± 19.98	78.94±14.7	98.23 ±22.99	83.72 ± 18.97	74.29 ±14.55	92.42 ±16.12	78.19 ±16.59
BMI	32.1 ±5.21	34.49± 6.17	32.62 ± 5.5	28.85±4.79	30.86 ± 5.38	29.35 ± 5	26.96 ±4.75	29.88 ±4.14	27.59 ±4.76
Waist Circumference	97.81 ± 9.37	109.66 ±8.14	111.94 ± 9.81	88.1±13.28	97.29 ± 7.59	104.93 ± 9.31	83.9 ±8.73	95.09 ±10.83	85.86 ±10
Waist Height ratio	1.69 ± 0.15	1.56 ± 0.32	1.67 ± 0.2	1.87 ±8.39	1.03 ± 0.11	1.7 ± 7.52	1.98 ±0.19	1.85 ±0.2	1.96 ± 0.2
Skeletal Muscle Mass	26.27± 3.83	39.99 ± 9.82	29.23 ± 8	25.37 ±3.58	38.33 ± 7.94	28.56 ± 7.49	24.88±3.88	39.08 ± 9.86	27.79 ±8.01
Fat mass	38.85± 10.85	40.19 ±14.4	39.14 ± 11.68	32.45 ±10.55	31.41 ± 14.26	32.2 ±11.5	28.64 ±10.39	39.08 ± 9.86	28.3 ±10.42
Fat%	44.21±5.3	35.37 ± 7.63	42.29 ± 6.91	40 ±7.78	30.83 ± 8.32	37.78 ± 8.81	37.76 ±6.98	28.22 ±7.27	35.8 ± 7.99
Visceral Fat	17.39 ±2.77	16.07± 3.47	17.1 ± 2.98	14.79 ± 4.15	12.87 ± 5.02	14.32 ± 4.43	12.95 ± 4.33	11.06 ± 5.07	12.56 ± 4.52

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PO4.277

The New Era of Combination Weight Loss Treatments: The Swallowable Gastric Balloon Program and the Anti-Obesity Medication (AOM) Semaglutide

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Introduction: Combination treatment for weight loss is emerging as an effective strategy to enhance efficacy while minimizing side effects. The combination of a swallowable gastric balloon program (SGBP) and anti-obesity medications (AOM) has shown promise in achieving significant weight loss outcomes similar to bariatric surgery.
Aim: The objective of this study was to assess the outcomes of the combined use of the SGBP (Allurion Technologies) and a glucagon-like peptide-1 (GLP-1) receptor agonist AOM.
Methods: A retrospective analysis was conducted on patients with obesity or overweight who were treated during a 10-month period with a combination of the SGBP and semaglutide (Wegovy®, Novo Nordisk). The data were collected from three international, multidisciplinary obesity centers. The patients received a 4-month SGBP, followed by semaglutide for 6 months after balloon excretion. Dosages started at 0.25 mg and increased incrementally up to a maximum of 2.4 mg. All patients were monitored over a 10-month period. Data on weight loss (WL), total body weight loss (TBWL), body mass index loss (BMIL), and adverse events were collected. Additionally, metabolic data were gathered for a subset of patients.
Results: Data were available from 60 patients (73% female) treated with combination therapy. The mean weight and BMI before treatment were 101.4±24.5kg and 36.0±7.0kg/m², respectively. After 4 months of balloon treatment, WL, TBWL, and BMIL were 16.2±6.6kg, 15.9±5.0%, and 5.7±2.1kg/m², respectively. Semaglutide therapy was added after balloon excretion. The reasons for adding semaglutide were unsatisfactory weight loss, a reduction in balloon-induced satiety, and to further enhance weight loss in successful patients. At the end of the treatment with both SGBP and semaglutide at month 10, WL, TBWL, and BMIL were 21.9±8.9kg, 21.2±5.7%, and 7.8±2.9kg/m², respectively. Balloon- and semaglutide-related side effects were similar, and consisted of nausea, vomiting, abdominal cramps, dyspepsia, diarrhea, and constipation, and were managed conservatively with medications. No adverse events necessitated the discontinuation of either the balloon or drug therapy.
Metabolic and waist circumference (WC) data were available from 28 patients (79% female). The mean WC, LDL, TG, and HgbA1c before treatment were 114.9±15.0cm, 140.6±31.8mg/dl, 133.4±56.9mg/dl, and 5.2±0.8%, respectively. After 4 months of balloon treatment, WC, LDL, TG, and HgbA1c reduced by 10.6%, 13.8%, 12.9% (p=0.02), and 7.7%, respectively (p<0.0001, except where noted). At the end of treatment with both SGBP and semaglutide at month 10, WC, LDL, TG (p=0.003), and HgbA1c reduced by 16.2%, 18.6%, 16.9%, and 11.5% from baseline, respectively (p<0.0001, except where noted).
Conclusion: The combination of the SGBP and semaglutide results in greater weight loss compared to either treatment alone, achieving outcomes similar to bariatric surgery. The SGBP demonstrates substantial weight loss and metabolic improvements. Adding semaglutide safely enhances the weight loss and improves metabolic parameters.

Conflict of Interest: Roberta Ienca is a scientific consultant for Allurion

Funding: None

PO4.278

Impact of a Multidisciplinary Lifestyle-based Obesity Management Program on Physical and Mental Health Outcomes in Indian Adults Living with Obesity

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Introduction: Obesity is linked to significant physical, metabolic, and mental health issues such as diabetes, depression, and anxiety. With rising obesity rates in India, there is an urgent need for integrated interventions that address both the physiological and psychological aspects. This study evaluated the impact of a multidisciplinary lifestyle-based obesity management program on physical (weight, BMI, and metabolic parameters) and mental health outcomes (depression and anxiety) in adults with obesity in India.
Methods: This retrospective quasi-experimental study included adults (>18 years) with obesity (BMI ≥25 kg/m²) enrolled in a multidisciplinary obesity management program in India (June 2021–December 2024). The intervention comprised plant-based diet, physical activity, psychological support (group and individual therapy), and medical management. Data on anthropometry, medical history, biochemical parameters, and symptoms of depression and anxiety (via the PHQ-9 and GAD-7) were collected at baseline and after one year.
Results: The study analyzed 925 patients (50.7% female, mean age 51.4 ± 9.9 years), of whom 859 had diabetes (mean duration: 8.4 ± 7.9 years). Baseline weight, BMI, and HbA1c levels were 80.8 ± 13.8 kg, 29.8 ± 4.1 kg/m², and 7.9 ± 1.7%, respectively. Obesity Class I (BMI 25–29.9 kg/m²) comprised 62.9%, while 37.1% had Class II obesity (BMI ≥30 kg/m²). Post-intervention, significant improvements were observed. Weight and BMI: Mean weight decreased from 80.8 to 74.1 kg, and BMI from 29.8 to 27.3 kg/m² ($p < 0.001$, d=1.2). Diabetes metrics (N=859): HbA1c dropped from 7.9% to 6.7% (d=0.7), fasting glucose from 138.5 to 122.8 mg/dL (d=0.3), and postprandial glucose from 170.4 to 146.2 mg/dL (d=0.3) ($p < 0.05$). Mental health: The prevalence of depression and anxiety decreased from 49.7% at baseline to 30.8% and 45.4% at baseline to 32.6%, respectively. Patients with Class II obesity experienced significantly higher mental health improvements than those with Class I obesity, with reductions seen in both symptoms of depression (mean PHQ-9 score difference: 2.4 vs. 1.6; $p < 0.001$) and anxiety (mean GAD-7 score difference: 1.8 vs. 1.2; $p < 0.05$), indicating a strong correlation between obesity severity and mental health outcomes.
Conclusion: A multidisciplinary program significantly improved physical and mental health outcomes, with the greatest benefits observed in the higher obesity classes. This study underscores the importance of multidisciplinary lifestyle interventions in addressing both the physical and psychological dimensions of obesity.

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PO4.279

Obesity and urinary incontinence: prevalence, severity and quality of life using urogenital distress inventory short form (UDI-6) and incontinence impact questionnaire short form (IIQ-7)

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Introduction: Urinary incontinence (UI) is a relatively common condition in middle-aged and older women it refers to the involuntary leakage of urine, and it is a common condition that can significantly affect the quality of life. There is a well-established link between obesity and urinary incontinence, with research suggesting that individuals who are obese are at a higher risk of developing this condition.

The incidence of obesity is growing at an alarming rate worldwide. In Morocco, The prevalence of obesity has increased among Moroccan population over the past 15 years. The high prevalence of obesity has been attributed to various factors including demographic, lifestyle, economic and psychosocial.

The relationship between the two is multifactorial, involving several mechanisms: Increased pressure on the pelvic floor, changes in bladder function, hormonal and metabolic factors, reduced physical activity, inflammatory factors, postural changes.

The purpose of our study was to examine the prevalence, quality of life (QoL) and severity of urinary incontinence in participants with obesity.

Methods: This cross-sectional study included 112 patients who were admitted in the Endocrinology and Metabolic Diseases Department of the Mohammed VI University Hospital of Marrakesh in two years. The patients were contacted by phone, and 75 of them agreed to complete the survey. We used the Urogenital Distress Inventory short form (UDI-6) and Incontinence Impact Questionnaire short form (IIQ-7) after the Arabic translation and cultural adaptation. The two short forms are used to diagnose individuals with urinary incontinence and to assess the impact of the dysfunction on patient quality of life.

Results: The mean age of the participants in our series was 46.9 ± 14.6 years (14-77 years), with a large female predominance (94.3%). The mean BMI in our series was 45.3 ± 6.9 kg/m2 (30.1-60.5 Kg/m2). The overall prevalence of UI was 64.2%, 52.1% of those patients had mild to very severe UI. Overweight and obesity was significantly associated with poor QoL in women with UI. The fully adjusted models show linear associations between BMI, and UI.

Conclusion: Obesity is strongly associated with an increased prevalence of UI. Overweight and obesity are important risk factor of UI affecting daily activity and QoL. Both weight reduction programs and bariatric surgery can result in amelioration of UI. The degree of weight loss is positively correlated with improvement in symptoms. Weight loss should consider as first line treatment for this patients population.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.280

Exceptional Outcomes and Safety Profile in the First 2,000 Patients Treated with the Allurion Balloon Program at a Single Spanish Bariatric Center

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Background: Since 2017, our bariatric center in Spain has integrated the Allurion Balloon Program into a multidisciplinary weight loss approach. This program complements our offerings, which span dietary counseling to bariatric surgery. This abstract summarizes the outcomes and safety profile of our first 2,000 patients treated with the Allurion Balloon, highlighting its effectiveness and minimal complications in a comprehensive weight management setting.

Methods: A retrospective analysis of 2,000 patients treated with the Allurion Balloon between 2017 and 2024 was conducted. All patients participated in a structured program that included dietary guidance, medical supervision, and psychological support. Weight loss outcomes were assessed through total weight loss (TWL%), excess weight loss (EWL%), Fat Mass% and Muscle Mass% at four and six months. Safety was evaluated by the incidence of adverse events and complications requiring medical, endoscopical or surgical intervention.

Results: The mean TWL% at 4 months was 12.36% ± 7.39%, and EWL% reached 43.47% ± 28.72% At 6 months, patients maintained significant weight loss with improved metabolic markers, including reductions in HbA1c and lipid profiles. Fat mass reduced of 7.8% while muscle mass increased 9.8% at 6 months. The program demonstrated a remarkably low complication rate (<0.96%), with only a few cases requiring early balloon removal due to intolerance (0.9%). No severe adverse events or mortality were reported. The integration of the Allurion Balloon into our multidisciplinary approach has enhanced patient access to effective non-invasive weight loss solutions, bridging the gap between dietary management and bariatric surgery.

Conclusions: The Allurion Balloon Program has proven to be a safe, effective, and scalable intervention in our bariatric center. These results underscore its value in comprehensive obesity management, offering significant weight loss with a minimal complication rate. As one of the largest single-center experiences in Europe, this study supports the Allurion Balloon as a cornerstone in the continuum of care for patients with obesity.

PO4.281

"Correlation Between Serum Uric Acid Levels and Estimated Glomerular Filtration Rate in Patients Suffering From Obesity"

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Introduction: The burden of obesity has been growing steadily for the past 2 decades, more so in developing than in rich countries. On a worldwide scale, the number of patients suffering from obesity will exceed one billion by 2022 (1). Uric acid (UA) is the end product of purine metabolism, and its elevation is responsible for systemic hyperuricemia characterized by precipitation of urate crystals in soft tissues such as the kidney and joints (2). According to several studies, it is an independent risk factor for the onset or progression of renal and/or cardiovascular disease, especially in at-risk populations such as patients suffering from obesity, knowing that those patients present often high uric acid (HUA) (3).

The aim of this study is to evaluate the correlation between uric acid (UA) levels and estimated glomerular fltration rate (eGFR) in patients with obesity (OB).

Materials-Methods: Data were collected from physical files and computerized system for patients suffering from obesity follow-ups in our department (descreptive study over a period of 12 months). Exclusion criteria: patients without uric acid and/or creatinine measurement.

Results: The total number of our patients was 112, the average age of our patients was 49,16 ± 13,3 years. The sex ratio was 0,03 (108 W/ 04 M). BMI was between (31,1 and 60,5 kg/m2) with an average of 41,64 kg/m2. Forty-six percent (46%) of our patients are suffering from diabetes with an average of age of diabetes by 7,8 years ± 6,61 years. Thirty-eight percent (38%) of our patients are suffering from hypertension. Patients with metabolic syndrome (MetS) represente 46,0 %. The proportion of patients with HUA was 23 % with an average of 66,78 mg/l in women and 81 mg/l in men. The average of Plasma creatinine was 6,88 ± 2,42 mg/l and the average of eGFR was 117,27± 26,42 ml/min/1,73m2. Total patients with ReGFR was 17,7 %. Proportion of patients with association [HUA-ReGFR] was 8,8 %. In diabetic and hypertensive group, it was 4,4 %. Proportion of patients with the association [HUA-MetS] was 15 %. Uricemia was inversely correlated with eGFR (r = -0.20).

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Discussion and Conclusion: Several human experimental studies suggest a pathogenic role for uric acid in the deterioration of renal function, despite the fact that it is sometimes difficult to establish a clear victim-culpable relationship between hyperuricemia and nephropathy. Hyperuricemia alters glomerular filtration by tubular precipitation of free uric acid crystals in the collecting tubes and renal medulla, by the formation of uratic lithiasis or by deposition of sodium urates in the renal meddula (4). Patients suffering from obesity represent a group at increased risk of uric lithiasis, possibly related to an acidic urinary pH (5,6) and increased uric acid excretion (7). The majority of people with obesity have metabolic syndrome, frequently associated with gout favoring elevated uricemia due to insulin resistance (8).

Conflict of Interest: The authors declare that they have no direct or indirect interest (financial or in kind) in any private, industrial or commercial organization related to the presented subject.

PO4.282

Can isolated low folic acid levels lead to polyneuropathy following bariatric surgery? Case-control study

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Objective: Obesity is a well-established risk factor for various health disorders, and bariatric surgery (BS) is recognized as the most effective intervention for severe obesity, offering substantial weight loss and improvement in obesity-related comorbidities. However, BS can also lead to nutritional deficiencies, including folic acid deficiency, which may contribute to polyneuropathy and neurological impairments
Aim: We want to know if polyneuropathy after bariatric surgery is caused by folic acid deficiency.
Methods: A 51-year-old male diagnosed with metabolic syndrome and obesity class III (BMI 45 kg/m2) underwent bariatric surgery. Preoperative assessments revealed normal folic acid levels, while the patient had comorbidities including dyslipidemia and hypertension. Postoperative weight loss and improvement in metabolic parameters were observed, but the patient developed leg weakness, paresthesia, and difficulty moving by the third month after surgery. Neuropathy testing showed minor axonal sensory polyneuropathy, and folic acid levels were found to be deficient. Oral folic acid supplementation was initiated.
Results: Following surgery, the patient began to lose weight, and his parameters improved. Antihypertensive treatment was also discontinued. The following results were obtained during the postoperative evaluation at month three: He began to feel growing weakness in her legs with paresthesia and was unable to move. He mentioned periodically discontinuing his vitamin supplements. His neuropathic test scores and tests were both weakly positive; Sudoscan revealed moderate neuropathy, and electromyography revealed minor axonal sensory polyneuropathy in his legs. Testing of the cerebrospinal fluid revealed no abnormalities. Laboratory results: HbA1c 5.7%, BMI 38.1 kg/m2, T/A 120/70 mmHg, and all vitamins and minerals in the normal range. The folate level was 3.2 nmol/l (>8.8). Treatment: nutritional therapy, physical exercise, calcium citrate, vitamins D and B12 continued with multivitamins, oral folic acid 5 mg/day, vitamin B1 100 mg/day. After 9 months: HbA1c 5.4%, BMI 30 kg/m2, T/A 125/70 mmHg. The patient's status was satisfactory, with improved PN symptoms and sustained weight loss. The neuropathy tests, vitamins, and minerals were within the normal range. One-year post-surgery: HbA1c 5.4%, BMI 28.8 kg/m2, T/A 125/70 mmHg. The patient's general status was acceptable, and no PN symptoms were observed. Weight loss has ceased over the past month, leading up to the exams. The neuropathy tests and Sudoscan are in normal ranges. Vitamin D, B1, folic acid, calcium, and B12 levels were normal.
Conclusion: This case highlights the importance of monitoring and addressing folic acid deficiency after bariatric surgery. Folic acid supplementation effectively reversed symptoms of polyneuropathy and supported continued weight loss and improvement in comorbid conditions. The findings suggest that folic acid deficiency may contribute to post-surgery polyneuropathy, emphasizing the need for adequate nutritional monitoring and supplementation post-BS.

PO4.284

Real world data from digital delivery of the Counterweight Programmes combined with Tirzepatide: early service evaluation insights

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Introduction: Obesity therapeutics are evolving with the integration of digital technologies and advanced weight loss medications. Building on the NICE early value assessment for digital weight-management technologies, this evaluation provides real-world evidence on combining Tirzepatide with a structured weight management programme.
Methods: The service offers Tirzepatide for weight management and patient choice of either Counterweight-Plus (Total Diet Replacement) or Counterweight-Programme (calorie controlled low-fat or low-carbohydrate). Patients were opportunistically approached by GPs in primary care (Queens Road Medical Practice, Guernsey) and attended a GP-led introductory session. Patients undergo screening and agree to pay for the 12-month programme delivered by trained nurses and GPs over 18 appointments (including medication reviews), provision of the Counterweight digital app and anonymised data collected for evaluation. Eligibility criteria: adults >18years, Body Mass Index (BMI) ≥30kg/m2 or ≥27 kg/m2 with ≥1 weight related condition (adjusted for ethnicity), engaged with a Counterweight-Programme, no contraindications for Tirzepitide or a weight-loss programme and the ability to self fund the programme.
Results: Between 01/07/2024 and 01/01/2025 302 patients were opportunistically approached by the primary care team. One-hundred and nine, (36%) attended the information session, and 62(57%) joined the service, all of whom received Tirzepatide and 22(35%) enrolled in Counterweight-Plus and 40,(65%) Counterweight-Programme. Reasons for not signing up to the service were not routinely collected. By 01/01/2025 29 patients (Counterweight-Programme n= 16(55%) and Counterweight-Plus n=13(45%) had been in the service for ≥3-months, thus qualifying for the evaluation and 26(90%) completed the programme and 3(10%) withdrew (Counterweight-Plus: 1=adverse event cholecystitis, 1=moved away, Counterweight-Programme: 1=financial). Median(IQR) baseline characteristics were: age 53(18)years, weight 105(32)kg, BMI 38(8.9)kg/m², 23(79%) were female. At 3-months data for 27 starters was available for analysis. Participants attended a median(IQR) of 8(3) appointments. Median(IQR) weight change was -13.4(4.0)%, with 7(26%) achieving weight-losses of <10%, and 20(74%) ≥10%. Median(IQR) weight-losses did not differ between those receiving Counterweight-Plus or Counterweight-Programme, -14.0(6.7)% and -13.5(3.3)% respectively. At 3-months patients receiving Counterweight-Plus were prescribed Tirzepatide doses 5mg = 6(50%), 7.5mg=3(25%) and 10mg=3(25%) and those receiving Counterweight-Programme doses 5mg=10(67%), 7.5mg=4(27%), 10mg=1(6%). During the 3-month period 12(41%) of patients reported no side effects and 17(59%) reported ≥1 side effects. Both programmes showed similar side effects, including constipation, nausea, bloating, diarrhea, and vomiting, with no withdrawals due to these effects.
Conclusion: Our service evaluation demonstrated that combining Tirzepatide with patient choice of structured weight management programme in primary care resulted in two thirds of patients achieving ≥10% weight-loss at 3-months, at lower doses of Tirzepatide.

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PO4.285

Observational Study on a Weight-Loss Program Combining Auricular Acupoint Stimulation and Nutritional Supplements for Improving Eating Behaviors and BMI

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Introduction: Obesity is a global health issue. In Japan, a weight-loss program that integrates auricular acupoint stimulation with nutritional supplements has been practiced for over three decades, reportedly achieving a reduction of approximately 10 kg within three months and minimal rebound, thereby suggesting its effectiveness. The present study aimed to investigate the factors contributing to the program's long-term weight-loss outcomes by focusing on changes in eating behaviors as measured by the Dutch Eating Behavior Questionnaire (DEBQ).

Methods: In this observational study, 49 Japanese women aged 28–71 years participated in a three-month program combining auricular acupoint stimulation (non-invasive metal beads placed on six ear acupoints bilaterally) and nutritional supplementation. Participants were instructed to reduce their usual food intake by about half while taking supplements to prevent nutritional deficiencies. Eating behaviors, including restrained, emotional, and external eating, were evaluated before and after the program using the DEBQ, with age and BMI included as covariates. Body composition was measured at both time points, and a mixed-effects model (5% significance level) was employed for statistical analysis. Additionally, a subgroup analysis categorized by the magnitude of BMI reduction at the end of the program was performed to examine associations with changes in BMI.

Results: Following the program, the mean BMI (standard error) decreased by -2.70 (±0.83). Restrained eating (baseline mean: 2.96) increased by 1.19 (±0.12), while emotional eating (2.36) and external eating (3.45) decreased by -0.66 (±0.12) and -1.06 (±0.11), respectively; all changes were statistically significant ($p<0.01$). Furthermore, a subgroup analysis based on high versus low BMI reduction at three months revealed that participants with greater BMI decreases exhibited more pronounced improvements in eating behaviors ($p<0.01$).

Conclusion: The weight-loss program integrating auricular acupoint stimulation with nutritional supplements produced significant improvements in restrained, emotional, and external eating behaviors. Notably, larger DEBQ score changes were associated with greater reductions in BMI. These findings suggest that this program may serve as a valuable long-term strategy for obesity treatment by modifying eating behaviors.

Tab. 1. Improvement Effects on Each DEBQ Subscale.

DEBQ Subscale	Model	Estimate	SE	p-value
Restrained eating	Unadjusted	1.25	0.12	<0.01
	Adjusted model*	1.19	0.12	<0.01
Emotional eating	Unadjusted	-0.69	0.11	<0.01
	Adjusted model*	-0.66	0.12	<0.01
External eating	Unadjusted	-1.04	0.11	<0.01
	Adjusted model*	-1.06	0.11	<0.01

*Adjusted model = Adjusted for age and BMI SE = Standard Error

Tab. 2. Improvement Effects of DEBQ Scores by BMI Reduction Groups.

DEBQ Subscals		Model	Estimate	SE	p-value
Restrained Eating					
	Small BMI Reduction (n=26)				
		Unadjusted	1.09	0.15	<0.01
		Adjusted model*	1.00	0.16	<0.01
	Large BMI Reduction (n=23)				
		Unadjusted	1.44	0.18	<0.01
		Adjusted model*	1.32	0.19	<0.01
Emotional Eating					
	Small BMI Reduction (n=26)				
		Unadjusted	-0.60	0.14	<0.01
		Adjusted model*	-0.41	0.14	<0.01
	Large BMI Reduction (n=23)				
		Unadjusted	-0.78	0.18	<0.01
		Adjusted model*	-0.91	0.20	<0.01
External Eating					
	Small BMI Reduction (n=26				
		Unadjusted	-0.85	0.13	<0.01
		Adjusted model*	-0.83	0.14	<0.01
	Large BMI Reduction (n=23)				
		Unadjusted	-1.25	0.16	<0.01
		Adjusted model*	-1.39	0.18	<0.01

*Adjusted model = Adjusted for age and BMI SE = Standard Error

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PO4.286

Effects of semaglutide among patients with psoriasis and obesity

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Introduction: There is a bidirectional relationship between obesity and psoriasis, with their primary common etiopathogenic basis being a chronic low-grade inflammation. The presence of obesity in patients with psoriasis worsens plaques, reduces the efficacy of biological treatments, and increases cardiovascular risk, which is the leading cause of morbidity and mortality in these patients. In a previous study, we observed that treatment with liraglutide not only improved metabolic variables but also dermatological parameters, independently of weight loss.
Objective: To assess the effect of treatment with semaglutide in patients with psoriasis and obesity.
Methods: A total of 41 patients (56.1% ♀, 45.9 ± 15 years, psoriasis duration 18.2 ± 11.6 years) started treatment with semaglutide. The severity of the lesions was evaluated using the PASI (Psoriasis Area Severity Index), VAS (Visual Analogue Scale of Pain), and DLQI (Dermatology Quality of Life Index), and mood was assessed with the Beck Depression Inventory (BDI). Metabolic parameters were determined at baseline and after 3 months.
Results: At 3 months, there was a significant reduction in BMI (38.7±6.4 vs. 34.1±5.9kg/m2; p<0.001), waist circumference (113.8±12.7 vs. 105.6±10.7cm; p<0.001) and preperitoneal fat (2±0.9 vs. 1.4±0.8cm; p<0.0001). There was a significant amelioration of PASI (11.3±7.1 vs 5.5±5.1; p<0.0001), VAS (5±1.7 vs 2.3 ±1.2; p<0.0001) and DLQI (12.3±7.4 vs 5±4.2, p<0.0001). Regarding metabolic and inflammatory markers, there was a significant reduction in HbA1c (5.6±0.5 vs. 5.4±0.6%; p<0.0001), insulin (21.5±13.9 vs 14.8±12.3µIU/mL; p<0.001), ultrasensitive CRP (3.8±2.6 vs 1.9±2.2mg/L; p<0.0001), ferritin (171.3±119.5 vs 120.9 ±115.5ng/mL; p=0.04) and plasma cortisol (13±3.9 vs 11.2±2µg/dL, p=0.008). Depressive symptomatology was significantly reduced (15.1±5.1 vs 9.4±3.1; p<0.0001). In multiple regression analysis, weight loss did not correlate with any inflammatory parameter or PASI. There were no treatment discontinuations due to adverse effects.
Conclusions: Semaglutide is effective and safe in patients with psoriasis and obesity. There could be an anti-inflammatory effect that improves psoriatic lesions regardless of weight loss.

PO4.287

Real-world data on the efficacy of oral vs subcutaneous semaglutide on anthropometric and body composition parameters in patients with obesity

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Introduction: Obesity is a chronic and relapsing disease with limited pharmacological options until recent years. The introduction of liraglutide marked a turning point in the management and outcomes of patients with obesity. In Spain, during the liraglutide shortage, semaglutide, both oral and subcutaneous, was used as an off-label indication to continue the treatment of these patients. Although higher doses of oral semaglutide are being studied beyond those used in diabetes for the potential management of obesity, it remains unclear whether both formulations are equally effective.
Objectives: To compare oral and subcutaneous semaglutide in a sample of patients with obesity matched by age and BMI.
Methods: 50 patients with obesity treated with oral semaglutide (76% women, age 53.1±13.5 years, BMI 30.6±2.4kg/m², average semaglutide dose 12.5±2.9mg/day) were compared to 50 patients treated with subcutaneous semaglutide (85.7% women, age 49.6±11.5 years, BMI 30.6±2.3kg/m², average semaglutide dose 0.9±0.5mg/week) over a 4-month period. Baseline and 4-month anthropometric and body composition data were collected.
Results: Baseline BMI and body composition parameters were comparable between groups. No significant differences were found in final BMI (28.8±2.3 vs. 29.2±3.9kg/m²; p=0.7), weight loss in kg (7±4.4 vs. 5±5.3kg; p=0.2), or percentage of weight loss (9.8±6.8 vs. 6.5±7.3%; p=0.1). Similarly, lean mass loss (0.5±2.3 vs. 0.8±1.7kg; p=0.5) and final dynamometry (25.9±5.2 vs. 23.6±3.6kg; p=0.2) were comparable. However, fat mass los,both in percentage (4.7±7.8% vs. 1.4±2.3%; p=0.04) and in kg (6.2±6.9 vs. 2.6±4.2kg; p=0.04), as well as waist circumference reduction (6.1±5.1 vs. 2.7±2.5cm; p=0.006) and visceral fat reduction index (2.9±2.3 vs. 1.3±1.8; p=0.009), were significantly greater in the subcutaneous semaglutide group. Adverse event were comparable between groups.
Conclusions: Although overall weight reduction was comparable between the two semaglutide formulations, the subcutaneous regimen achieved significantly greater improvements in visceral fat and waist circumference—key factors in reducing the increased cardiovascular risk of patients with obesity.

PO4.288

Metabolically healthy obesity - mith or reality

Sipos, E. E.; Simonyi, G.

Anyagcsere Központ, Szent Imre Egyetemi Oktatókórház, Dél-budai CentrumKórház

Obesity is a chronic, progressive disease that is associated with an increased accumulation of fat in the body. As a result, it requires lifelong treatment. The mainstays of treatment for overweight patients are: lifestyle therapy (diet and exercise), psychological guidance, drug therapy, and bariatric interventions.
Obesity can be divided into subtypes, phenotypes or even categories (classification). All of these not only promote understanding, the underlying diseases, treatment, but also prevention.
It is a known fact that both overweight and obesity are associated with an increase in mortality and morbidity. Obesity affects the development of more than 229 diseases as we know now.
However, when examining the patients, a new group possibility arose that includes overweight patients who do not have accompanying diseases. Or is it really so?
This is how the concept of metabolically healthy obesity was born. However, we do not currently have a clear definition. The most widely accepted definition is a BMI value above 30 kg/m², which is not associated with metabolic and cardiovascular diseases. What these comorbidities could be? For example, it could be hypertension, diabetes, hyperlipidaemia, NASH/NAFLD, atherosclerosis, cardiovascular diseases and so on.
When should we intervene? How do we help our patients the most?
I would like to briefly review this border area with the help of my poster.
The poster is not intended to take a position on the concept of metabolically healthy obesity.

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PO4.289

The impact of steering fiber fermentation toward the distal colon on circulating immune cell populations in individuals with overweight/obesity: a 12-week randomized controlled trial (DISTAL study)

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Introduction: Obesity is characterized by chronic low-grade inflammation, which may be linked to metabolic dysfunction. Dietary fibers have the potential to alleviate obesity-associated disruptions in the microbiota-immune axis though short chain fatty acids (SCFA) production. Previous studies have demonstrated that SCFA production in the distal colon can lead to beneficial metabolic health outcomes. However, as fibers are broken down throughout the colon, protein fermentation increases, resulting in a variety of metabolites, including ammonia and p-cresol, which are often associated with negative metabolic health effects. Therefore, dietary fibers that undergo fermentation more distally in the gut may enhance beneficial metabolite production, thereby positively influencing the immune system and metabolic health. The objective of this study was to investigate the effect of a potato-fiber/pectin mixture, shown to ferment distally in *in vitro* fermentation experiments, on circulating immune cells in individuals with obesity.
Methods: Individuals with overweight/obesity and at risk for developing type 2 diabetes were provided an eucaloric high protein diet (25%E, 45% plant-based) to increase colonic protein fermentation. Participants were randomly assigned to receive 15 grams of potato-fiber/pectin mixture (n=17) or an isocaloric placebo (maltodextrin) (n=20) daily for 12 weeks. Inflammatory markers were assessed and flow cytometry was used to analyze changes in the abundance of different circulating immune cells including monocyte, NK-, B-, and T-cell subsets at baseline, 6, and 12 weeks.
Results: Circulating leucocytes (p=0.053) and interleukin 6 (IL-6) (p=0.070) tended to differ between groups over time, increasing in the fiber group while decreasing in the placebo group after 12 weeks. Similarly, granulocytes increased after fiber intervention while they decreased in the placebo group (p=0.016). The change in granulocytes positively correlated with a change in IL-6 (Δ week 0-12, p=0.018), and a change in lipopolysaccharide binding protein (Δ week 0-6, p=<0.001) in the total group. Additionally, fiber supplementation attenuated the increase in natural killer T (NKT) cells observed in the placebo group (p=0.046), which was mainly due to an increase in $CD8^{-}CD4^{-}$NKT cells after 6 weeks of intervention (p=0.001). Independent of intervention, Th1:Th2 ratio decreased over time (time, p=0.009), with no significant difference between groups.
Conclusion: Adding a fiber mixture to a high protein diet to steer distal fermentation resulted in increased granulocytes, which was linked to an IL-6 increase, and attenuated the increase in NKT cells observed in the placebo group. Interestingly, the high (plant-based) protein diet reduced Th1:Th2 ratio, independent of fiber addition, suggesting reduced inflammation. Further analyses are needed to determine whether these changes are associated with microbial metabolites, including SCFA and whether they impact metabolic health and glucose homeostasis.

Conflict of Interest: None Disclosed

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PO4.290

Real-World Experience with subcutaneous Semaglutide in patients with obesity. Insights from a Tertiary Care Hospital

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Introduction: Obesity, a global pandemic; has been revolutionized by innovative GLP-1 RAs treatments such as subcutaneous-Semaglutide (SC-Sema). STEP trials showed a ≈14.9% weight loss in patients with obesity (PwO), but, can these results translate to real-world outcomes?
Methods: Our objective was to examine the prescriptions of SC-Sema (Wegovy®) in PwO, from its launch until December 13th, 2024. Subsequent follow-up if available was also recorded. Switches were defined as continuous use of prior obesity medication (ObMed) within one month of starting SC-Sema (EXPERIENCED-COHORT); otherwise, it was considered a new prescription (NAÏVE COHORT).
Results: A total of 1302 prescriptions of SC-Sema to treat obesity were identified, 72 were excluded due to missing data. The NAÏVE-COHORT included 1006 PwO, 74.9% were women and age was (mean±SD) 51.9±13.1years (P25-P75: 44-62). Comorbidities included diabetes (10.3%), prediabetes (18.4%), hypertension (35.6%), dyslipidemia (39.4%), sleep apnea (10.0%), osteoarthritis (18.2%), hepatic steatosis (15.4%) and prior bariatric surgery (5.4%). BMI distribution was: 27-30 (13.8%), 30-35 (40.0%), 35-40 (26.6%), 40-50 (12.5%) and >50 (2.6%). Follow-up was available in 243 PwO, weight loss was -8,3±5.3kg (CI95%: -7.6 to -9.0), -8.3±5.3%, reaching a mean dose of 0,98±0.53mg and with 4.7±1.82 mo. of follow-up. Weight loss with 0.25mg dose (n=19, BMI 35.2) was -2.9±2.6% and at a rate of -0.7±0.7 kg/mo, with 0.5mg (n=56, BMI 35.2) was -7.17±4.5% and -1.9±1.6 kg/mo, with 1.0mg (n=130, BMI 35.9) was -9.0±5.2% and -2.3±3.2 kg/mo, with 1.7mg (n=21, BMI 36.3) was -9.0±5.6% and -2.0±1.6 kg/mo, while in those with 2.4mg (n=17, BMI 40.1) was -11.2±5.8% and -2.7±2.6 kg/mo. Treatment was discontinued in 22 PwO (9.1%, for AEs). Multiple regression analysis revealed that dose (β -3.1), prediabetes (β +2.1), hepatic steatosis (β +3.1), BMI (β -0.24) and months of treatment (β -0.21) were predictors associated with weigh loss (p<0.05). The EXPERIENCED-COHORT included 224 PwO, 99% were on GLP-1RAs and 74.1% were women, with mean age of 53.6±13.1years. Medical records included diabetes (10.7%), prediabetes (22.3%), hypertension (42.8%), dyslipidemia (33.9%), sleep apnea (3.1%), osteoarthritis (8.0%), hepatic steatosis (18.7%) and prior bariatric surgery (5.8%). BMI distribution was: <25 (1.3%), 27-30 (4.5%), 30-35 (34.8%), 35-40 (25.0%), 40-50 (17.4%) and >50 (0.9%). Follow-up was available in 41 PwO, weight loss was -5.9±5.6kg (CI95%: -4.1 to -7.6), -4.6±4.1%, in 5.6±1.8 months of follow-up. Weight loss with ≤1.0mg dose (n=23, BMI 34.8) was -3.9±3.8% (CI95%: -2.2 to -5.6) and in those with 1.7-2.4mg dose (n=18, BMI 35.4) was -5.6±4.4% (CI95%: -3.4 to -7.7). Weight loss achieved with previous ObMeds was -5.6±6.3kg (CI95%: -2.4 to -8.7) in 10.4±7.2 months.
Conclusion: The real-world efficacy of SC-Sema closely mirrors results in clinical trials, promising a clear future in the treatment of obesity. Further research is needed, focusing on results in different obesity phenotypes, with particular attention to hyperresponder PwO.

Conflict of Interest: No conflicts of interest to report.

Funding: No funding to report.

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PO4.291

Interaction between chronobiology and microbiota in obesity management: the case of fasting

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Introduction: Fasting has emerged as a new approach to combat obesity and its comorbidities. The relationship between chrononutrition and the gut microbiota is a concept of great relevance in obesity management.
Objective: To observe the effects of a 16:8 Time Restricting Eating (TRE: 16h fasting/ 8h intake) on the gut microbiota and to study whether the timing of fasting (morning or evening) is determinant for a greater effectiveness in weight reduction.
Methodology
64 Patients with obesity were randomized into two groups to undergo a TRE intervention 16:8 (fasting:eating) differentiated in the eating window time: morning (eTRE) or at evening (lTRE) for 3 months. Anthropometric and biochemical variables were evaluated, as well as the gut microbiota profile (16S rRNA gene sequencing). Gut microbiota functionality was studied through short-chain fatty acids (SCFAs). Additionally, fecal transplants from patient samples were performed in germ-free mice.
Results: Both groups showed a decrease in body weight, but more pronounced in the lTRE (-2.27 (-4.13 to -0.40)). Body composition improved in both groups, but the eTRE group showed a greater reduction in fat mass (-3.73 (-7.14 to -0.31)). About gut microbiota, although the diversity increased in the ITRE group, no significant differences were observed in the gut microbiota beta diversity between groups. Both groups showed changes in their gut microbiota profiles compared to baseline, with the lTRE group displaying a more variety (Lachnospira, Dorea, Blautia, Collinsella, Anaerostipes, UBA1819, Butyricicoccus, Eubacterium xylanophylum group, Dialister Lactobacillu) than the eTRE group (GCA-900066575). Hexanoate and valerate were the SCFAs that showed greater differences between groups. Mice receiving fecal transplants from the lTRE group retained the greatest changes in their microbiota, similar to the human findings, although this group had the highest body weight.
Conclusions: The timing of fasting influences bodyweight and body composition, as well as the gut microbiota, both in terms of taxonomy and functionality. These changes are transferable through fecal transplant, emphasizing the importance of the gut microbiota. The interaction between chronobiology and the gut microbiota may be crucial in managing obesity.

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PO4.292

Bridging the gap between evidence and practice: Exploring the role of body weight in managing lymphoedema

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Introduction: Lymphoedema affects around 450,000 people in the UK, causing pain, disability, and psychological distress. It has long been linked to obesity, with lymphoedema guidelines continuing to advocate for weight loss in those living with overweight or obesity. However, randomised controlled trials state weight management is not, on its own, a treatment for lymphoedema. This study explored the disconnect between evidence and guidelines and examines current clinical practices.
Methods: Following a scoping review of peer-reviewed and grey literature, and a review of lymphoedema guidelines, a mixed method study was conducted. Using consecutive sampling, lymphoedema records (n=120) from two Health Boards in Scotland and two in Wales were audited to assess the role of body weight in lymphoedema management. Practitioners in both regions (n=27/53 in Scotland; n=24/59 in Wales) completed an online questionnaire, and a focus group (n=6) provided qualitative insights. Triangulation was utilised to explore disparities and validate findings. The 'Tailored Implementation for Chronic Diseases Framework' (TICD) identified and grouped determinants of practice, while reflexive thematic analysis was applied to focus group data.
Results: Practitioners in Scotland and Wales shared consistent beliefs regarding the negative impact of a high body weight on lymphoedema outcomes. Cellulitis, wound issues, and reduced quality of life, as well as increased service costs associated with specialist garments, bandaging, and increased treatment time were all described. As such, goals of treatment were often adjusted in response to these challenges.
Individual barriers and enablers which impact whether weight is recorded and/or discussed were also largely consistent across the two countries. However, differences emerged in the frequency of weight-related discussion, how practitioners would respond to an observed increase in body weight between appointments, and confidence in addressing weight. Weight stigma was evident with links to guidelines identified, highlighting systemic barriers and a need for education and training.
While practitioners largely attributed body weight to individual responsibility and energy balance (calories consumed versus expended), many also acknowledged the critical role of psychological and emotional factors in achieving weight related goals. As such, practitioners expressed a need for greater access to multidisciplinary support, including dietetics, psychological care, and physical activity services. They believed increased access to these services would optimise lymphoedema care and improve outcomes.
Conclusion: This study highlights a disconnect between evidence, guidelines, and practice in the management of obesity and lymphoedema. By addressing systemic barriers, rethinking perceptions about body weight, and adopting a holistic, person-centred, and multidisciplinary approach to care, it is possible to improve outcomes for patients and reduce the frustration practitioners experience. The findings challenge current practices and provide a foundation for evidence-based care delivery in this underexplored field.

PO4.293

Effectiveness of intermittent fasting compared with continuous caloric restriction in the treatment of weight regain after metabolic surgery

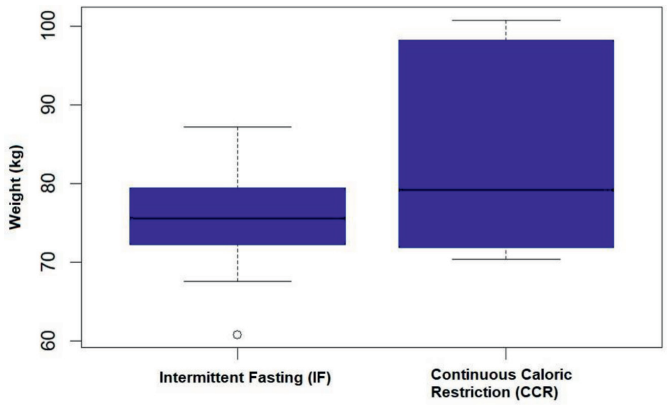
Henao-Carrillo, D. C.[1]; Forero Ramos, A. M.[3]; Gomez-Medina, A. M.[1]; Mikler, R.[5]; Pinzón Cepeda, F. E.[5]; Yepes Cortes, C. A.[2]; Muñoz Velandia, Ó. M.[4]

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Introduction: Managing weight regain after metabolic surgery (MS) is challenging. Current guidelines recommend moderate continuous caloric restriction (CCR) as part of the treatment of weight regain, but another form of caloric restriction is intermittent fasting (IF). IF is associated with additional biological effects such as: increased adaptive responses to stress, efficient elimination of dysfunctional proteins, increased fatty acid mobilization and ketogenesis, modulation of the gastrointestinal microbiota, decreased cell proliferation, improved insulin sensitivity and decreased systemic inflammation, but there are no data on its usefulness in patients with weight regain after MS. This study was designed to evaluate the efficacy of IF compared to CCR in reducing weight in patients with weight regain after MS.

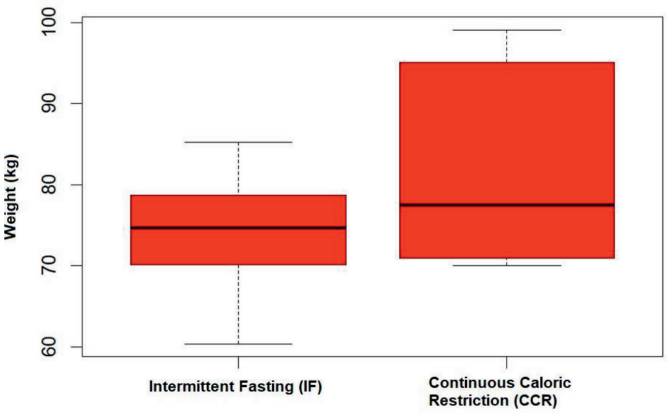
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Methods: Open, randomized, controlled clinical trial. After review of micronutrient supplementation, adult patients treated with MS with ≥2 years of follow-up and weight regain were included. Patients were randomized to IF with caloric restriction of 75% of usual consumption on 2 of the 5 days of the week vs. CCR with 25% daily caloric restriction divided between 3 meals. Patients were monitored by telephone every two weeks to check adherence to the diet and to record physical activity and adverse events. Weekly calorie consumption, clinical and anthropometric data (weight, height, body mass index, abdominal circumference) and body composition (mBCA 514 medical Body Composition Analyzer) were collected at baseline and after 12 weeks of follow-up.
Results: 16 patients were included (mean age 52.9±10.1 years, 95% female, Body Mass Index 32.4±3.5 kg/m2, 7.4±4.3 years post MS) treated with gastric bypass (n=11), gastric sleeve (n=2) or mini-bypass (n=3). The change in mean weight is shown in Figures 1 and 2. Patients assigned to IF (n=6) had a baseline weight of 75±7.5 kg and a 12-week follow-up weight of 74±6.9 kg (mean difference 1.02 kg [95%CI: 0.08-1.96], p=0.035). In patients assigned to CCR (n=10), baseline weight was 83.2±13.1 kg and at 12 weeks follow-up was 81.6±12.9 kg (mean difference 1.56 kg [95%CI:-3.41 - -6.54], p= 0.45). There were no differences in body composition measures. There were no serious adverse events during follow-up.
Conclusion: A statistically significant reduction in weight was observed after 12 weeks in patients treated with IF, with no significant changes in other body composition measures. IF is an effective dietary strategy that could be implemented in the treatment of weight regain in patients with a history of MS.



Mean baseline weight in Kg.

Fig. 1.



Mean weight at the end of 12 weeks of follow-up in Kg.

Fig. 2.

PO4.294

Results of formed 6-month weight reduction program based on complex lifestyle changes in a daytime hospital care for people living with obesity

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Introduction: We have developed a weight reduction method based on complex lifestyle intervention for people living with obesity (BMI≥30 kg/m2) within the framework of the 'Let's Step for Healthy Life Years!' program of Hungarian Society for the Study of Obesity integrated into daytime hospital care.
Objective: To analyse the anthropometric, laboratory and bioimpedance data N=30 during 6 months period based on increasing physical activity and favourable modification of nutrition and lifestyle.
Material-Method: Mean of age: 55.2 y, body weight: 102.1 kg, BMI: 36.1 kg/m2. 6-month control N=14 cases (3 male, 11 female). Hypertension in 12 cases, further complications 1, diabetes mellitus and cholecystectomy 1, DM and hypercholesterolemia 1, IGT and thyroid nodule 1, hypothyroidism 1. N=16 cases treatment duration: 1 case 2.5 months, 1 case 2 months, 3 cases 1.5 months, 4 cases 1 month, 2 cases 3 weeks, while 5 cases did not appear at the first control. Reported reasons of drop out: 8 cases due to work, 2 due to private life, 1 to acute illness, 1 to problematic workload.
Medical examination, ECG, laboratory parameters and body composition by InBody 270 were made. Based on software analysis of NutriComp 5.12, we gave individualized recommendation based on a preliminary 3-day diet interview via internet contact. Every two weeks, we provided dietary consultation and regular body composition and blood pressure control, as well as specialist check-ups if necessary. In addition to the 3 times physiotherapist-led exercise sessions per week, water gymnastics, and daily walking controlled by activity meter was performed independently and reported.
Results: At the enrolment energy intake 2131 kcal/day. Protein intake 16.5 en%, carbohydrate 41.9 en% (low), fat 40.3 en% (excessive). 1.1 en% alcohol. The added sugars 5 en% (favourable). Cholesterol intake excessive 387.1 mg. Fluid intake 1566.7 ml/day, fibre intake, vitamin D, pantothenic acid and folic acid, calcium, chromium, potassium levels do not reach the recommended values. During 6 months 3 times weekly 2x30 minute of aerobic, 4x14 minute instrumental physiotherapy, and daily walking measured (mean of first week 7687 steps/day 5.6 km/day, week 24th: 6475 steps/day 4.8 km/day).
We found for 6 months significantly decreased body weight and BMI (p=0.01), waist circ. (p=0.005), hip circ. (p=0.004), and diastolic BP and HR in tendencies. Laboratory parameters showed a favourable change, LDL and hCRP levels decreased significantly for 3 months ($p<0.05$), uric acid between 3-6 months ($p<0.01$), for 6 months (p=0.05). Body fat kg, fat % and muscle mass were reduced ($p<0.05$), visceral fat decreased (p=0.01). The muscle mass loss showed biologically negligible change due to the exercise programs.
Conclusions: The method has proven to be suitable for the long-term treatment of controlled, slow- paced weight loss in daytime hospital and outpatient settings. In order to ensure compliance and prevent weight regaining after weight loss, it seems expedient to establish a weight-management patient club at institutional level.

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PO4.295

The Impact of Dairy Dietary Phosphorus on Carbohydrate Metabolism in Healthy Individuals

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Introduction: The increasing prevalence of obesity has coincided with a shift towards diets high in refined, nutrient-poor carbohydrates that are low in the macro-mineral phosphorus (P). P plays a crucial role in carbohydrate and energy metabolism. It is responsible for the phosphorylation of glucose to glucose-6-phosphate, an essential step required for intracellular glucose trapping and energy production. Compromises in postprandial P levels is expected to delay postprandial cellular uptake of glucose, impair phosphorylation, and eventually hinder carbohydrate metabolism. Hence, on the metabolic level, a decrease in postprandial P availability can induce several metabolic conditions that favor the development of different components of the metabolic syndrome including glucose intolerance and obesity. Given that milk is known to be a rich source of naturally occurring P, the current study aimed to measure the independent effect of dietary P found in cow's milk on postprandial glycemia, via the continuous monitoring of blood glucose levels. It also aimed to reveal the importance of P contribution in the widely known glycemic lowering ability of milk and dairy foods.
Methods: A randomized, single-blinded, crossover study was conducted over a 10-day period (with a 2-day washout period). Heathy adults (n=16), aged between 18 and 45 years, were asked to consume 500 grams of whole milk (120 grams of powdered milk mixed with water), along with either a P-free placebo capsule or with a phosphate chelator (800mg). Sevelamer carbonate (*Renvela*), an orally administered pharmaceutical, widely approved for the treatment of hyperphosphatemia in patients living with end-stage renal disease, was used for phosphate binding. Blood glucose was monitored using the continuous glucose monitoring Dexcom G6 system.
Results: Bivariable analysis showed that the placebo group had slightly higher baseline blood glucose levels (109 ± 1.8 mg/dl, P=0.0413) compared to chelator group (105.1 ± 2.3 mg/dl), and took a longer time to reach blood glucose peak levels (102.6 ± 8.8 minutes versus 69.6 ± 7.1 minutes, P=0.0102). Chelating P significantly increased post-prandial blood glucose levels, at time 30, 60, 90, 120, 150, and 180 minutes, compared to placebo, with a mean difference of 9.45 mg/dl (P=0.0000), 7.86 mg/dl (P=0.0028), 7.32 mg/dl (P=0.0007), 5.4 mg/dl (P=0.0224), 7.2 mg/dl (P=0.0031), 5.85 mg/dl (P=0.0227), respectively.
Conclusion: By chelating P and preventing its absorption, our findings demonstrate a clear, independent inverse association between dietary P and post prandial glucose levels; indicating that the glycemic benefits of milk - previously ascribed to their protein content - may be confounding the favorable glycemic role of P. Furthermore, results of this study put emphasis on the importance of maintaining optimal P intake levels, which may potentially contribute to the prevention and management of insulin resistance, obesity, and other co-related components of the metabolic syndrome.

Conflict of Interest: None disclosed.

Funding: No funding to report.

PO4.296

Regular intake of β-Glucan/Chitin–Chitosan from *S. cerevisiae* promotes body weight reduction without altering serum micronutrient concentrations in a population with overweight and obesity

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Introduction: The regular consumption of the product containing a β-Glucan/Chitin–Chitosan rich extract obtained from *S. cerevisiae* cell wall (Lipigo®) has been shown to promote the reduction of body weight as well as to minimize the rebound effect in people with obesity who undergo a comprehensive weight loss program (1,2). The present work aims to investigate whether Lipigo® intake for up to 12 months may influence the absorption of nutrients such as vitamins and minerals.
Methods: A randomized, double-blind, placebo-controlled clinical trial in subjects with overweight and obesity (BMI 25–39.9 kg/m2) was conducted. All subjects underwent a comprehensive weight loss program (WLP) for 12 weeks, which comprised an individualized hypocaloric diet, physical activity recommendations and nutritional education seminars. They also consumed three sticks a day containing 1 g of Lipigo® or placebo. After WLP, subjects continued study product intake for 9 months. Blood samples were obtained at baseline, after WLP and at the end of intervention to evaluate different nutritional parameters in serum: total protein and pre-albumin concentrations, vitamins A, E, D, B9 and B12, minerals such as calcium, phosphate, iron, copper and zinc and safety parameters (serum AST, ALT, urate and C reactive protein). The study was registered at http://clinicaltrials.gov under NCT03554525.
Results: A total of 120 subjects 49.0±9.5 years old and with a body weight of 81.57±13.26 kg (BMI 31.19±3.44 kg/m2) were randomized. 98 subjects finished the WLP period and 73 subjects finished the study. At baseline, all nutritional parameters were within normal ranges except for vitamin D, which was below recommended values in both groups. There were no significant differences in nutrient concentrations between groups at any of the study timepoints. Table 1 shows results for some relevant vitamin and mineral concentrations at baseline and at 12 months. Intragroup changes remained within normal ranges and were similar between the groups. Safety parameters did not change throughout the study.
Conclusion: Regular consumption of the Lipigo® product over 12 months together with low caloric diet in individuals with overweight and obesity was not associated to alterations in nutritional or safety parameters and can be considered safe.

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Tab. 1. Serum concentrations of relevant vitamins and minerals.

		PLACEBO	LIPIGO
VITAMINS			
Vitamin A (ug/mL)	Baseline	0.55 (0.11)	0.56(0.12)
	12 months	0.47(0.08)*	0.50(0.14)
Vitamin E (ug/mL)	Baseline	14.70(3.28)	15.07(3.36)
	12 months	12.93(2.73)	13.70(2.88)
Vitamin D (ng/mL)	Baseline	21.92(10.40)	19.45(8.88)
	12 months	25.81(12.25)	25.21(11.34)
Vitamin B12 (pg/mL)	Baseline	441.15(121.22)	432.78(122.59)
	12 months	470.17(145.8)	482.59(154.82)
MINERALS			
Calcium (mg/dL)	Baseline	9.53(0.36)	9.53(0.38)
	12 months	9.40(0.42)	9.56(0.42)
Phosphate (mg/dL)	Baseline	3.60(0.38)	3.58(0.57)
	12 months	3.61(0.46)	3.73(0.50)

Values are means(SD). * Significant difference vs baseline value.

PO4.297

Association between depression and weight loss from Naltrexone-Bupropion in Patients with Obesity: 12 months retrospective study

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Introduction: We previously showed that high anxiety is a potential surrogate biomarker to predict response to naltrexone bupropion (NB) (PMCID: PMC8168710). We aim to understand if also depression is associated with NB weight loss success. The Patient Health Questionnaire (PHQ-9), a validated screening tool for depression. A PHQ-9 score ≥ 10 is a positive screening for depression, indicating that the patient should have a treatment plan involving counseling, follow-up, and/or pharmacotherapy. We want to assess the weight loss response to (NB) based on a positive depression questionnaire.
Methods: We performed a retrospective study using a unified data platform to gather obesity patients taking NB for at least 3 months who completed a PHQ-9 questionnaire before starting the medication. We classified our cohort as a high PHQ-9 (score ≥ 10) which represents positive depression screening and as a low PHQ-9 (score < 10) which represents negative depression screening. We rule out patients who use other anti-obesity medications simultaneously while on (NB). For the statistical analysis and results, categorical data are presented as frequencies and percentages. Continues data are summarized as mean and standard deviations. P-values were calculated with t-test or chi-squared test as appropriate. All P-values <0.05 were considered significant.
Results: We included 185 participants with obesity (52 ±13.8 years, 83% females, total body weight [Kg] 110.1 ±13.4 kg); baseline demographics and anthropometrics per group listed in Table 1. Patients treated with NB and with a high PHQ-9 had a significantly greater the total body weight loss (TBWL%) at 6, 9, and 12 months when compared to patients with low PHQ-9: -7.8± 5.5% vs. -4.4 ± 5.7% (p=0.004) at 6 months, -8.6 ± 6.2% vs. -5.3 ± 6.6% (p=0.04) at 9 months, and –8.1± 6.1% vs. -4.9 ± 6.5% (p=0.003) at 12 months. When assessed at 3 months, the high PHQ-9 cohort showed a (TBWL%) of -5.3 ± 4.1%, compared to -3.8 ± 4.4% in the low PHQ-9 cohort (p=0.17).
Conclusion: We found that patients with obesity treated with NB and with positive depression screening test, (high PHQ-9) loss more weight than those with a negative screening test Further studies are needed to understand the role of PHQ-9 as a potential surrogate biomarker to predict weight loss outcomes in patients treated with Naltrexone-Bupropion.

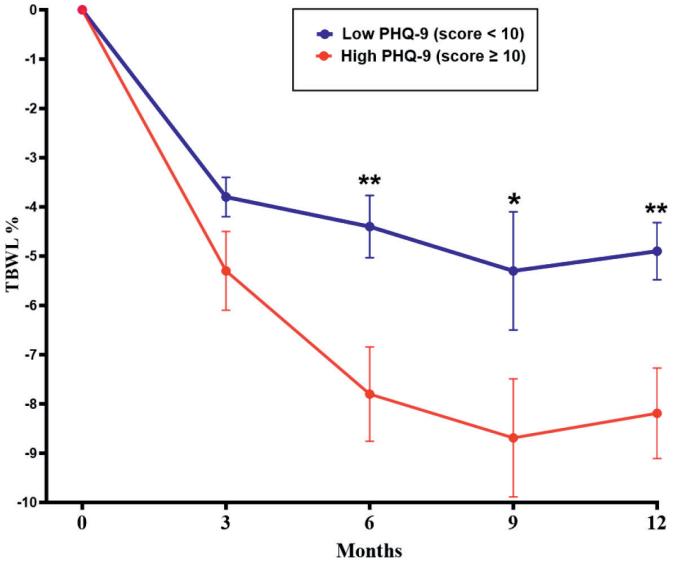


Fig. 1. Weight Loss Outcomes at 12 Months in Participants Using Naltrexone-Bupropion, Assessed with PHQ-9 Questionnaires.

Tab. 1. Baseline Characteristics per High or Low PHQ-9 Questionnaire.

Parameter	High (PHQ-9 ≥ 10) (n=45)	Low (PHQ-9 < 10) (n=140)	p-value
Demographics			
Age, years	53 ± 12.9	49.2 ± 14.7	0.20
Females, n (%)	36 (82)	111 (85)	0.83
White race, n (%)	45 (91)	140 (96)	0.17
Anthropometrics and Body Composition			
Weight, kg	106.8 ± 20.8	111.3 ± 24.9	0.24
Height, cm	106.8 ± 20.8	167 ± 0.08	0.49
Body mass index, kg/m2	38.6 ± 7.5	39.5 ± 7.5	0.47
Questionnaires			
PHQ-9	13.7 ± 3.8	3.6 ± 2.8	< 0.0001

Continuous data are summarized as mean and standard deviations. Categorical data are presented as frequencies and percentages. P-values were calculated with t-test or Pearson's chi-squared test as appropriate. All P-values <0.05 were considered significant. Abbreviations used: PHQ-9, Patient Health Questionnaire-9

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PO4.298

The impact of Obesity management on Stroke prevention

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Introduction: Obesity is a global health crisis and a major risk factor for cardiovascular diseases and strokes. With stroke remaining one of the leading causes of morbidity and mortality worldwide, effective interventions targeting obesity are critical for prevention.
Method: The search was conducted in two databases, PubMed and Scopus, and includes 21 systematic reviews and meta-analyses examining the effectiveness of obesity treatments, such as lifestyle interventions, pharmacotherapy, and bariatric surgery in reducing the risk of stroke.
Results: Lifestyle interventions, such as dietary modification and physical activity, were identified as fundamental strategies for managing obesity and preventing stroke. Regular physical activity was shown to lower stroke risk by approximately 25%, while the Mediterranean diet provided benefits, reducing stroke risk by about 30% through improvements in vascular and metabolic health. Pharmacotherapy, particularly treatments using GLP-1 receptor agonists, also demonstrated promising outcomes. These therapies not only supported weight loss but also contributed to a reduction in stroke risk by around 15%, further reinforcing their potential role in prevention strategies. Bariatric surgery emerged as a highly effective intervention for individuals with severe obesity. Studies consistently reported that this surgical treatment reduced stroke risk by nearly 40%, with long-term benefits observed in weight loss and cardiovascular health. However, several challenges, including surgical risks and postoperative care, have yet to be resolved.
Conclusion: Addressing obesity through lifestyle interventions, pharmacotherapy, and surgical interventions offers a multidimensional approach to reducing stroke risk. This review emphasizes the necessity of personalized care to tackle the dual burden of obesity and stroke effectively.

PO4.299

Weight regain following primary bariatric surgery. How understanding the problem can help target those as risk. Lessons from a UK centre

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Introduction: In the UK, two-thirds (63%) of adults are overweight. (1) Bariatric surgery is available to patients with a BMI > 40 or BMI > 35 and significant co-morbidities. (2) However, weight regain is a common problem following primary bariatric surgery. (3) We look at the factors that affect early weight regain at a single centre in the UK.
Methods: This is a retrospective study of all patients that underwent primary bariatric procedure from 2016-2019, N=442. We compared characteristics of patients that experienced weight regain (> 10% increase from nadir weight loss) at 24 months with those that did not. We invited patients with >10% weight regain for genetic studies alongside a randomised control group. The testing panel contained 79 genes associated with obesity.
Results: A total of 333 patients were included. 25 patients experienced >10% weight regain at 24 months (7.5%). This cohort had a higher male: female ratio, higher gastric sleeve: Roux-en-Y By-Pass ratio and greater diabetic to non-diabetic ratio. Patients with >10% weight regain were more likely to have a smoking history and a pre-operative diagnosis of depression. Nine patients underwent genetic testing. There were more variants associated with obesity in the group that did not experience weight regain >10% (4/5 vs 1/4).
Conclusion: In accordance with prior observational studies, we observed greater weight regain in patients that were older, more likely to be male, have a diagnosis of diabetes or depression and a smoking history. With the expansion of bariatric surgery and obesity medications, knowledge of these factors and genetic testing, may help develop individualised treatment and follow up recommendations.

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Tab. 1. Comparison of patient demographics and outcomes following primary bariatric surgery.

	Total primary procedures N=442	Total with weight at 48 months. N=333	>10% weight regain N=25
Female: Male	349: 93 (79%)	271:62 (81%)	19:6 (76%)
Average age	47 (19-72)	47 (19-72)	50 (23-69)
Average starting BMI	48 (33-83)	47 (33-83)	46 (36-59)
Sleeve:By-Pass	97:345 (28%)	77:256 (30%)	9:16 (56%)
T1DM	3	2	0
T2DM	105 (23.8%)	88 (26%)	12 (48%)
T2DM on insulin	27 (6.1%)	21 (6.3%)	4 (16%)
Smoking/Ex-Smoker/Vaper	133 (30.1%)	102 (30.1%)	9 (36%)
Depression pre-op	121 (27%)	93 (27.9%)	8 (32%)
Appointments attended within 48 months post op	3.8	4.4	4.8

Comparison of patients with and without early weight regain following primary bariatric surgery.

PO4.300

Integrating Myosteatosis and Skeletal Muscle Index for Early Detection of Sarcopenic Obesity in the Elderly

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Introduction: Sarcopenic obesity, characterized by the coexistence of reduced skeletal muscle mass and increased adiposity, is associated with adverse health outcomes, including functional decline, metabolic disturbances, and increased mortality risk. Traditional diagnostic methods often rely on skeletal muscle index (SMI) or anthropometric measures, which may overlook early muscle quality deterioration such as myosteatosis. This study aims to evaluate the utility of integrating computed tomography (CT)-based myosteatosis assessment with SMI to improve the early detection and risk stratification of sarcopenic obesity in the older adults.
Methods: This cross-sectional study included 100 obese older adults with and without sarcopenia (BMI ≥25 kg/m², age ≥60 years) undergoing

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routine clinical evaluation. Sarcopenia was assessed using hand grip strength (HGS) and CT-determined SMI (thresholds: <36.5 cm²/m² for males, <30.2 cm²/m² for females). Myosteatosis was defined as skeletal muscle attenuation measured in Hounsfield unit using CT (<41 HU for BMI <25 kg/m² and <33 HU for BMI ≥25 kg/m²). Diagnostic sensitivity, specificity, and area under the receiver operating characteristic curve (AUC) were compared for SMI alone versus combined myosteatosis. Clinical and functional outcomes, including physical performance and metabolic profiles, were also analyzed.

Results: Sarcopenic obesity prevalence based on HGS and SMI was 42%, with an additional 21% identified through muscle attenuation assessment. Integration of myosteatosis and SMI improved detection rates by 28%, particularly among older adults with high BMI (≥30 kg/m²). The combined approach demonstrated superior diagnostic performance (AUC = 0.81) compared to SMI alone (AUC = 0.65; p < 0.01). Myosteatosis was significantly correlated with poorer short-physical-performance-battery (SPPB) scores, insulin resistance, and elevated inflammatory markers.

Conclusion: Incorporating myosteatosis assessment into routine sarcopenia screening protocols significantly enhances the detection of sarcopenic obesity and facilitates early intervention. This dual-modality approach may aid in the timely identification of at-risk obese patients, enabling personalized management strategies to mitigate functional and metabolic decline.

Conflict of Interest: None Disclosed

Funding: No funding to report

PO4.301

Effect of enavogliflozin on the improvement of hepatic steatosis in patients with type 2 diabetes mellitus: A pooled analysis of three randomized controlled trials

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Introduction: Sodium-glucose cotransporter 2 (SGLT2) inhibitors are a promising class of drugs for the treatment of hepatic steatosis. This study evaluated the efficacy of enavogliflozin (0.3 mg), a newly developed SGLT2 inhibitor, in improving hepatic steatosis among patients with type 2 diabetes mellitus (T2DM). The analysis pooled data from three 24-week, randomized, double-blind, phase III trials.

Methods: A total of 554 patients were included in the study. Enavogliflozin (0.3 mg/day) was administered to 75 patients in the placebo-controlled trial (placebo: n = 71) and to 204 patients in the active comparator-controlled trial, alongside dapagliflozin (10 mg/day; n = 204). The likelihood of hepatic steatosis was assessed using the Framingham Steatosis Index (FSI) and Hepatic Steatosis Index (HSI). Participants with hepatic steatosis as baseline (FSI ≥1.2 or HSI >36) were evaluated for changes in the degree of hepatic fibrosis by using non-invasive serologic markers, including the Fibrosis-4 (FIB-4) index and the Non-Alcoholic Fatty Liver Disease Fibrosis Score (NFS).

Results: At baseline, approximately 50% of participants had hepatic steatosis across all three trials. After 24 weeks of treatment, enavogliflozin significantly reduced the proportion of participants with hepatic steatosis compared to placebo (41.3% to 16.0% for FSI, and 48.0% to 16.0% for HSI; P < 0.001 for both). In the active comparator-controlled trial, enavogliflozin also significantly reduced the prevalence of hepatic steatosis, but the reductions were not significantly different from those achieved with dapagliflozin (P = 0.5497 for FSI, P = 0.7235 for HSI). Among participants with hepatic steatosis at baseline, enavogliflozin did not lead to significant changes in FIB-4 or NFS values compared to placebo or dapagliflozin over the 24-week treatment period.

Conclusion: Enavogliflozin demonstrated significant efficacy in reducing hepatic steatosis in patients with T2DM, comparable to dapagliflozin. However, its effect on hepatic fibrosis was neutral. The potent SGLT2 inhibitors like enavogliflozin represents an attractive therapeutic option for patients with both T2DM and hepatic steatosis.

PO4.302

Efficacy of Semaglutide in Patients with Obesity Based on Edmonton Staging

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Introduction: Obesity is a chronic disease reaching epidemic proportions. In Spain, approximately 24% of the adult population lives with obesity. Limited resources, particularly access to bariatric surgery, have driven the development of tools like the Edmonton Obesity Staging System (EOSS) to prioritize patients with more or poorly controlled comorbidities. However, it is unknown whether the effect of semaglutide differs depending on the Edmonton stage.

Objectives: To determine whether the presence and/or severity of obesity-related complications, classified using the Edmonton system, results in a different response to semaglutide in patients with obesity.

Methods: A total of 26 patients with Edmonton stage 0 were compared to 24 patients with a stage higher than 1 who had received semaglutide treatment for a minimum of 4 months. Anthropometric and body composition parameters were measured at baseline and after at least 4 months of follow-up.

Results: Baseline anthropometric and body composition characteristics were comparable between both groups. When analyzing the results at the end of the intervention, there were no significant differences between both groups (Edmonton 0 vs Edmonton ≥1) in the following variables: percentage of fat mass loss (3,19±3,15 vs 6,36±9,51%; p=0,14), fat mass loss in kg (6,18±7,08 vs 8,48±7,70kg;p=0,34), visceral fat reduction index (3,12±2,11 vs 3,7±2,40; p=0,93), weight lost (10,74±14,74 vs19,56±14.6;p=0,22) and percentage of weight loss (9,03±5,57 vs 11,38±7,78;p=0,29). Only the reduction in waist circumference was significantly greater in patients with a higher Edmonton stage (8.7±6.1 vs. 4.7±3.1 cm; p=0.01).

Conclusions: While the Edmonton staging system is an excellent clinical tool for prioritizing bariatric surgery waitlists, it should not limit access to anti-obesity medications like semaglutide. The effectiveness of semaglutide in reducing weight, fat mass, and visceral fat appears similar regardless of the presence of obesity-related complications. Interestingly, the greater reduction in waist circumference observed in patients with more comorbidities—where cardiovascular risk is higher—suggests its potential value in supporting funding decisions.

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PO4.303

Cortical Thickness and White Matter Hyperintensity Changes Are Associated With Sarcopenia in the Cognitively Normal Older Adults

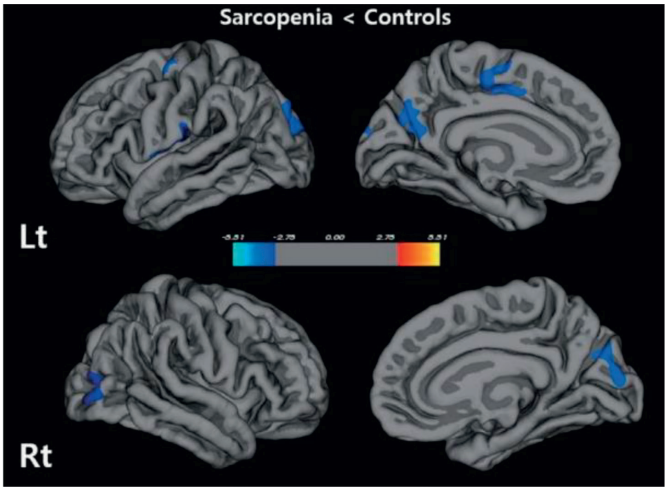
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Introduction: Although few studies have investigated total brain or lobar volumes in comparison between the patients with sarcopenia and the healthy controls, there have been no studies to explore cortical thickness change in elderly with sarcopenia. We aimed to explore the impact of sarcopenia on the cortical thickness, white matter hyperintensity (WMH), and subcortical volumes in the cognitively normal older adults.
Methods: One hundred cognitively normal older adults with and without sarcopenia were enrolled in the study. They underwent T1 and FLAIR magnetic resonance imaging. Information on muscle mass, muscle strength and muscle function were measured using bioelectrical impedance analysis, handgrip strength and 5 time-chair stand test (CST) respectively. Structural magnetic resonance images were analyzed and processed using Freesurfer v6.0.
Results: Compared to the control group, the sarcopenia group demonstrated reduced cortical thickness in left superior frontal, precentral, right post central, inferior parietal, rostral middle frontal superior parietal and both lateral occipital and paracentral gyrus. Volumes of left hippocampus, and periventricular WMH were also reduced in the Sarcopenia group. In addition, we found a significant positive correlation between the left precuneus thickness and muscle mass. Periventricular WMH volumes were also positively correlated with the 5CST score.
Conclusion: Sarcopenia affects cortical and subcortical structures in the cognitively normal older adults. These structural changes might be associated with underlying neurobiological mechanisms of sarcopenia in the cognitively normal older adults.

Conflict of Interest: None Disclosed

Funding: No funding to report



Statistical maps corrected for age, education, and sex showing reduced cortical thickness in the sarcopenia group relative to the control group (Monte Carlo Z simulation, p<0.05)

Fig. 1. Statistical maps.

PO4.304

Challenging cases of hypoglycaemia following bariatric surgery

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Introduction: Bariatric surgery (BS) carries significant metabolic benefits, including diabetes remission. Post-bariatric surgery hypoglycaemia (PBH) is a complication that can occur after BS. PBH is characterised by a blood glucose (BG) level below 3.0 mmol/L, with neuroglycopenic symptoms meeting Whipple's triad after ruling out other hypoglycaemia causes. The pathophysiology of PBH is complex involving changes in nutrient absorption and pancreatic function. Diagnosing PBH can be challenging due to the lack of consensus on diagnostic criteria. Management strategies include dietary modifications, pharmacotherapy (including acarbose, somatostatin analogues, diazoxide, and glucagon-like peptide-1 receptor agonists), and surgical options like endoscopic transoral outlet reduction (TORE), or surgery reversal. In this report, we present two cases of PBH that posed significant management challenges.
Method: We reviewed the electronic patient records to analyse the type of BS, presentation, investigations, and management strategies.
Results: Case 1: A 41-year-old female with a history of Roux-en-Y gastric bypass surgery, resulting in a 51% of excess weight loss, presented with recurrent PBH one year post-surgery. Diagnosis was confirmed with mixed meal test, negative 72-hour fasting test. Despite dietary modifications and trials with acarbose, octreotide, diazoxide, and liraglutide, as well as TORE due to a wide-open gastrojejunal anastomosis, she is still symptomatic. Continuous glucose monitor was used to alert low BG.
Case 2: A 54-year-old female who underwent laparoscopic sleeve gastrectomy and achieved a 64.8% of excess weight loss exhibited frequent near-collapse hypoglycaemic episodes one year after BS. Her symptoms did not improve with dietary changes or diazoxide. She was intolerant to acarbose but responded well to semaglutide. Both patients reported severe impacts on their quality of life, experiencing functional impairment and emotional distress.
Conclusion: PBH can lead to a diminished quality of life and serious complications from recurrent hypoglycaemia, including impaired hypoglycaemia awareness, cognitive dysfunction, cardiac arrhythmias, and even mortality. Despite ongoing research, a better understanding of PBH mechanisms and optimal treatment approaches remain a critical focus in post-bariatric care.

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PO4.305

Exploring glycemic levels in non-obesity women with PCOS: A pilot study comparing to controls

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Introduction: Women with polycystic ovarian syndrome (PCOS) are at higher risk for metabolic complications like insulin resistance, glucose intolerance, type 2 diabetes, and cardiovascular diseases. Early detection

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of glucose changes in women with PCOS is essential for preventive measures and long-term health management. This study evaluates glycemic levels in non-obesity women with PCOS compared to healthy women.
Methods: Ten women (20-35 years old) with PCOS (BMI 18.5-29.9 kg/m²) and five healthy women (20-35 years old, normal BMI) were recruited. All participants underwent a 7-day period of continuous glucose monitoring (CGM) system. They were asked to maintain their habitual diet and physical activity. PCOS patients reported using metformin and inositol supplements. Glycemic levels were averaged every 15 minutes over 24 hours for 7 days. Body composition and anthropometric measurements were taken. Statistical analysis was done using Prism 8.0.
Results: The PCOS group had a higher BMI compared to the control group ($p<0.04$). There was a tendency for the PCOS group to have a higher waist-to-height ratio ($p<0.07$) and percentage of fat mass ($p<0.09$). Muscle mass did not differ between groups. No statistical differences were found in interstitial glucose levels between groups; however, the PCOS group showed greater variation and more hypoglycemic events (glucose levels <69 mg/dL) compared to the control group. The mean interstitial glucose levels were 86.9 ± 9.8 mg/dL in the PCOS group versus 91.3 ± 7.5 mg/dL in the control group. The PCOS group had a non-statistically significant higher percentage of time in hypoglycemia compared to the control group. The mean percentage of time in hypoglycemia was 6.8 ± 8.8% in the PCOS group versus 1.8 ± 1.5% in the control group ($p=0.22$).
Conclusion: There were no significant differences in mean interstitial glucose levels between women with PCOS without obesity and the control group. However, the PCOS group exhibited greater variability in glucose levels and a higher incidence of hypoglycemic events. These findings suggest that even in the absence of obesity, women with PCOS may experience more pronounced fluctuations in glycemic levels, highlighting the importance of monitoring and managing glucose levels in this population to prevent potential metabolic complications. Further research with larger sample sizes is warranted to confirm these observations and to explore the underlying mechanisms.

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Conflict of Interest: None disclosed.

Funding: No funding to report.

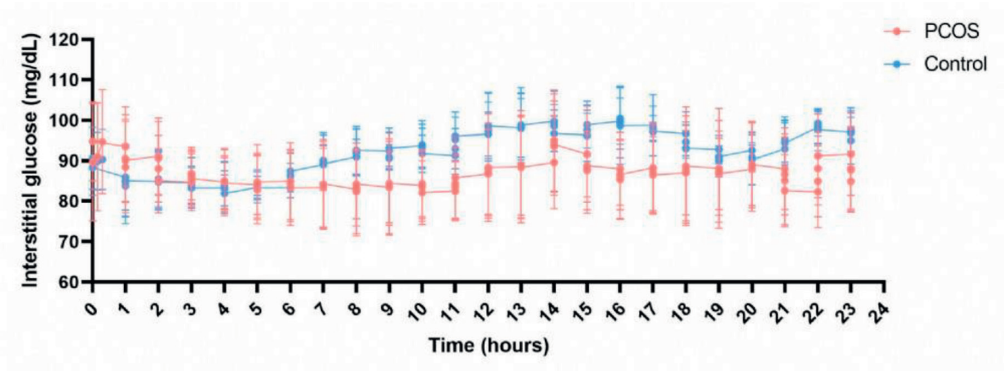
PO4.306

The effect of non-pharmacological sleep interventions on anthropometric measurements in people with sleep insufficiency: a systematic review and meta-analysis

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Background: Sleep insufficiency and disturbances are increasing globally and whether they relate to quality, timing, or duration, they are associated with increased weight and adiposity. Accordingly, there has been interest in examining whether improving sleep can improve anthropometric measurements. We reviewed studies aimed at improving sleep using (1) Cognitive Behavioural Therapy for Insomnia (CBT-I) and/or sleep hygiene and (2) sleep extension on anthropometric measurements of weight, body mass index (BMI) and waist circumference (WC).
Methods: Structured literature searches were conducted on bibliographic databases of MEDLINE, EMBASE, CINAHL and Cochrane. Studies of sleep interventions in adults ≥ 18years with pre- and post-intervention anthropometric measurements available were included. Obstructive sleep apnoea and drug studies were excluded. From the extracted data, pooled mean differences were calculated using the inverse variance method in random effects models.
Results: A total of 15 studies (ranging from 2 weeks to 12 months) were included in the meta-analyses. Eight studies (n=505) reporting on weight outcomes demonstrated a significant reduction averaging 2.80 kg (95% CI 0.81, 4.78; p=0.006, heterogeneity (I2) 93%) compared to control. In four CBT-I and/or sleep hygiene studies (n=271), the weight reduction averaged 6.28 kg (0.99, 11.56; p=0.02, I2 91%), but it was not significant in four sleep extension studies (n=234), 0.28 kg (-0.71, 1.27; p=0.58, I2 71%). Nine studies (n=1,346) reporting on BMI outcomes demonstrated a non-significant reduction averaging 0.40 kg/m2 (-0.13, 0.93; p=0.14, I2 74%) compared to control, however, seven studies of CBT-I and/or sleep hygiene (n=1,282) showed a significant reduction averaging 0.75 kg/m2 (0.31, 1.18; p=0.0008, I2 27%).
Seven studies (n=444) reporting on WC outcomes demonstrated a non-significant reduction averaging 0.94cm (-1.93, 3.82; p=0.52, I2 83%), a trend which was also observed in both individual interventions. For five studies of CBT-I and/or sleep hygiene, a non-significant WC reduction averaged 1.40cm (-3.34, 6.14; p=0.56, I2 83%).



The PCOS group had a non-statistically significant higher percentage of time in hypoglycemia compared to the control group.

Fig. 1. Average interstitial glucose between groups.

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Conclusions: In pooled analyses of pilot studies of people with sleep insufficiency, using CBT-I and/or sleep hygiene significantly reduced levels of weight and BMI. As this non-pharmacological sleep intervention is feasible and efficacious, future research should focus on conducting large scale randomised trials, to determine if it could be a cost-effective lifestyle adjunct to interventions of diet and physical activity to aid the treatment of people living with obesity.

PO4.307

Neck Circumference and Its Association with Diabetes Prevalence in Korean Adults

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Background: Despite the established link between various anthropometric measures and diabetes mellitus (DM), research exploring the association between neck circumference (NC) and DM is limited, particularly in the Korean population. NC, an indicator of upper-body subcutaneous fat, is thought to be a stable and reliable metric that may reflect metabolic risk independently of other body measurements like body mass index (BMI) and waist circumference (WC). This study aims to evaluate whether NC can serve as a predictive marker for the prevalence of DM, providing a simpler and potentially more accessible tool for early screening and intervention in diverse clinical settings
Methods: This study comprised of 11,364 Korean adults over 40 years of age who participated in Korea National Health and Nutrition Examination Survey(KNHANES) in 2019, 2020, and 2021. Participants were categorized into 4 quartiles (Q1–Q4) according to their NC and compared the odds ratios(ORs) and 95% confidence intervals(CIs) of the prevalence of DM, using multivariable logistic regression analysis. The data were adjusted for age, sex, income, education, occupation, smoking, drinking, physical activity, hypertension, hypercholesterolemia, BMI and waist circumference(WC).
Results: Among the 11,364 participants, 43.5% were male (N=4941) and 56.5% female (N=6423), with average ages of 56.53±0.21 and 57.61±0.22 years, respectively. Statistical analysis revealed a significant increase in the odds of diabetes mellitus (DM) in the highest quartile of neck circumference (NC) compared to the lowest across both genders (male: OR 1.558, 95% CI 1.132-2.142, p<0.05; female: OR 2.045, 95% CI 1.452-2.878, p<0.01). Subgroup analysis further showed a stronger association in individuals aged 40-60, with the most pronounced effect observed in the 40s age group (OR 4.095, 95% CI 1.872-8.959, p<0.001). These findings persisted across multiple adjusted models, underscoring NC as a significant independent risk factor for DM.
Conclusion: This study confirms a significant association between increased neck circumference (NC) and the prevalence of diabetes mellitus (DM) among the Korean adult population. The findings suggest that NC, as an easily measurable and stable anthropometric indicator, not only correlates with metabolic risk but may also serve as a practical screening tool for early detection of DM.

PO4.308

Nonalcoholic Fatty Liver Disease Changes Linked to Hepatocellular Carcinoma Risk: A Nationwide Cohort Study

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Background: Nonalcoholic fatty liver disease (NAFLD) is an increasingly common cause of hepatocellular carcinoma (HCC). And NAFLD is reversible; however, the effect of changes in NAFLD status on HCC risk is unknown. We aimed to investigate the effects of changes and persistence in NAFLD status on HCC risk.
Methods: This nationwide cohort study included 1,050,476 adults without HCC cancer who underwent 2 consecutive biennial health screenings provided by the Korean National Health Insurance System between 2009 and 2012 and were followed up until 2017. The fatty liver index 30 and more was used as a diagnostic biomarker for NAFLD. Participants were categorized into the NAFLD-free, NAFLD-recovered, NAFLD-developed, or NAFLD-persistent group The primary outcome was newly diagnosed HCC using ICD-10 codes during follow-up until 31 December 2018. Cox regression analysis was used to estimate hazard ratios (HRs) and 95% confidence intervals (95% CIs).
Results: Among subjects, 5,345 subjects (0.51%) were identified as having HCC, during 5.1 years median follow up. Compared with the NAFLD-free group, the NAFLD -persistent group had the highest risk of HCC (HR, 1.76; 95% CI, 1.64–1.88), followed by the NAFLD-recovered group (HR, 1.23; 95% CI, 1.12–1.36) and the NAFLD- developed (HR, 1.23; 95% CI, 1.10–1.39) after adjusting for potential confounders (P for trend <.001). The NAFLD-recovered group was associated with a lower risk of HCC than that in the NAFLD-persistent group (P <.001). The association between changes in NAFLD status and HCC risk differed according to age group. Compared with the NAFLD-free group, the NAFLD -persistent group had the highest risk of HCC in age 40 and over. The NAFLD-recovered group had the highest risk of HCC in age 60 and over. The NAFLD-developed group had the highest risk of HCC in age 70 and over.

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Tab. 2. Odd ratio and 95% confidence intervals for the prevalence of diabetes mellitus according to neck circumference.

	Model 1	Model 2	Model 3	Model 4	Model 5
Q1-3	1 (ref.)	1 (ref.)	1 (ref.)	1 (ref.)	1 (ref.)
Q4	2.462 (2.195, 2.762)	2.817 (2.493, 3.184)	2.37 (2.086, 2.693)	1.676 (1.436, 1.955)	1.535 (1.312, 1.794)
p	<.0001	<.0001	<.0001	<.0001	<.0001
Q1	1 (ref.)	1 (ref.)	1 (ref.)	1 (ref.)	1 (ref.)
Q2	1.384 (1.167, 1.64)	1.434 (1.208, 1.702)	1.375 (1.155, 1.636)	1.198 (1.002, 1.432)	1.113 (0.929, 1.333)
Q3	1.823 (1.54, 2.159)	1.91 (1.612, 2.263)	1.713 (1.437, 2.042)	1.36 (1.12, 1.651)	1.205 (0.989, 1.468)
Q4	3.423 (2.901, 4.038)	4.044 (3.409, 4.797)	3.259 (2.734, 3.885)	2.147 (1.719, 2.683)	1.788 (1.42, 2.25)
p for trend	<.0001	<.0001	<.0001	<.0001	<.0001

Values are presented as OR (95% CI). Q, quartile; OR, odds ratio; CI, confidence interval; BMI, body mass index; ref., reference Model 1 unadjusted Model 2 age, sex Model 3 age, sex, income, education, occupation, smoking, drinking, physical activity, hypertension, hypercholesterolemia Model 4 age, sex, income, education, occupation, smoking, drinking, physical activity, hypertension, hypercholesterolemia, BMI Model 5 age, sex, income, education, occupation, smoking, drinking, physical activity, hypertension, hypercholesterolemia, BMI, waist circumference OR and 95% CI were estimated using multiple logistic regression analysis with complex samples.

Conclusion: In this study, recovering from NAFLD was associated with a reduced risk of HCC compared with persistent NAFLD, suggesting that HCC risk can be altered by changes in NAFLD status and cumulative exposure time of NAFLD status.

PO4.309

Impact of Baseline Body Mass Index on the Effectiveness and Safety of Torsemide-Spironolactone Fixed-Dose Combination in Indian Patients with Heart Failure: Subgroup Analysis from the Restore-HF Study

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Introduction: Obesity is recognized as a risk factor for heart failure (HF). Understanding the impact of baseline body mass index (BMI) can help to improve HF management. This subgroup analysis aimed to evaluate the effectiveness and safety of a fixed-dose combination (FDC) of torsemide/spironolactone (T/S) in Indian patients with HF as per baseline BMI.
Methods: This was a real-world prospective, multicentre, observational study of patients with HF in India from October 2023 to June 2024. Adults aged ≥18 and ≤ 75 years (y) with HF (NYHA class 2&3) and receiving T/S FDC were included. The primary endpoint was to assess the change in body weight from baseline to 3 weeks (end of study-EOS). This analysis is carried out to understand the treatment effectiveness of T/S FDC as per baseline BMI categories G1 (>30 kg/m²), G2 (25-30 kg/m²) and G3 (<25 kg/m²). Ethics Committee approval and Informed consent were obtained.
Results: A total of 1,520 patients were analysed, as per BMI categories G1 (n=369), G2 (n=573), and G3 (n=578), with mean (SD) age in years (y) being 59.05 (10.25), 58.49 (9.45), 58.45 (8.91), respectively. At baseline, the mean (SD) weight (kg) in G1, G2 and G3 was 84.41 (8.77), 74.58 (8.39) and 70.83 (6.62), which reduced to 81.56 (8.35), 72.14 (8.48) and 68.74 (7.05) showing a significant mean reduction of 2.85, 2.45 and 2.09 (P<0.001 for all), respectively, at EOS. There were 3 reported adverse events (all mild in severity) all 3 were in G2. Summary of changes in blood pressure, serum potassium, NYHA class, and pitting oedema are shown in Table.
Conclusion: Results showed that T/S FDC demonstrated a significant weight reduction in Indian patients with HF across all BMI categories with acceptable tolerability.

Tab. 1. Summary of BMI-wise outcomes.

Parameter	Time points	BMI	BMI	BMI	P-value
-	-	G1: >30 kg/m2; (n=369)	G2: 25-30 kg/m2; (n=573)	G3; <25 kg/m2; (n=578)	-
SBP (mmHg), mean (SD)	Baseline	133.67 (2.94)	133.43 (3.13)	133.27 (3.48)	-
SBP (mmHg), mean (SD)	End of study	128.79 (7.15)*	128.76 (6.46)*	128.43 (7.16)*	0.397
DBP (mmHg), mean (SD)	Baseline	86.09 (4.00)	87.07 (4.07)	87.43 (4.07)	-
DBP (mmHg), mean (SD)	End of Study	84.95 (2.36)*	85.10 (2.39)*	84.92 (2.37)*	0.311
Serum Potassium (mEq/L), mean (SD)	Baseline	4.09 (0.49)	4.09 (0.49)	4.06 (0.46)	-
Serum Potassium (mEq/L), mean (SD)	End of Study	4.56 (0.59)	4.58 (0.59)	4.63 (0.58)	0.467
NYHA	-	-	-	-	-
Class 3, n	Baseline	127	151	173	-
Class 3, n	End of Study	19	23	22	-
Class 2, n	Baseline	242	422	405	-
Class 2, n	End of Study	149	160	195	-
Class 1, n	Baseline	0	0	0	-
Class 1, n	End of Study	201	390	361	-
Pitting Oedema	-	-	-	-	-
Grade 4, n	Baseline	43	73	88	-
Grade 4, n	End of Study	15	26	26	-
Grade 3, n	Baseline	130	152	163	-
Grade 3, n	End of Study	60	81	70	-
Grade 2, n	Baseline	126	207	198	-
Grade 2, n	End of Study	109	162	144	-
Grade 1, n	Baseline	70	141	129	-
Grade 1, n	End of Study	125	174	192	-
Grade 0, n	Baseline	-	-	-	-
Grade 0, n	End of Study	60	130	146	-
Data presented as n. unless otherwise specified. *P<0.005 BMI, body mass index; BL, baseline; DBP, diastolic blood pressure; NYHA, New York Heart Association; SBP, systolic blood pressure; SD, standard deviation.	-	-	-	-	-

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PO4.310

Association between steatotic liver disease (SLD) and gynecologic cancer: population-based study

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Background: It is unclear whether there is an association between steatotic liver disease (SLD) and gynecologic cancer. We investigated the association between steatotic liver disease (SLD) and gynecologic cancer in the general population.
Method: This was a retrospective, observational, cohort study using data from the National Health Information Database from 2009 to 2018 and included 2,133,321 subjects, aged ≥40 years (premenopausal: 886,822 & postmenopausal: 1,246,499). We were divided into six groups based on steatosis status by fatty liver index(FLI), cardiometabolic risk factor, alcohol intake and concomitant liver disease; no steatosis (NS; FLI<30), metabolic dysfunction–associated steatotic liver disease (MASLD), metabolic alcohol-associated liver disease (MetALD), alcohol-associated liver disease (ALD), specific etiology SLD, and cryptogenic SLD. The primary outcome was newly diagnosed cervical, uterine, or ovary cancer using ICD-10 codes during follow-up until 31 December 2018. Cox regression analysis was used to estimate hazard ratios (HRs) and 95% confidence intervals (95% CIs).
Result: Among subjects, 1,626,472 subjects (23.8%) were identified as having SLD [premenopausal: 121,784 (13.7%) & postmenopausal: 385,065 (30.9%)]. During the follow-up period (8.3 years), 1,879 (0.25 case/1000py) cervical, 1,822 (0.24 case/1000py) uterine and 2,448 (0.33 case/1000py) ovary cancer cases were identified in premenopausal subjects and 2,750 (0.27 case/1000py) cervical, 1,921 (0.19 case/1000py) uterine and 3,433 (0.33 case/1000py) ovary cancer cases in postmenopausal subjects. Comparing with NS, MASLD was associated with uterine (HR 1.17, 95% CI 1.46–1.84), and ovary (HR 1.22, 95% CI 1.09–1.37) cancer, and MetALD was associated with cervical (HR 1.87, 95% CI 1.21–2.89) cancer in premenopausal subjects. Among postmenopausal subjects, MASLD was associated with cervical (HR 1.12, 95% CI 1.03–1.22), uterine (HR 1.49, 95% CI 1.35–1.64), and ovary (HR 1.16, 95% CI 1.08–1.25) cancer comparing with NS. However, other SLD classes were not associated with gynecologic cancer.
Conclusion: In this large population study, MASLD was associated with higher risk of gynecologic cancer.

PO4.311

Effective strategies for weight loss maintenance in adult patients with obesity: a systematic review

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Introduction: Obesity is a major public health problem. Maintaining a 5-15% weight loss considerably improves the prognosis of patients with obesity. While, short-term weight loss can be achieved by most patients, 30-50% of the lost weight is typically regained within the first year after weight loss and at least 50% of patients regain their initial weight within 5 years. Therefore, implementing strategies for improving weight loss maintenance is one of the most pressing matters in obesity treatment. The aim of this systematic review is to answer the question: What strategies have been shown to be effective in promoting weight loss maintenance in adult patients with obesity?
Methods: This systematic review was conducted following the PRISMA statement. A systematic literature search was conducted in PubMed, Web of Science and Scopus databases to explore and report the existing evidence on weight loss maintenance strategies. The search strategy was constructed focused on population, weight loss maintenance intervention, weight loss intervention and study design. The search equation in PubMed was as follows: ((((adult*) AND ((obes*) OR ('overweight')))) AND (('weight') AND (((((maintenance') OR ('cycling')))) OR ('gain'))) OR ('regain'))) OR ('trajectory')))) AND ((('reduction') OR (loss*)))))) AND ((('clinical') OR ('controlled'))) AND (trial*)). The search strategies for the other databases were identical, except for differences in formatting depending on the database.
The selection of articles included in this paper was done by uploading all references into the Rayyan tool. First, duplicate references were removed and then 2 reviewers screened titles and abstracts and assessed the eligibility of full-text articles according to inclusion and exclusion criteria. Inclusion criteria: age 18-70 years, BMI greater than 30 kg/m^2; having achieved at least 5% weight loss; and, investigating a weight maintenance intervention longer than 6 months in a controlled clinical trial. Weight change was the primary outcome.
Results: The search yielded a total of 6842 articles from the three databases. After removing duplicates and articles without authors, 4529 articles were obtained. We then screened the titles, abstracts and full articles. A total of 57 studies met the inclusion criteria and were included. The interventions in these articles were classified as nutritional interventions, pharmacological interventions, bariatric surgery, physical exercise interventions, self-help groups, behavioural therapy and cognitive behavioural therapy. Some of the strategies proven as beneficial are increased protein intake, the use of liraglutide, bariatric surgery or a focus on small changes in dietary habits or physical activity.
Conclusion: This systematic review provides an overview of the strategies that have been shown to be effective in preventing weight regain in patients with obesity. However, it also concludes that more clinical trials evaluating these strategies are needed.

PO4.312

Association between obesity and the triglyceride glucose index as insulin resistance marker

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Background: The triglyceride glucose (TyG) index is an inexpensive clinical surrogate marker for insulin resistance. However, the relationship between TyG index and various body composition maker for obesity remains unclear. We evaluated the relationship between TyG index and various body composition maker for obesity using a large- scale population dataset from the Korea National Health and Nutrition Examination Survey (KNHANES) between 2008 and 2010.
Methods: We performed a cross-sectional study that included 19947 participants aged ≥ 19 years using the KNHANES. We divided the participants into TyG index quartiles. We evaluated the risk for highest quartiles of TyG index in the obesity defined by various body composition makers. The TyG index was calculated as ln [triglyceride (mg/dL) × fasting plasma glucose (mg/dL)/2]. Dual-energy X-ray absorptiometry was used to measure the body composition.
Results: Obesity by body mass index was associated with 2.987 time (95% CI: 2.794-3.193) higher risk for higher TyG index. Obesity by Waist circumference was associated with 3.170 time (95% CI: 2.959-3.396) higher risk for higher TyG index. Obesity by fat% was associated with 2.075 time (95% CI: 1.942-2.217) higher risk for higher TyG index. Among the

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subject with Obesity by BMI, WC (area under curve; AUC=0.610) was more associated with higher TyG index comparing fat% (AUC=0.418). Obesity. Subjects with obesity by both BMI and WC was 3.874 time (95%CI: 3.586-4.185) higher risk for higher TyG index comparing with subjects
without obesity. Subjects with obesity by BMI or WC not both was 2.597 time (95%CI: 2.378-2.836) higher risk for higher TyG index comparing with subjects without obesity.
Conclusion: Higher TyG index was associated obesity by BMI, WC, and fat%. However, comparing BMI and WC, fat% was relatively lower associated with higher TyG index.

PO4.313

Efficacy of tirzepatide therapy on weight-loss in non-diabetic subjects with obesity and with weight regain after bariatric surgery

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Introduction: Tirzepatide (T), a dual GLP-1 RA/gastric inhibitory polypeptide (GIP) agonist, has demonstrated efficacy on weight loss in subjects with obesity or overweight, with and without type 2 diabetes (T2D), in randomized clinical trials. In Italy T was authorized in February 2024. Bariatric surgery, such as Roux-en-Y gastric bypass (RYGB), laparoscopic gastric banding (LGB) and laparoscopic sleeve gastrectomy (LSG), is considered the gold standard treatment to achieve long-term weight-loss in severe obesity. In patients with weight regain after bariatric surgery, pharmacological treatment may be required. Here, we reported our real-life experience on efficacy and safety of T treatment in non-diabetic patients followed in our outpatient clinic with obesity and who regained weight after bariatric surgery.
Patients and Methods: We retrospectively evaluated the efficacy and safety of T in 12 female non-diabetic subjects (mean age: 44,7±6,9 years) with obesity on weight loss after bariatric surgery (8 LSG and 4 RYGB). Patients were followed from February to December 2024. T was administered after weight regain once-weekly subcutaneously at starting dose of 2.5 mg and with monthly increases up to 15 mg. All patients were required to follow dietary and behavioral advice with concomitant drug treatment. Treatments were administered when a weight gain of 10-15% occurred after reaching a minimum weight loss from bariatric surgery or if weight-loss after bariatric surgery was unsatisfactory. The aim of this study was to evaluate the efficacy and safety of T therapy in this setting of patients.
Results: Weight (W) and body mass index (BMI) before and after surgery (nadir) were respectively of 131,9±24,1 kg and 47,1±5,2 kg/m2, and 81,0±12,7 kg and BMI 28,9±4,1 kg/m2. After a mean of 2,6±0,9 years from bariatric surgery, all 12 patients started T treatment. At this time, mean W was 92,7±17,1 kg, and mean BMI 33,2±4,3 kg/m2, with a mean W and BMI increases of respectively of 11,7±4,9 kg and 4,2±1,9 kg/m2 from mean W and BMI nadir obtained after bariatric surgery. After a mean of 9,3±1,0 months from the beginning of T therapy, patients reached a mean W of 77,6±13,6 Kg and mean BMI of 27,8±3,3 kg/m2 with a mean W and mean BMI reduction respectively of -15,1±4,1 kg (mean percentage W reduction: -19,4±3,4 %) and -5,4±1,3 kg/m2. Treatment with T was well tolerated, and no patients had severe adverse events such as nausea or vomiting.
Conclusions: Our results confirm the efficacy and safety of real-life therapy with T in our non-diabetic patients with obesity and who experienced weight regain after bariatric surgery.

PO4.314

A descriptive Real World Study of people receiving either reimbursed or non-reimbursed treatment for obesity in Spain

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Introduction: In 2024, anti-obesity drugs have achieved a significant milestone in Spain with the commercialization of semaglutide and tirzepatide for obesity indications. Considering this context, it is important to understand the profile of patients receiving pharmacological treatments for obesity in daily clinical practice. The aim of the study is to describe the sociodemographic and clinical characteristics of individuals who have been prescribed either reimbursed or non-reimbursed treatment for obesity diagnosis in Spain in 2024.
Methods: The demographic and clinical characteristics of people prescribed anti-obesity drugs, as recorded in IQVIA's electronic medical records (IQVIA's EMR), were analyzed. IQVIA's EMR contains data from a reference population of 1.4 million individuals across 3 health areas in 3 regions of Spain. People who received prescriptions for the International Classification of Diseases 9th edition (ICD-9) diagnostic codes 278, 278.00, 278.0, 278.01, and v77.8 from December 2023 to November 2024 were selected, regardless of whether the prescriptions were reimbursed by the Public Health System or out of pocket. Gender, age, weight, body mass index, income category according to the public health insurance card, number of prescriptions, and treatment received were described for all patients
Results: At the time of the interim analysis, 7,109 individuals had received some form of pharmacological treatment for obesity. Among them, 5,175 (68.0%) were females and 2,434 (32.0%) males, with a mean age (standard deviation) of 56.1 (16.1) years. One in every four people belonged to the age group of 51-60 years, and 1.9% were aged below 18 years. The average weight of individuals who underwent anti-obesity treatment was 98.4 (22.1) kg, with males being almost 17.0 kg heavier than females, weighing 109.0 kg for males and 93.3 kg for females. The body mass index (BMI) was 36.6 (6.9), nearly equal between males and females. On average, each person received 4.2 prescriptions during the study period, with a slightly higher number for males (4.4) than for females (4.1). According to their public health insurance cards, 1,283 (16.9%) are people considered socially vulnerable, 1,947 (25.9%) are retirees, and 2,253 (29.6%) are workers with incomes below 18,000 euros.
Conclusions: A woman aged between 51-60 years with a weight of 98.4 kg and a BMI of 36.6 is the profile of the person who was prescribed anti-obesity pharmacological treatment during 2024 in Spain.

PO4.315

How has GLP-1 receptor agonist treatment changed medical nutrition therapy? a quantitative survey of registered dietitians in switzerland

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Introduction: GLP-1 receptor agonists (GLP-1 RAs) offer significant advancements in obesity treatment, enabling up to 15% weight loss without surgery. Since March 2024, Switzerland is one of the few countries worldwide to fully reimburse GLP-1 RA treatment (Semaglutide) under mandatory health insurance for individuals with BMI ≥35 kg/m² or BMI ≥28 kg/m² with comorbidities. Concomitant medical nutrition therapy (MNT) is mandatory. This has altered referral volumes, interventions, delivery methods and interdisciplinary roles. However, no uniform approach or recommendations for MNT content or delivery during GLP-1 RA treatment currently exist. These shifts in the obesity landscape and their impact on outcomes remain unexplored.
Methods: A quantitative survey targeting dietitians with ≥6 months of experience in obesity MNT with GLP-1 RA treatment is being conducted in the German-speaking part of Switzerland. Convenience sampling was

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used; dietitians in obesity centers were contacted via email, and others were invited through the Swiss Association of Registered Dietitians. The survey, primarily multiple-choice, explores changes in referral volumes, MNT content, therapy outcomes, and interdisciplinary collaboration. Open questions capture challenges and opportunities in combining therapies. Pretesting on an obesity-specialist dietitian was used to ensure questionnaire clarity.

Results: Although final results will be available in March/April 2025, pretest feedback highlights emerging client needs in GLP-1 RA treatment. Clients may fear withdrawal from therapy if weight-loss milestones (5–7% in 4 months, 10–12% in 10 months) are unmet or when reimbursement ends after three years. These fears may lead to "quick fix" dieting before milestone checks. Some clients inject higher doses of GLP-1 RAs than prescribed and consequently eat almost nothing. Undiagnosed binge eating disorder may go unnoticed, preventing therapy continuation due to slower weight loss, despite clients feeling more in control around food for perhaps the first time. Clients may not see the need to address the psychological drivers behind their behaviors, relying on the medication as the only solution to their weight loss. Emphasis on protein intake to prevent muscle loss and addressing side effects can overshadow the need for long-term healthier eating and exercise habits. Interdisciplinary roles and delivery methods are also shifting. Increased referrals have led some obesity centers to delegate group education on some GLP-1 RA topics to medical office assistants or nurses, reserving dietitians for individual counseling on sustainable behavior changes. Outside obesity centers, GLP-1 RA clients may see generalist dietitians, as specialist expertise is not required by prescription criteria.

Conclusion: GLP-1 RA treatment is transforming MNT for obesity. The findings will help to inform clinical practice, potentially guiding the development of standardized, effective approaches to MNT and GLP-1 RA treatment. It may offer new interdisciplinary care models, thereby improving the patient journey and the obesity therapy pathway as a whole.

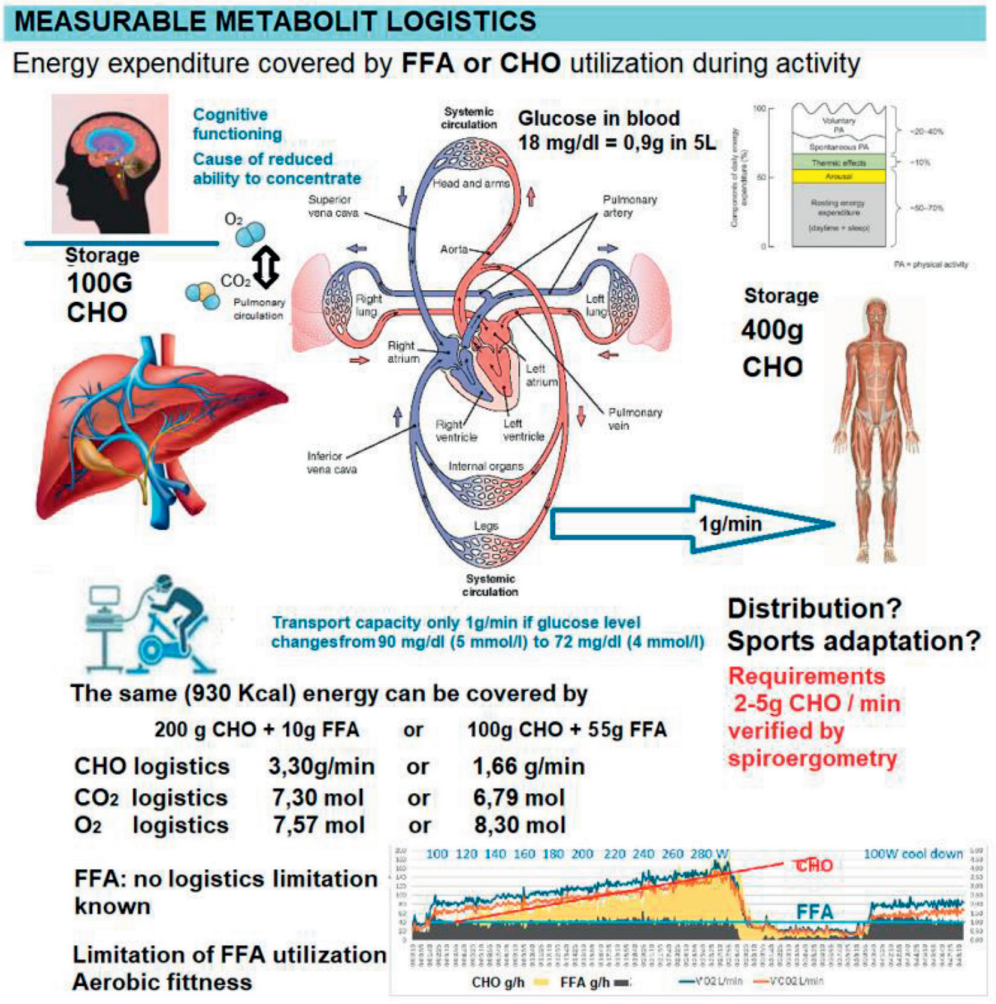
PO4.316

Spiroergometric technique advantages in maintaning adequate skeletal muscle functioning in patients living with severe obesity

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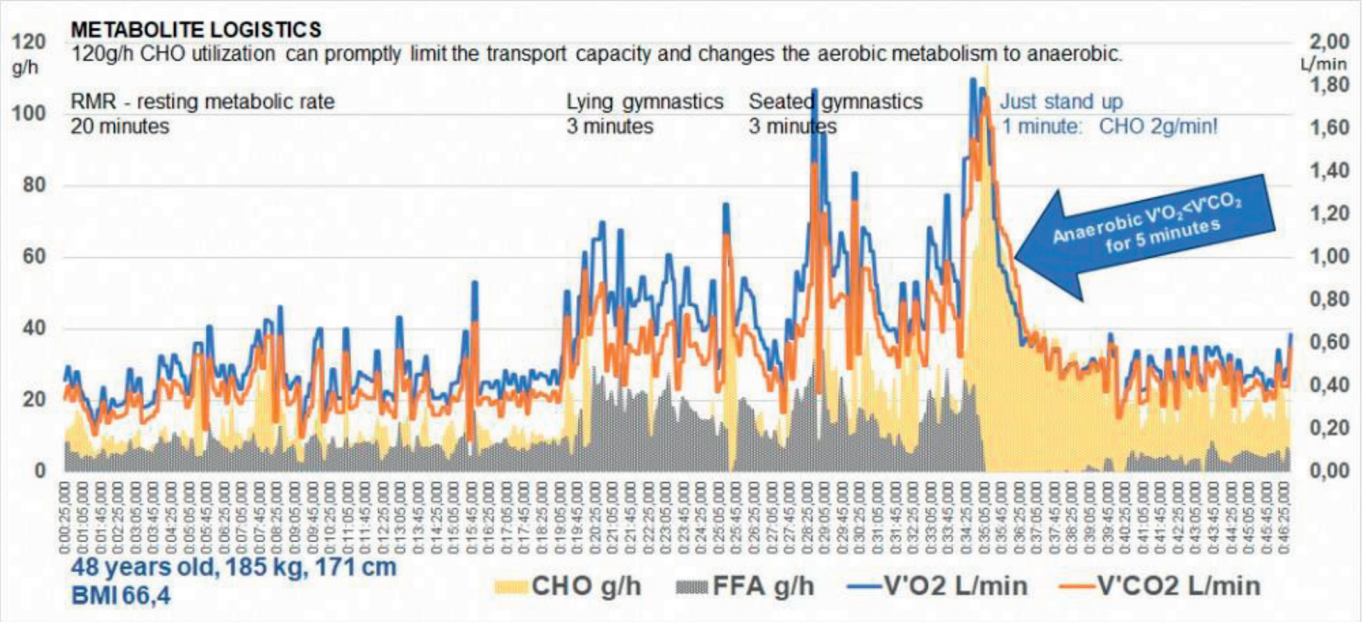
Introduction: By adapting spiroergometry (CPET) in a metabolic direction, it is possible to determine whether energy production happens from free fatty acids (FFA) or carbohydrates (CHO) during exercise. CPET can measure the V'O_2 used (L/min) and V'CO_2 produced (L/min).



During the measurement, the metabolite consumption and the by-product production can be dynamically measured. Based on the combination of techniques, the needs of target organs, i.e. skeletal muscles, brain can be calculated. If a critical logistical discrepancy occurs, it has a negative effect on FFA utilization.

Fig. 1. Circulation of metabolites and their relation to covering energy expenditure.

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The graph shows the consumed CHO or FFA per breath. The test is guided in such a way that the ratio of FFA utilization is as high as possible. In addition, the whole metabolism takes a critical turn in the 35th minute of the measurement, just for changing from seated to standing position.

Fig. 2. Metabolite logistics during individual spiroergometric measurements.

The difference between them indicates if the exercise is aerobic or anaerobic. In cases of unsuccessful weight management, we often encounter in our practice that high CHO utilization leads to delays in metabolite logistics or by-product elimination, which hinders FFA utilization.

Methods: CPET was performed in 10 patients living with obesity, with BMI 51.0-66.4. Anthropometric data were determined, and in addition to respiratory function, obstructive sleep apnoea syndrome (OSAS) screening, musculoskeletal, lifestyle and dietary assessments were performed. Exercise necessary for lifestyle change was proposed using spiroergometry. Their training consisted of: 20 minutes measurement of resting metabolic rate (RMR), a set of exercises allowed by their own physical ability, and 20 minutes recovery. FFA and CHO utilization was measured in stages. Individual gymnastics was measured in lying, sitting and standing positions with yoga-like movements, and the rests between movements were adjusted to the maximum FFA utilization, based on breath-by-breath measurement technology.

Results: The rate of FFA utilization for energy production was maximised when the movements were performed with reduced load, in a lying or sitting position, sparing the injured limb. When a sensation of respiratory distress occurred, in the case of suddenly increased load, it promptly reduced FFA utilization, which could only be improved by a resting phase. During the whole measurement, the FFA utilization was 61+/-11% with the above guided gymnastics, but the sustainability of this was only 8-12 minutes, as illustrated in the figure. Higher CHO utilization during higher intensity exercise phase was accompanied by a consistent rise in insulin and was followed by lower venous partial O2 pressure. By-product elimination time correlates with CHO/FFA utilization ratio, based on blood gas results. With a lower FFA ratio, recovery time was longer, up to 10-12 min after a short exercise, indicating a decrease in blood pH related to fatigue and anaerobic exercise according to $V'O_2<V'CO_2$. During OSAS screening, 9 out of 10 cases showed a clearly high AHI index, CPAP treatment was initiated.

Conclusions: In cases of high BMI, conventional exercise routines cannot be applied. On the one hand, because of co-morbidities and the need for a multidisciplinary treatment plan. On the other hand, the increased oxygen and metabolite demand and prolonged by-product elimination caused by extreme extra weight must be considered. So, phasing daily activity, bridging it with rest periods, is a stepping stone to maintain resting FFA use. Instrumental management of OSAS, administration of GLP-1a (+GIP) based on BMI is required. A weight loss target of 18-25 kg per year (13-18000 Kcal per month) and the performance-adaptive and intermittent exercise technique also seem to be effective in avoiding sarcopenic obesity in this group.

PO4.317

Personalization of the Dutch combined lifestyle intervention SLIMMER improves retention and results in additional weight-loss in people at risk for cardiometabolic disease or living with obesity

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Introduction: Since January 2019 the combined lifestyle intervention (CLI) SLIMMER is part of reimbursed healthcare within the Netherlands, because this cost-effective two-years CLI showed moderate weight loss (-2.8 kg), improved quality of life with 7.5 points and reduced 47% incidence of type 2 diabetes. However, drop-out rates are 50%. Personalization, i.e. adapting lifestyle advice to individual needs and preferences, may lead to better adherence. We investigated a personalized version of the SLIMMER CLI, for effects on weight loss, metabolism and lifestyle advice adherence and explored individual drivers for these effects.

Methods: In this cluster-allocated open-label parallel intervention study, 61 participants were included in the personalized SLIMMER CLI and 60

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participants in the comparison group who followed the regular SLIMMER intervention. Adults who were overweight and at risk for cardiometabolic disease or adults living with obesity were included and followed during the first 6 months of the SLIMMER CLI. Body composition and plasma clinical chemistry were measured at baseline and end of study. Adherence to lifestyle advice was assessed by qualitative questionnaires on self-reported adherence, self-efficacy and maintenance to diet and physical activity advices as well as by evaluation of drop-out rates. Within the intervention group only, individual drivers of weight loss and metabolic effects were investigated by evaluation of postprandial metabolic measurements and continuous monitoring data from the activity tracker.
Results: At 6 months, body weight (-4.5 kg, $p < 0.001$), BMI (-1.5 kg/m^2, $p < 0.001$) and body fat percentage (-3.5%, $p < 0.001$) significantly improved to a larger extent in the personalized intervention group versus the comparison group. The drop-out rate was significantly lower in the intervention (11%) than comparison group (26%, $p < 0.001$). No consistent difference was found in outcomes related to lifestyle advice adherence between groups. Metabolic improvements within the intervention group were only observed in persons with prediabetes (p=0.014) and not in persons with normoglycemia (p=0.110) at baseline. Estimated mean resting heart rate (RHR) correlated moderately with weight loss (ρ=0.53, p<0.01).
Conclusion: Personalization of the SLIMMER CLI improved body weight, BMI, body fat percentage and retention rate to a greater extent than the regular SLIMMER CLI. This was not explained by differences in qualitative measurements related to self-reported adherence, self-efficacy and maintenance for lifestyle advice. Finally, RHR positively correlated with weight loss, suggesting that participants with a higher fitness level achieved more weight loss. Metabolic improvement as a result of the achieved weight loss was only observed in persons with prediabetes.

Conflict of Interest: None disclosed;

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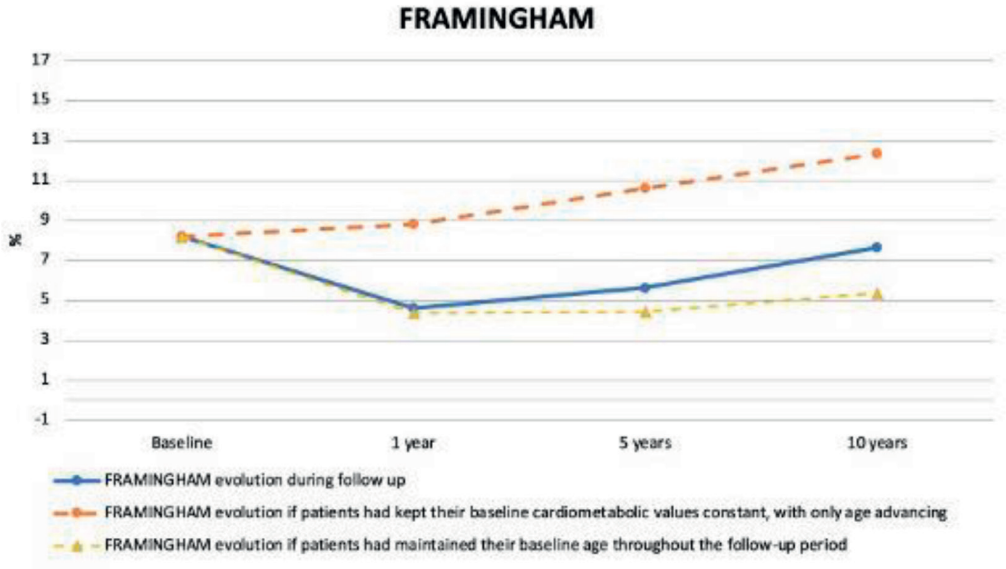
PO4.318

Long-Term Cardiovascular Risk Evolution Through Bariatric Surgery: Insights from a Mediterranean Population Over 10 Years

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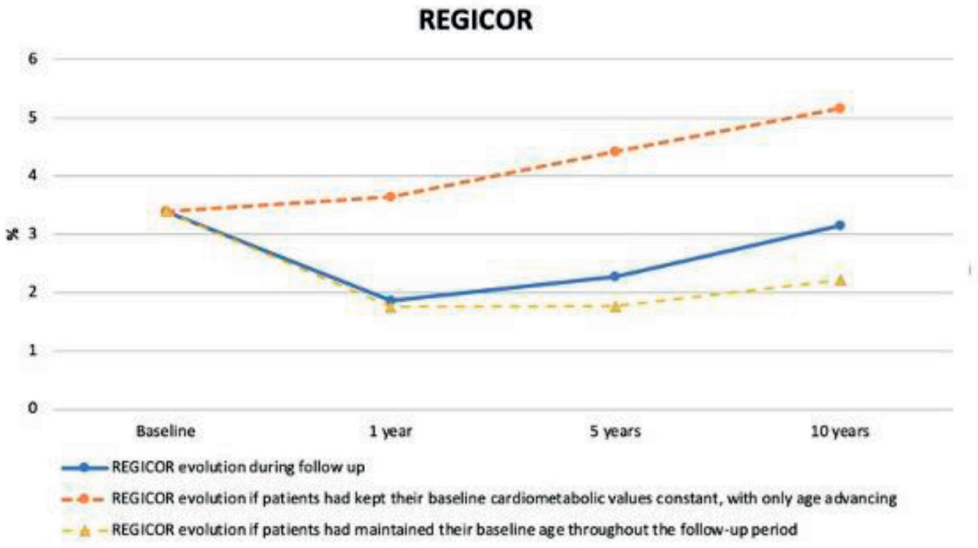
Introduction: Limited information is available regarding the long-term evolution of estimated cardiovascular risk (CVR) following bariatric surgery and whether different surgical techniques, such as laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB), lead to different outcomes. This study aimed to evaluate the impact of bariatric surgery on CVR over 1, 5, and 10 years in a Mediterranean population using different risk estimation formulas, and to analyze potential differences between LSG and LRYGB.
Methods: This retrospective study included 128 patients who underwent bariatric surgery at Hospital del Mar in Barcelona (Spain) between 2004 and 2012, with a follow-up of 10 years. CVR was estimated at baseline, 1, 5, and 10 years using Framingham risk score (FRS), Registre Gironí del Cor (REGICOR), SCORE, and SCORE2. Simulations were performed to evaluate the influence of aging on CVR scores independently



The graphic shows the evolution of FRAMINGHAM during follow up, FRAMINGHAM evolution if patients had kept their baseline cardiometabolic values constant, with only age advancing and FRAMINGHAM evolution if patients had maintained their baseline age throughout the follow-up period.

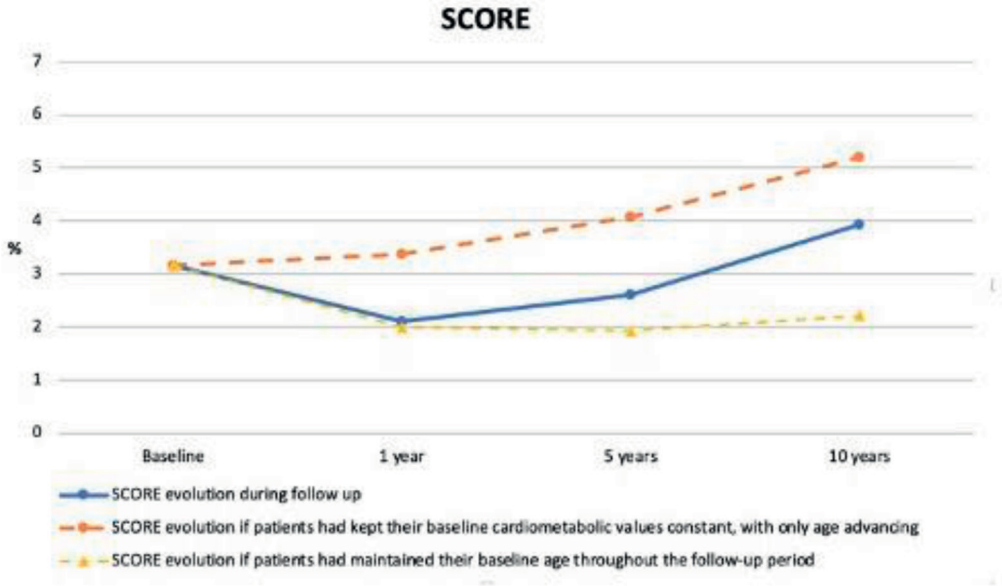
Fig. 1. FRAMINGHAM Evolution.

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The graphic shows the evolution of REGICOR during follow up, REGICOR evolution if patients had kept their baseline cardiometabolic values constant, with only age advancing and REGICOR evolution if patients had maintained their baseline age throughout the follow-up period.

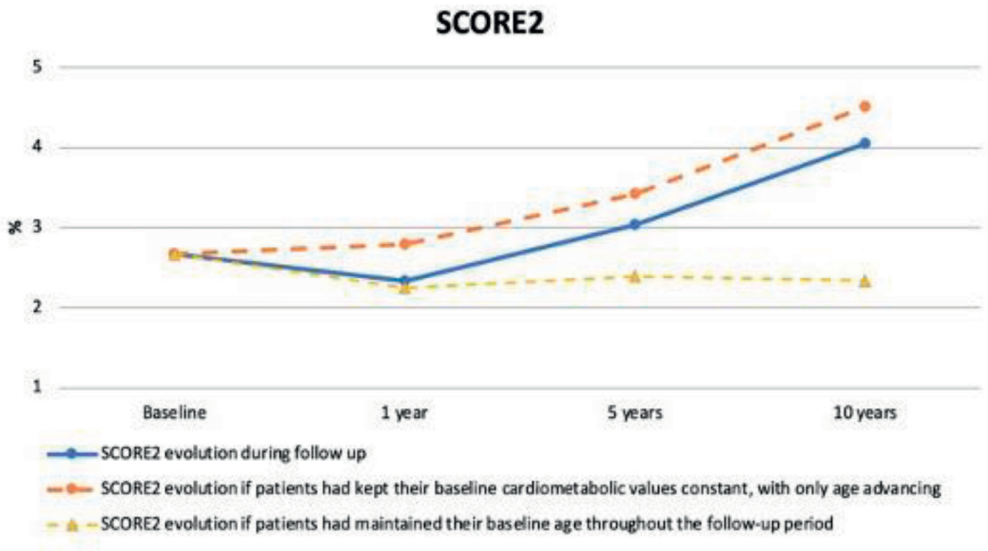
Fig. 2. REGICOR Evolution.



The graphic shows the evolution of SCORE during follow up, SCORE evolution if patients had kept their baseline cardiometabolic values constant, with only age advancing and SCORE evolution if patients had maintained their baseline age throughout the follow-up period.

Fig. 3. SCORE evolution.

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The graphic shows the evolution of SCORE2 during follow up, SCORE2 evolution if patients had kept their baseline cardiometabolic values constant, with only age advancing and SCORE2 evolution if patients had maintained their baseline age throughout the follow-up period.

Fig. 4. SCORE2 evolution.

of cardiometabolic changes. Repeated measures ANOVA was used to analyze the evolution of the scores over time.

Results: The cohort included 86.7% women, with a mean age of 48.8 ± 8.0 years and a baseline BMI of 44.4 ± 4.8 kg/m². Laparoscopic Roux-en-Y gastric bypass (LRYGB) was performed in 60.9% of patients. A global improvement was observed in cardiometabolic parameters included in the formulas, except for HDL cholesterol, which did not improve with LSG. At 12 months, estimated CVR values showed significant reductions: from 8.07% ± 1.19 to 4.50% ± 0.68 with the Framingham Risk Score ($p<0.001$), from 3.33 ± 0.52 to 1.82 ± 0.35 with the REGICOR score ($p<0.001$), from 3.10% ± 0.41 to 2.08% ± 0.33% with the SCORE model ($p<0.001$), and from 2.67% ± 0.28 to 2.33% ± 0.24 with SCORE2 ($p<0.001$). At 10 years, FRS and REGICOR returned to values not significantly different from baseline (FRS: 7.62% ± 1.26, $p=0.532$; REGICOR: 3.15 ± 0.6, $p=0.614$). In contrast, SCORE and SCORE2 worsened beyond baseline levels at 10 years (SCORE: 3.93% ± 0.55, $p<0.001$; SCORE2: 4.05% ± 0.4, $p<0.001$). Simulations indicated that age was a key factor in the long-term worsening of CVR scores. SCORE2 decreased at 12 months only in the LRYGB group and not in the LSG group, remaining lower throughout the follow-up period in the LRYGB group ($p=0.013$).

Conclusion: This study showed a significant reduction in cardiovascular risk at one year, which was not maintained after ten years, although the long-term outcomes showed a better evolution of the scores compared to what would be expected without surgery. SCORE2 detected a more favorable evolution after LRYGB that was not observed with other models. These differences are likely explained by the inclusion of non-HDL cholesterol in the SCORE2 calculation.

Conflict of Interest: None Disclosed.

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PO4.319

Dapagliflozin neutral on body weight when ministered to chronic kidney disease patients: A real-world retrospective study

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Mediterranean Diabetes and Obesity Clinics

Background: Dapagliflozin, a sodium-glucose cotransporter-2 (SGLT2) inhibitor, has an expanded spectrum of indications, beyond type 2 diabetes; chronic kidney disease (CKD) and heart failure are the most recent indications of dapagliflozin, irrespectively of the presence of diabetes. With this retrospective real-world study, we wanted to evaluate the effect of dapagliflozin on body weight in SGLT-2 inhibitor naïve patients with CKD.

Methods: Patients' data were collected retrospectively from the database of Mediterranean Diabetes & Obesity Clinics. Baseline renal function (eGFR) was calculated by using the CKD-EPI formula (equation 2021) and urine albumin to creatinine ratio (UACR) was assessed in the first morning void.

Results: A total of 242 Caucasian adults (57% males) of mean age ± SD of 69.4±11.4 years with CKD were included in the study: 166 (69%) with type 2 diabetes (T2D), with mean T2D duration 11±4.7 years, and 76 (31%) without (non-T2D). Mean eGFR before daragliflozin initiation was at 51.4±11.3 ml/min/1.73m2. UACR greater than 30 mg/grCreat had 32.1±8.1% of subjects, of which 21.5±3.1 had greater than 300 mg/grCreat. Dapagliflozin significantly improved eGFR in both groups. Non-T2D participants showed an increase at 6.1% while T2D statistically greater at 13.6% ($p<0.001$). UACR was significantly reduced across both groups, without significant difference between groups ($p=0.52$). HbA1c ameliorated in both groups, but greater for the T2D group ($p<0.001$). Baseline mean body weight for all subjects 83.9±16.9 Kg was reduced at 83.2±14.2 at 12-month follow up ($p=0.34$) with no differences among groups.

Conclusion: This retrospective real-world study showed that dapagliflozin improved kidney function in CKD patients irrespectively of diabetes status. Body weight, though, remained interestingly unaffected in both T2D and non-T2D subjects, contra wise the results of large RCT's. This finding could possibly be attributed to metabolic adaptations following

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the glycosuria caused by dapagliflozin. Larger scale real world studies need to be conducted to have safer conclusions.

Conflict of Interest: The authors declare no conflicts of interest.

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PO4.320

High-protein ketogenic diet versus low-calorie, low-sodium, high-potassium mediterranean diet in patients with overweight/obesity and high-normal blood pressure or grade I hypertension

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Introduction: Diet therapy in patients with obesity or overweight and high-normal blood pressure or grade I hypertension with low-moderate cardiovascular risk should be used at least for the first three months. However, guidelines do not indicate which type of diet should be preferred. The aim of this study was to compare a high-protein Keto using commonly available natural foods versus a low-calorie, low-sodium, high potassium Mediterranean diet (MD), evaluating the effects on blood pressure, body weight, main biomarkers and bioelectrical impedance analysis (BIA).
Methods: Twenty-six non-diabetic patients (mean age 46±11.9), not in antihypertensive pharmacological treatments, were initiated, alternatively based on their preferences, 15 in KD and 11 in MD. Blood analysis, BIA (Imp DF50) and ambulatory blood pressure monitoring (Spacelabs devices model 902227) were carried out before and after three months of diet.
Results: At baseline there were not significant differences between the two groups. After three months of KD body weight decreased from 98.6 ± 13.0 to 87.3 ± 13.4 kg and after three months of MD decreased from 93.8 ± 17.7 to 86.1 ± 19.3 kg and waist circumference decreased as well. After KD 24h mean SBP decreased from 127.3 ± 9.9 to 118.3 ± 7.3 mmHg and 24h mean DBP from 81.2 ± 7.9 to 75.6 ± 5.8 mmHg; after MD 24h mean SBP decreased from 123.9 ± 13.2 to 113.1 ± 9.5 mmHg and 24h mean DBP from 77.2 ± 8.4 to 71 ± 6.6 mmHg. The Fat-Free Mass increased while the Fat Mass decreased. Blood lipids and insulinemia decreased as well. In all analyses, a p-value <0.05 showed statistically significance between baseline and after three months of diet but non-significant differences were observed between KD and MD treatment.
Conclusions: We did not observe significant differences between the two types of diet that were both very effective in improving many bio-anthropometric parameters and blood pressure. It is possible that some different effects between diets might emerge in larger studies. However, both types of diet appear to be effective in improving metabolic and cardiovascular health of patients living with overweight or obesity and higher BP.

PO4.321

Weight changes adversely affect markers of glycaemic control and insulin resistance in a South Asian and White European cohort living with obesity at high risk of type 2 diabetes

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Introduction: Weight gain can impact cardiometabolic health and increase the risk of chronic conditions linked to excess adiposity such as Type 2 Diabetes (T2D). The aim of this analysis was to investigate the ethnicity interaction (White European, South Asian) between changes in body weight and markers of glycaemia following Oral Glucose Tolerance Test (OGTT) in a cohort living with obesity at high risk (prediabetes) of T2D.
Methods: This analysis reports cohort data from the PROPELS (ISRCTN: 83465245) 3-arm randomised controlled trial which recruited people from primary care at high risk of T2D. Measures of weight and markers of glycaemia were obtained at Baseline, 1-year and 4-years across all randomised groups including demographic, medical characteristics and lifestyle behaviours. All three trial arms were analysed as a single cohort to investigate the ethnicity interaction between changes in body weight and changes in markers of glycaemia (2-hour post-prandial glucose and insulin, Homeostatic Model Assessment for Insulin Resistance (HOMA-IR) and Matsuda Index). Generalised estimating equation models adjusted for randomisation group, sex, age, occupation, deprivation, smoking status, statin or blood pressure medication status, baseline OGTT parameters and baseline bodyweight were used to analyse associations between change in bodyweight and changes in markers of glycaemia.
Results: 545 participants had ≥2 weight observations and formed the sub-cohort that undertook OGTT; 367 (48.6% female) were White European (WE) and 178 (42.8% female) were South Asian (SA). An ethnicity interaction was observed for 2-hour post-prandial glucose (p=.003), where each kilogram increase in weight was associated with a 0.2mmol/mol (95% CI: 0.1mmol/mol to 0.3mmol/mol) increase in 2-hour post-prandial glucose in SA compared to 0.1mmol/mol (0.04mmol/mol to 0.1mmol/mol) in WE, a 2.6pmol/l (0.5pmol/l to 4.7pmol/l) increase in 2-hour post-prandial insulin in SA compared to a 1.6pmol/l, (0.7pmol/l to 2.4pmol/l) in WE, a 0.03 (0.01 to 0.05) increase in HOMA-IR in SA compared to a 0.02 (0.01 to 0.03) in WE, and a -18.2 (-28.6 to -7.8) decrease in Matsuda Index in SA compared to a -14.6 (-24.6 to -4.6) in WE. Associations were linear in each model.
Conclusion: Weight increase had a greater adverse impact in 2-hour post-prandial glucose and insulin during OGTT, HOMA-IR, Matsuda Index in SA compared to WE ethnic groups living with obesity. These results highlight the need for a personalised and targeted approach for T2D prevention in high risk populations including interventions targeting insulin resistance and post-prandial glucose in SAs.

Conflict of Interest: The authors declare no conflicts of interest related to this work.

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PO4.322

Variation of LDLox in Older Patients with Cardiovascular Disease with and without Obesity

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Introduction: Obesity is considered an independent risk factor for atherosclerosis due to its association with oxidative stress and inflammation. Abdominal fat accumulation, which can be indirectly measured by waist circumference, is an important risk factor for the development of coronary artery disease.
This is due to its association with a number of metabolic disorders such as diabetes mellitus, hypertension and dyslipidemia. Both altered lipoprotein composition and levels are likely related to the higher risk of cardiovascular disease associated with obesity.
Methods: The aim of this study was to evaluate the susceptibility of low density lipoproteins (LDL) to lipid peroxidation (LDLox) in two study groups of older patients (64 ± 11 years): a group of patients with cardiovascular disease and a group of patients with cardiovascular disease associated with obesity. The LDL susceptibility to in vitro induced lipid peroxidation

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was evaluated following its incubation with a prooxidant system. The end products of lipid peroxidation were assessed by reaction with TBA.
Results: The results obtained show an increase in LDLox susceptibility in obese patients, compared to the group showing only cardiovascular disease (6.58 ± 0.88 vs 5.70 ± 0.99 mmol MDA / dl serum, p = 0.005).
Conclusion: A possible explanation for the relationship between LDLox and obesity is that oxidized lipoproteins may be associated with increased adipose tissue. This is in agreement with experimental evidence, in which LDLox induces adipocyte proliferation either directly or indirectly, by increasing the infiltration of inflammatory monocytes/macrophages leading to increased adipogenesis.

PO4.323

Perception and Stigmatization of Participants with Obesity

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Introduction: Obesity is a multifactorial condition extending beyond biological concerns to encompass psychological and social dimensions. Weight-related stigma remains a significant barrier to care and adherence. This study examines patients' with obesity perceptions of their condition and the stigma they face. The objectives are to analyze patients' health and body image perceptions, identify common types of stigma, and explore correlations between these perceptions, stigma experiences, and demographic or clinical data.
Methods: This study involved 60 patients with obesity from a cohort of 112 identified candidates. Participants completed a standardized questionnaire addressing self-perception (body satisfaction scale), stigma experiences in social, medical, and professional contexts, and psychosocial impacts (anxiety and depression). Clinical data, including BMI, medical history, and socioeconomic status, were analyzed to model the interactions between obesity, stigma, and mental health. This approach underscores the necessity of integrating psychosocial and societal aspects into clinical obesity management.
Results: Seventy percent of patients expressed dissatisfaction with their body image, a sentiment strongly associated with a BMI ≥ 40 kg/m². Social stigma was reported by 75% of participants, medical stigma by 63%, and workplace stigma by 40% of employed patients. Psychosocial consequences were significant, with 68% of participants exhibiting high anxiety levels and 55% reporting moderate to severe depressive symptoms. Notably, stigma strongly correlated with reduced treatment adherence ($p < 0.05$).
Conclusion: This study demonstrates the pervasive stigma surrounding obesity and its detrimental effects on patients' psychological and metabolic health. The findings highlight the need for a multidisciplinary approach that prioritizes reducing stigma and enhancing psychological and educational support for persons with obesity.

PO4.324

Morphofunctional assessment in patients with obesity treated with semaglutide 2.4 mg

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Introduction: Obesity is a complex disease with metabolic and functional health implications. Morphofunctional assessment techniques (MFA) enable the analysis of body composition and functional status, playing a key role in monitoring GLP-1 treatments.
Objectives: To describe body composition and muscle function in patients with obesity treated with semaglutide 2.4 mg using MFA.
Materials-Methods: Cross-sectional study in patients with obesity at the Obesity Unit of Hospital Quirónsalud Málaga. Bioelectrical impedance vector analysis (BIVA), nutritional ultrasound® (NU), and functional tests were performed. Correlations between parameters were analyzed, and t-tests and linear regression were used to identify significant predictors.
Results: The study included 71 patients with obesity (78.9% women, age 45±10 years, BMI 34.2±5.3 kg/m²). AACE scale found 2.9% Grade 0, 47.1% Grade 1 and 50% Grade 2.
Waist and hip circumferences of 106±13.6 vs 121±14 and 121±13.7 vs 116±11.3 cm.
BIVA results highlighted FM (%) (39.9±11.6 vs. 38±12.7), FFM (kg) (50.3±5.6 vs 69.2±9.3), ASMM (kg) (20.1±2.8 vs 28.2±3.4), and PhA (°) (5.99±0.6 vs 6.39±0.8).
NU showed RF-CSA (cm²) (5±1.1 vs 6.49±1.7), L-SAT (cm) (2.14±0.7 vs 1.28±0.4), and T-SAT (cm) (3.18±1.5 vs 2.56±1.5) for women and men, respectively.
No differences were observed in visceral fat area (cm²) between sexes (9.1±3.1).
Muscle function was measured using HGS (kg) (22.1±5.1 vs 38±6.9) and the squat test (repetitions) (19.9±5.8, no differences between sexes).
Significant correlations ($p<0.05$) included:

- FM with hip circumference and L-SAT (r=0.8 and 0.55), FFM with calf circumference (r=0.56).
- RF-CSA with BCM and ASMM (r=0.7 and 0.7).
- HGS with FFM and RF-CSA (r=0.75 and 0.51), and squat test with PhA (r=0.57).

Linear regression showed that calf circumference, HGS, squat test, and RF-CSA explained 78% of the variability in FFM ($p<0.001$).
Conclusion: MFA techniques are essential tools for assessing body composition and functionality in patients with obesity treated with semaglutide 2.4 mg.

PO4.325

Obesity and older age were associated with the onset of posttransplantation diabetes in Korea: A Nationwide Population-Based Study

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Background: Post-transplantation diabetes mellitus (PTDM) remains a leading complication after solid organ transplantation, and is a risk factor for graft failure, cardiovascular disease, and patient mortality. We investigated the risk of new onset diabetes in patients with organ transplation in a large-scale population using nationwide data in Korea.
Methods: Using the Korean National Health Insurance Service database, recipients of kidney, liver, heart, or lung between 2005 and 2020 were identified. The incidence of development of diabetes and the risk factors for developing PTDM in organ transplant recipients. PTDM was diagnosed according to the American Diabetic Association/WHO criteria, or a requirement for insulin, an oral hypoglycemic agent, or both. Patients who developed diabetes within a year after transplantation were excluded from the study.
Results: A total of 1,981 adult recipients without diabetes, or cardiovascular disease were included. During the median follow-up of 7.5 years, PTDM developed 50.8% subjects (n= 1,007) who fulfilled the inclusion criteria after transplantation. A higher baseline BMI (≥25 kg/m²) and older age (≥45 years) at transplantation were associated with the development of PTDM after adjusting confounding factors. Adjusted hazard ratios (95% CI) were 1.33 (1.14–1.53) and 1.18 (1.02–1.37), respectively. However, sex, smoking status, amount of alcohol intake, regular exercise, hypertension, dyslipidemia, household income, and the transplanted organ type had no significant impact on the development of PTDM.
CONCLUSION Obesity and older age at transplantation seem to be the main risk factors for the development of PTDM. Weight control at the time of transplantation would be important for the prevention of PTDM

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Tab. 1. Multivariate analysis of the development of PTDM.

	No.of patients	No.of events	DURATION	Rate	HR	95% CI	95% CI	P value
	Non-diabetes	Diabetes						
BMI								
<25	1329	645	7702.81	83.74	1(Ref.)			
≥25	463	250	2136.21	117.03	1.34	1.15	1.55	0.0001
Age								
<45	511	255	3314.80	76.93	1(Ref.)			
≥45	1281	640	6524.22	98.10	1.26	1.08	1.47	0.0035

PO4.326

The low energy diet – an intensive lifestyle intervention for T2D remission in early onset type 2 diabetes

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Low energy diets (800-900kcal/day) (LED), aside for bariatric surgery, remain the most viable non-pharmacological treatment option for Type 2 Diabetes (T2D) remission (achieving good glycaemic control without the support of medication) which is a patient and health system priority. LED work to induce significant and rapid weight loss of 10-15% of baseline bodyweight over 3-5 months and enjoy at least equal or superior acceptability to more established modest energy restriction diets. LED can be given continuously or intermittently (interrupting the diet to give patients relief on selected days of the week), using meal replacement products or a whole-foods based approach. LED efficacy exists in primary and secondary care and has been implemented through 1-to-1 counselling, group and digital intervention settings.

There are additional considerations which need to be taken into account when attempting weight loss through LED, or indeed through pharmacotherapy or bariatric surgery. Concurrent physical activity or nutrient supplementation can support retain muscle mass and bone mineral density and protect physical function and strength. There are additional clinical risk mitigation measures which need to be considered, such as the down-titration of blood glucose and blood pressure medication when initiating LED, and careful screening against co-morbidities which act as contra-indications to LED.

This talk, part of a larger Multi-Disciplinary Team session on treating obesity and early-onset T2D, will explore how LED can complement the emerging treatment landscape for obesity and offer a practical food-based approach to effectively reduce risk of T2D diagnosis or cause T2D remission in a young adult cohort.

This talk will use clinical and research case studies to illustrate the physiological (using Dual-Energy X-ray Absorptiometry and ultrasound imagery) and metabolic (using results of mixed meal tolerance tests and continuous glucose monitoring) changes that occur when undertaking a lifestyle programme of intensive weight loss in young people. These case studies will then link back to the broader emerging evidence base that shows how early aggressive and proactive treatment of obesity and early-onset T2D could reduce future risk of adverse outcomes.

Conflicts of interest: None.

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PO4.327

Association Between *Triglyceride-Glucose Index (TyG)* and Body Composition Indices: Evidence From a Real-World Clinical Cohort

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Introduction: The triglyceride-glucose (TyG) index is a validated and reliable marker of insulin resistance. While most studies have explored its relationship with simple anthropometric measures like BMI and waist circumference—particularly in the context of type 2 diabetes (T2D)—the role of detailed body composition parameters remains less examined. BMI, although widely used in clinical practice, cannot differentiate between fat and lean mass, both of which critically influence metabolic health. This study evaluates the correlation between body composition indices and TyG, as well as their potential predictive value compared to BMI, in individuals with obesity but without T2D.

Methods: This cross-sectional study included 128 patients (73 females, 55 males) from a real-world clinical setting, with a mean age of 41 ± 10 years and a BMI of 35 ± 7 kg/m². Body composition indices were assessed using bioimpedance analysis and included body fat percentage (BFP, %), fat mass (FM, kg), fat mass index (FMI, kg/m²), fat-free mass (FFM, kg), fat-free mass index (FFMI, kg/m²), appendicular skeletal muscle (ASM, kg), and its index (ASMI, kg/m²). All variables were log-transformed for normalization. TyG was calculated as ln[fasting triglycerides (mg/dL) × fasting glucose (mg/dL) ÷ 2]. Statistical analyses included correlation and partial correlation (adjusting for age and gender) and multivariable linear regression (adjusting for BMI, age, and gender). Tests for multicollinearity ensured predictor independence and the robustness of results.

Results: Fat-derived indices BFP (R^2 = 0.208, β = 0.359, p = 0.000), VFR (R^2 = 0.202, β = 0.348, p = 0.000), and FMI (R^2 = 0.202, β = 0.303, p = 0.001) were more strongly associated with TyG than BMI (R^2 = 0.177, β = 0.239, p = 0.004). Among these, BFP explained the largest variance in TyG and had the strongest standardized beta coefficient. Muscle-related parameters, such as ASMI, showed weaker associations (R^2 = 0.162, β = 0.294, p = 0.014). Partial correlation analyses confirmed that BFP and VFR retained their significant relationships with TyG after adjusting for covariates. In multivariable models, BMI became non-significant when body composition indices were included, underscoring their superior predictive value.

Conclusion: In this real-life clinical cohort of patients with obesity, body composition indices, particularly BFP, VFR, and FMI, demonstrated stronger correlations and greater predictive capabilities for TyG than BMI. These findings underscore the importance of incorporating detailed body

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composition assessments alongside traditional anthropometric measures to enhance metabolic risk stratification. By integrating fat and muscle indices into routine obesity care, clinicians can improve diagnostic accuracy and support targeted interventions to mitigate metabolic complications.

PO4.328

Morphofunctional changes in the follow-up of obese patients treated with semaglutide 2.4mg

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Introduction: Obesity is a chronic metabolic disease that leads to multiple complications in the medium and long term. GLP-1 analogs, including Wegovy (Semaglutide) 2.4 mg, are the medical treatment that achieves significant and sustainable weight loss over time. Morphofunctional assessment (MFA) techniques, such as bioelectrical impedance with phase angle (BIA), nutritional ultrasound (NU)®, and handgrip strength (HGS) dynamometry, allow us to evaluate changes in body composition beyond the weight figure.
Objective: To evaluate the changes in body composition using MFA techniques in patients with obesity treated with Semaglutide 2.4mg.
Methods: Prospective study of patients with obesity attending the consultation at Hospital Quirónsalud Málaga. Morphofunctional data were assessed using all MFA techniques during the baseline visit and at 3 months of follow-up.
Results: The study included 35 patients, of whom 72% were women. Regarding comorbidity load, assessed using the AACE Scale: 2.9% patients presented grade 0, 47.1% patients grade 1, and 50% patients presented grade 2.
The most significant data on changes in body composition and muscle function are presented in Table 1.
Conclusions: Treatment with Semaglutide, along with a dietary program and physical activity recommendations, helps reduce weight, primarily at the expense of adipose tissue, without significant worsening of the muscular component.

Tab. 1. Changes in body composition and function.

	WOMEN		MEN		p
	Baseline	3 months	Baseline	3 months	
Weight (kg)	90,2±15,5	87,7±17,8	107±21	100±16,5	<0,001
Waist (cm)	106±13.6	105±17,2	121±14	112±9,1	<0,001
Hip (cm)	121±13,7	118±16,4	116±11,3	111±8,9	<0,001
Squat test (n)	19,9±5,9	22,3±5,11	20,7±4,6	23,7±2,25	<0,001
HGS (kg)	22,1±5,1	22,5±4,4	38±6,9	39,9±3,8	0,538
PhA (°)	5,9±0.65	5,8±0,45	6,4±0,79	6±0,79	0,048
BCM (kg)	27±3,61	26,1±3,5	38,3±5,44	36±3,2	<0,001
RFCSA (cm²)	5±1	5±1,1	6,5±1,7	6,1±1	0,511
RF-Yaxis (cm)	2±3,6	1,5±0,3	2,4±4,2	1,7±0,18	0,001
SAT area (cm²)	12,1±3,87	10,8±3,59	10,4±5,4	8,7±3,39	0,002
VAT area (cm²)	9±2,7	8,5±2,69	8,22±3,2	7,1±2,7	<0,001

Changes in body composition and function measure by MFA techniques, in female and male.

PO4.329

How patients with obesity use mobile health with a chat function in their obesity treatment - A cross-sectional study

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Background: Successful medical obesity treatment involves frequent follow-up contacts and individualized support from healthcare professionals. Some clinics have introduced mobile health, including chat applications where patients and healthcare professionals can exchange texts and documents. However, there has been limited evaluation of which patients in obesity treatment utilize chat functions and to what extent.
Methods: This was a cross-sectional study including n=492 Swedish speaking patients of 16 years of age or older, admitted to a specialist obesity treatment clinic in Sweden. We assessed the chat usage during the first 6 months of treatment, among different subgroups of participants, considering factors such as age, sex, Body Mass Index (BMI), socioeconomic status, and prescribed weight loss medications.
Results: The participants had a mean BMI of 42.5 (SD 6.6), with 73.4% being women, a mean age of 30.5 years, where 62% were aged between 16 and 25 years. Over 90% of participants had a low socioeconomic status and 23.8 % were prescribed weight loss medications.
Almost 90% of participants used the chat function during their first 6 months of treatment. Younger participants were significantly more active chat users ($p<0.005$), as were those prescribed weight loss medications ($p<0.001$) as well as those who received a digital welcome letter from healthcare professionals before admission ($p<0.001$). Socioeconomic status and sex did not appear to influence chat activity.
Conclusion: Integrating mobile health solutions, including a chat function, into obesity treatment programs can be an effective way to maintain patient contact, including for patients with low socioeconomic status. Healthcare provider-initiated digital interactions, such as sending a welcome message, may encourage greater patient engagement with the chat system.

PO4.330

Systemic Immune-Inflammatory and Response Indices as Quantitative Biomarkers for Obesity

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Introduction: Obesity is characterized by systemic inflammation and immune dysregulation, which contribute to metabolic syndrome, cardiovascular disease, and other complications [1, 2]. Emerging biomarkers such as the Systemic Immune-Inflammation Index (SII) and Systemic Inflammatory Response Index (SIRI) provide integrated measures of inflammation [2, 3]. We explored the application of SII and SIRI as quantitative tools for measuring inflammatory burden in obesity, disease progression, and links of obesity-related comorbidities to inflammatory processes.
Methods: Synthesis draws from population-based studies and clinical research, including NHANES data from 11,192 adults (2011–2018) and 7,645 adults (2017–2020) [2, 3]. It analyzes relationships between these indices and markers of obesity, such as BMI, waist circumference, and fat distribution. Nonlinear associations were assessed using smoothing curves and threshold-effect models, with stratified analyses highlighting subgroup variations.
Results: SII demonstrated a significant positive correlation with obesity prevalence, BMI ($\beta = 3.13$, 95% CI: 2.10–4.16), and waist circumference ($\beta = 7.81$, 95% CI: 5.50–10.13) in US adults [2]. In children, higher SII

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and SIRI values were observed in the group of people living with (mean SII: 528.83 ± 285.46; mean SIRI: 1.12 ± 0.79), with both indices positively associated with BMI ($p < 0.0001$) [4]. SII was also linked to fat tissue distribution patterns, particularly in females and individuals living with non-alcoholic fatty liver disease [3]. Stratified analyses showed physical activity modified the correlation between SII and obesity [2]. SII and SIRI exhibit nonlinear associations with BMI, with a higher rate of increase observed at BMI levels above 30.

Conclusion: SII and SIRI are promising biomarkers for quantifying obesity-related inflammation. Additionally, these indices could serve as the foundation for deriving a Systemic Obesity Immune Inflammation Index (SOI) tailored explicitly to obesity-driven systemic low-grade inflammation. Future research should prioritize validating SOI and exploring its potential to enhance precision in diagnosing and managing obesity-related health risks within clinical and public health frameworks.

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PO4.331

Expert views on the main challenges and opportunities for the future of childhood obesity prevention and treatment: a qualitative interview study

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Introduction: The rapidly increasing rates of childhood obesity in Europe over the last decades call for action but there are different views on the right path forward. The range of medical, social and behavioral interventions and policy changes to lower obesity rates is diverse and their effectiveness often uncertain. Moreover, they come with important ethical, legal and social challenges. For example, identifying high-risk groups and weight and exercise monitoring can be stigmatizing for children and their families and using obesity medication during childhood can have long-term effects. An overview of the main challenges ahead and their possible solutions is critical to set the agenda for better childhood obesity prevention and treatment in the future. This study provides this overview by gathering international expert advice from researchers, clinicians and policymakers.

Methods: Purposive sampling was used to internationally recruit researchers, clinicians and policymakers with an expertise on childhood obesity prevention and/or treatment. Interviews were held in English or French and in person or online until November 2024. Data were analyzed and synthesized using qualitative content analysis.

Results: There were 31 semi-structured interviews held with international experts from academia, clinical care, governments and international health organizations. The key challenges that were identified include stigmatization of children with obesity, overreliance on health promotion to turn the tide for increasing obesity rates, affordability and accessibility of medical care, uncertainty around the effectiveness of interventions, the focus on short-term intervention effects and short-term research funding. Suggestions for future action include the separation of general health promotion from care for children with obesity, better targeted medical interventions (based on biological measures), monitoring the long-term effectiveness of interventions and their and adverse effects (e.g. risk of stigmatization) and providing funding for long-term research.

Conclusion: The overview of challenges and opportunities ahead brings together critical research, clinical and policy perspectives to allow a well-considered agenda setting for the future of childhood obesity prevention and treatment.

PO4.332

Achieving Type 2 Diabetes Remission Through Structured Weight Management: Insights from a Randomized Controlled Trial

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Introduction: Type 2 diabetes (T2DM) is a growing global health challenge. The UK DiRECT trial showed that remission of early T2DM is achievable through a structured weight management program with total diet replacement (TDR). This study evaluated the efficacy of a primary care-based TDR program in achieving T2DM remission among Asians with obesity and early T2DM.

Methods: A randomized controlled trial in 4 primary care clinics in Singapore recruited adults aged 21–60 years, with T2DM for ≤5 years and BMI 27–45 kg/m². The intervention group participated in a dietitian-led weight management program with 12-week very low-calorie diet (VLCD) including TDR followed by incremental caloric intake and physical activity over another 12 weeks. The control group received usual care without VLCD or TDR.

Outcomes of weight loss, T2DM remission and blood pressure control were assessed at 6 months using an intention-to-treat approach.

Results: 57 participants recruited from December 2022 to January 2024 were randomized to intervention group (n=31) and control group (n=26). Their mean age was 45 years (SD 2), mean T2DM duration was 2 years (SD 1.5), 72% were of Chinese, 12% Malay, and 5% Indian ethnicity. There were 4 dropouts, all from the intervention arm.

At 6 months, whilst average weight loss was significantly higher in the intervention group compared to controls [6.7kg (SD 6.0) vs 1.4kg (SD 3.6), p=0.0003], only 22.2% of the intervention group achieved the target weight loss of 15kg or 15% baseline body weight. Nevertheless, intervention group participants were more likely to be in remission compared to control group (77.8% vs 15.4%; RR 5.06 (95% CI: 2.01–12.73). and more likely to have blood pressure <140/90mmHg without antihypertensive compared to controls (88.9% vs 42.2%, RR 2.10 95% CI 1.32 to 3.36).

Conclusion: A dietitian-led weight management program incorporating VLCD and TDR was effective in achieving weight loss, T2DM remission and improving blood pressure control within 6 months in people living with obesity and T2DM. T2DM remission and improved blood pressure was attainable at 6 months with weight loss <15kg or <15% baseline body weight. This structured weight management program has potential as a practical primary care intervention for people living with obesity and early T2DM.

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PO4.333

Participant Profile and Process Outcomes of a Multidisciplinary Specialist Weight Management Programme in Southeast London

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Introduction: Approximately 64% of UK adults live with excess weight. Prevalence rates are greater among ethnically diverse and socioeconomically deprived communities. Tier 3 behaviour change and weight management programmes (BCWMP) are part of the National Health Service 4-tier model of care for obesity. This service evaluation describes the participant cohort profile and process outcomes for a Tier 3 multidisciplinary specialist BCWMP delivered in Southeast London (SELT3).
Methods: SELT3 is a community-based specialist BCWMP. Adult patients are referred from Primary Care. Programme eligibility includes BMI >35 kg/m2 with type 2 diabetes or a ≥BMI 40 kg/m2 with prediabetes. The programme has two treatment pathways: a diet and lifestyle behavioural change intervention (Balance) or a 3-month total meal replacement (800-1200 kcal/d) followed by a diet and lifestyle behavioural change programme (Fast). Each pathway has 12-group sessions delivered over 12-months as either virtual or face-to-face sessions. Demographic and clinical data was collected at baseline (2018-2022). Validated questionnaires were used to assess eating and exercise behaviours. Data is reported as means ± SD and statistical significance is considered $p<0.05$.
Results: 3363 participants were enrolled; 2103 in Balance and 1260 in Fast. The cohort was predominantly female (78%), white (47%) and black African/Caribbean (36%) and the average age was 47 ± 13.5 years. 49% live in areas of high deprivation. The cohort was hypertensive (mean 133/83 mmHg), 35% had type 2 diabetes and 16% prediabetes. At baseline weight was similar across groups (Balance 124.0 ± 20.5 kg vs Fast 124.8 ± 21.5 kg, $p=0.285$) participants in the Balance intervention had greater prevalence of disordered eating including eating when anxious, lonely and blue (all $p<0.005$) and a doubled prevalence of binge eating disorder (14% vs 7%, $p<0.001$, Balance vs Fast respectively). Balance participants were more physically inactive ($p<0.001$). Although motivation and confidence to lose weight was high in both groups, participants of Balance were less motivated to and less confident in their ability to lose weight (both $p<0.001$). Early engagement was 67% and 61% for session 1 and 2 respectively and by session 4 engagement was <50% with a sustained reduction across the programme. Programme completion differed by ethnicity ($X2=7.422$, df(2), $p=0.024$), sex ($X2=8.1$, df(1), $p=0.004$) but did not differ by deprivation ($X2=2.06$, df(2), $p=0.352$).
Conclusion: SELT3 successfully engaged ethnically diverse and socioeconomically disadvantaged communities where obesity prevalence rates are higher. Those with higher confidence and activity levels, and without disordered eating were more likely to opt for the total meal replacement intervention. These differences should inform programme development and tailoring of content to participant needs. Strategies to improve long-term engagement, particularly among groups with lower completion rates should be prioritised. Given that completion rates did not differ by deprivation, the programme has potential to address health inequalities in obesity.

PO4.334

Findings from the introduction of genetic testing for rare/monogenic causes of obesity in an NHS weight management service

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Introduction: Genetic testing technology has improved considerably in recent years and is now more widely available. In the UK, obesity genetic testing is currently available from the NHS Genomic Medicine Service, or the Rare Obesity Advanced Diagnosis (ROAD) programme. We aimed to enable patients living with obesity the ability to access this genetic testing if they were eligible and interested in exploring this aspect of their care.
Methods: In February 2023 we introduced ROAD genetic testing (a panel of 79 genes and 1 chromosome region) in our regional adult medical obesity clinic. All patients provided written informed consent. Decisions to offer genetic screening were based on: BMI >40 kg/m² (n=48, 98.0%), early onset in childhood (n=42, 85.7%), family history (n=11, 22.4%), features of hyperphagia (n=6, 12.2%) or developmental delay/learning disability (n=6, 12.2%).
Results: We performed 60 tests (23 buccal swabs, 37 saliva) in 49 patients (11 repeats, 2 pending). Patients were majority female (n=31, 63.3%) with mean age 35.3 ± 1.4 yrs, weight 155.9 ± 5.3 kg and BMI 55.3 ± 1.6 kg/m². Pathogenic variants were detected in 8 patients (17.0%), with heterozygosity in PCSK1 (n=3), POMC (n=1), MC4R (n=1) and ch16p11.2 deletion syndrome (n=3). Variants of unknown significance (VUS) were reported in a further 19 (40.4%) patients. In 20 (42.6%), no pathogenic variants explaining the clinical phenotype were detected. To date, 4 patients with pathogenic variants have been commenced on semaglutide (Wegovy®), with the first 2 reaching 6 months' treatment reducing weight by 7.8 and 13.2% so far.
Conclusion: Aberrations in genes proposed to regulate appetite are common in the medical obesity clinic. Identification may provide patients with an explanation for their weight gain, facilitate testing of family members and enable access to obesity pharmacotherapy in research/treatment pathways. However, VUS detection is likely to be more common with ROAD than the NHS Severe Early-Onset Obesity panel (a smaller panel of 33 genes associated with obesity). Further study on predicting response to obesity treatments based on genotype is needed.

PO4.335

Sex- and BMI-Specific Patterns in Body Composition in a Large Cohort of Individuals with Obesity

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Introduction: Sex-specific differences in body composition likely play a critical role in understanding obesity-related health risks and tailoring interventions. While BMI is widely used to classify obesity, it does not distinguish between fat and muscle mass, nor does it account for sex-specific patterns in body composition. This study examined how body composition differs between sexes and across BMI classes in a large cohort of individuals living with obesity providing insights for personalized approaches to obesity management.
Methods: Body composition of 5347 participants (1515 males, 3832 females; age 39±11 years; body mass 109.2±23.9 kg; BMI 39.5±7.4 kg/m²) living with obesity was assessed using an InBody 770 Body Composition and Body Water Analyzer. Measurements included body mass, body fat mass (BFM), skeletal muscle mass (SMM) and fat free mass (FFM). Skeletal muscle index (SMI) and BMI were calculated. Participants were categorized by BMI: Class I: BMI of 30–34.9 kg/m2; Class II: BMI of

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35–39.9 kg/m2; Class III: BMI of ≥40 kg/m2. Data were analyzed using Generalized Linear Models to assess the main effects and interactions between sex and BMI category on body composition measures (percentage of BFM [%BFM], SMM [%SMM] and FFM [%FFM], and SMI) with post-hoc Tukey-adjusted comparisons to identify significant differences.
Results: There were significant main effects of sex and BMI-class on BFM percentage, FFM percentage, SMM percentage and SMI ($p < 0.0001$), with significant sex × BMI-class interactions for BFM, FFM and SMM ($p < 0.0001$). The interaction between sex and BMI-class was not significant (p=0.08). Post-hoc tests indicated that women had higher %BFM in higher BMI categories, and the BMI-related differences in %BFM were more pronounced in women. In contrast, men had higher %FFM and %SMM across all BMI groups, with more pronounced differences in higher BMI categories.
Conclusions: These data suggest that the relationship between BMI and body composition varies by sex. Women had greater increases in %BFM across BMI categories, while men exhibited higher levels of %FFM, %SMM and SMI across all BMI classes. Notably, differences in %FFM, %SMM and SMI between men and women were more pronounced at higher BMI categories. These findings highlight the importance of body composition and sex-specific approaches in interventions targeting body composition, particularly in higher BMI categories, to address distinct patterns of fat accumulation and muscle distribution.

PO4.336

Development of an Integrated Obesity Evaluation Framework (IOEF): A Tool for Assessing Obesity's Health and Economic Impact

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Introduction: Obesity is a complex condition resulting from biological, environmental, and socioeconomic interactions. It contributes to systemic inflammation, metabolic disorders, and rising healthcare costs. Traditional metrics like BMI fail to capture obesity's multifaceted dimensions, necessitating a more integrative approach. Building on the Systemic Obesity Immune Inflammation Index (SOII) and the exposome framework, this study proposes the Integrated Obesity Evaluation Framework (IOEF). IOEF systematically combines immune-inflammatory biomarkers with spatial, socioeconomic, and environmental data to provide a comprehensive tool for assessing obesity's health and economic impacts.
Methods: he IOEF integrates SOII, reflecting systemic inflammatory burdens, with key socioeconomic indicators (e.g., income, education, employment) and spatial data (e.g., urban design, food environments). Health outcomes, such as healthcare utilization and economic impacts, including productivity loss, are also included. Statistical and geospatial models explore relationships among these variables, linking life-course environmental exposures to obesity's systemic and economic impacts.
Results: The development of SOII and preliminary exploration of the IOEF components suggest it is theoretically feasible to develop a framework assessing obesity's health and economic impact. Existing literature supports the strong correlation between BMI and socioeconomic factors [1] and the significant role of environmental conditions in influencing obesity prevalence [2]. Studies demonstrate the utility of spatial data and socioeconomic indicators in predicting health outcomes [3], laying a solid foundation for integrating these variables into IOEF. Furthermore, economic analyses indicate a measurable link between obesity and healthcare costs [4], supporting the inclusion of economic factors.
Conclusion: The IOEF is a theoretically robust framework for evaluating obesity's systemic and economic impacts. Integrating SOII with socioeconomic, spatial, and environmental data, the IOEF may offer actionable insights into obesity's drivers and consequences. Future research should validate IOEF components, test their reliability, and assess their utility for healthcare planning, policy development, and resource allocation. This innovative approach can potentially transform obesity evaluation and management in clinical and public health settings.

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PO4.337

Body Composition Differences Between Morbidly Obese Patients Pre-Bariatric Surgery and Healthy Controls

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Introduction: Morbid obesity is a chronic, multifactorial disease that significantly affects quality of life and is linked to numerous comorbidities. Bariatric surgery is an effective intervention for severe obesity, promoting substantial weight loss and improvements in metabolic, functional, and body composition parameters. These benefits support recovery and long-term health maintenance.
Objective: To compare body composition, muscle functionality, and metabolic status between morbidly obese patients and healthy controls with similar demographic characteristics, aiming to identify specific alterations associated with severe obesity.
Materials and Methods: An observational study was conducted to evaluate morphofunctional parameters in morbidly obese patients and a healthy control group matched for age, height, and sex. Body composition was assessed using bioelectrical impedance vector analysis (BIVA) and nutritional ultrasound to measure muscle mass, fat distribution, and tissue quality. Functional evaluations included handgrip strength (HGS) and the Timed Up and Go Test (TUG). Statistical analyses were performed to identify significant group differences.
Results: Severe obesity was associated with significantly higher total and regional fat mass, lower phase angle (PhA), and reduced relative strength, reflecting functional impairment. While absolute lean mass was greater in obese patients, its proportion relative to body weight was lower. Morphofunctional evaluations revealed significant differences between groups, highlighting the metabolic and functional challenges linked to severe obesity.
Conclusion: Severe obesity is characterized by increased fat mass, reduced muscle functionality, and unfavorable metabolic profiles. These findings highlight the necessity of assessing morphofunctional parameters beyond BMI to better understand metabolic and functional risks. Personalized interventions targeting these parameters can improve outcomes in managing severe obesity.

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Tab. 1. Morphofuncıonal Parameters.

Variable	Group 1 (Mean ± SD)	Group 2 (Mean ± SD)	p-value
Age	46.39 ± 9.99	46.57 ± 15.58	0.935
Weight	132.92 ± 26.67	75.24 ± 13.19	<0.001
Height	165.81 ± 8.85	168.03 ± 7.93	0.110
BMI	47.97 ± 7.57	26.41 ± 4.08	<0.001
PhA	5.63 ± 0.63	6.27 ± 0.78	<0.001
SPhA	-0.02 ± 0.48	-0.17 ± 0.73	0.152
Rz	424.25 ± 54.07	566.39 ± 87.08	<0.001
Xc	41.21 ± 7.73	61.51 ± 8.02	<0.001
FFM	65.81 ± 12.35	51.27 ± 9.65	<0.001
BCM	34.12 ± 7.40	28.31 ± 6.67	<0.001
FM	67.08 ± 20.00	23.13 ± 7.64	<0.001
NAK	0.83 ± 0.09	0.93 ± 0.10	<0.001
BCMI	12.26 ± 1.84	9.99 ± 1.82	<0.001
Hydration	75.38 ± 2.94	72.91 ± 0.74	<0.001
Nutrition	977.33 ± 224.62	823.27 ± 187.19	<0.001
ASMMI	10.25 ± 1.50	8.29 ± 2.88	<0.001
FMI	24.28 ± 6.67	18.12 ± 2.39	<0.001
CP	48.64 ± 6.71	37.01 ± 3.65	<0.001
Rectus femoris area	5.24 ± 1.32	4.68 ± 1.42	0.006
Circumference	9.29 ± 1.16	9.13 ± 1.04	0.396
Axis X	3.35 ± 0.58	3.46 ± 0.50	0.246
Axis Y	1.82 ± 0.53	1.54 ± 0.38	<0.001
Subcutaneous leg fat	2.66 ± 0.97	1.88 ± 0.46	<0.001
Axis Y contraction	2.06 ± 0.46	1.19 ± 0.52	<0.001
Total abdominal fat	4.08 ± 1.22	1.87 ± 0.72	<0.001
Superficial abdominal fat	2.20 ± 0.78	0.85 ± 0.37	<0.001
Preperitoneal abdominal fat	1.02 ± 0.43	0.69 ± 0.41	<0.001
Dynamometry	33.83 ± 11.13	35.43 ± 12.76	0.438
BCM/KG	26.08 ± 4.34	37.72 ± 5.79	<0.001
FM/KG	49.95 ± 6.93	30.70 ± 7.44	<0.001
SMM/KG	8.14 ± 1.24	11.14 ± 1.61	<0.001
Dynamometry/KG	25.78 ± 7.65	46.64 ± 13.09	<0.001

PO4.338

Effectiveness of a Community-Based Multidisciplinary Specialist Weight Management Programme: A Comparison of Virtual and Face-to-Face Delivery Methods

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Introduction: Without effective intervention, the UK is projected to have one of the highest rates of adult obesity by 20321, increasing chronic disease, mortality and healthcare expenditure. Community-based behavioural change and weight management programmes (BCWMP) are internationally recognised as optimum settings for weight management services increasing access to care2-4. This study reports on the impact of a virtual and face-to-face Tier 3 multidisciplinary specialist behavioural change and weight management programme in a London cohort.
Methods: The SEL healthy living programme (SELT3) is a community-based multidisciplinary specialist BCWMP. Programme eligibility includes adults registered in five Southeast London boroughs, BMI >35 kg/m2 with type 2 diabetes or a ≥BMI 40 kg/m2 with prediabetes. The programme has two treatment pathways: a diet and lifestyle behavioural change intervention (Balance) or a 3-month total meal replacement (TMR, 800-1200 kcal/d) followed by a diet and lifestyle behavioural change programme (Fast). Each pathway consists of 12-group sessions delivered over 12-months as either virtual (V) or face-to-face (F2F) sessions. The primary outcome was 70% of participants losing ≥5% weight at 12-months. Data is reported as means ± SD and statistical significance is considered $p<0.05$.
Results: Participant characteristics for Balance and Fast treatment pathways were similar at baseline, majority female, white or black African/Caribbean. Participants (n=493) of Balance lost -4.1 kg from baseline to end of programme ($p<0.01$). Greater weight loss was reported for Balance V compared to F2F (-4.9 ± 11.4 kg (-4%) vs -2.8 ± 8.4 kg (-2.3%), $t(489)=2.331$, $p=0.02$). Programme completion was associated with 3% weight loss (-3.7 ± 10 kg overall; Balance F2F -2.8 ± 8.4 kg (-2.3%) and Balance Virtual -5.1 ± 11.7 (-4%). 28.4% of the overall Balance cohort lost ≥5% of initial weight (weight change -13.6 ± 7.8 kg [range -50.9 to -5.1 kg]). Weight change in the overall Fast cohort (n=288) was -11.3 kg (-9.4%; -4 unit reduction in BMI); no difference in weight loss was observed between virtual or face-to-face delivery of Fast ($p=0.955$). 64% and 74% of completers of the Fast programmes lost ≥5% and ≥3% of initial weight equating to -17.6 ± 10.6kg and -16 ± 11 kg respectively. In those achieving ≥3% weight loss the average weight loss was -15.3 ± 10.6 kg for Fast F2F and -16.4 ± 11.1 kg for Fast V.
Conclusion: Both treatment pathways of the SELT3 resulted in weight loss. However, the TMR pathway resulted in substantial weight loss, regardless of service delivery method. Virtual delivery of a Tier 3 TMR-pathway should be explored further as it represents a scalable and

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accessible solution to address the projected rise in obesity rates in the UK. Future research should also seek to optimise weight loss through diet and lifestyle behavioural change programmes and support participants to achieve clinically meaningful weight loss.

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PO4.339

A systematic review of the prevalence of nutritional deficiencies in individuals living with obesity

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Objective: Previous studies indicate a high prevalence of nutritional deficiencies in individuals living with obesity. Although the effects of nutrient deficiencies on various human functions have been extensively studied, limited information exists on how these deficiencies specifically impact individuals with obesity. This review aimed to investigate the prevalence of such deficiencies and their associations.
Methodology: We conducted a search of studies published between 2010 and 2024 in PubMed/Medline that examined correlations between obesity and deficiencies in vitamin D, iron, vitamin B12, and multiple nutrients. The initial search identified 66 articles, of which 30 met the eligibility criteria. Literature reviews and studies with insufficient data were excluded.
Results: The 30 eligible articles were categorized into four main groups based on the deficiencies studied. Of the 15 articles examining vitamin D deficiency in individuals with obesity, 12 reported a significant positive relationship, with prevalence rates ranging from 35% to 87.5% (25(OH) vitamin D < 30 ng/ml). All seven studies on iron deficiency reported a positive association; however, four highlighted an inverse relationship between ferritin and obesity, suggesting that ferritin may act as a marker of inflammation rather than reflecting true iron status in individuals with obesity.
For vitamin B12 deficiency, only two eligible studies were identified, both of which demonstrated a significant positive association with obesity. Regarding multiple nutrient deficiencies, all eight selected studies reported positive findings, with a combined deficiency prevalence of approximately 38.4% in individuals with obesity. Folate and 25(OH) vitamin D deficiencies were most strongly associated with more severe obesity (BMI > 40 kg/m²).
Conclusion: Nutritional deficiencies are highly prevalent in individuals living with obesity, with vitamin D, iron, vitamin B12, and multiple deficiencies being commonly observed. These findings emphasize the need for targeted nutritional assessment and management in this population to improve overall health outcomes.

PO4.340

Surgical-induced weight-loss, but not pharmacotherapy, is associated with reversal of the pro-inflammatory phenotype of high-density lipoprotein particles in patients with type 2 diabetes and chronic kidney disease

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Introduction: Chronic low-grade inflammation is a classic hallmark of obesity that drives multiple cardiometabolic complications including type 2 diabetes (T2D) and chronic kidney disease (CKD). High-density lipoprotein (HDL) particles carry a large repertoire of proteins in circulation and switch towards a pro-inflammatory phenotype in patients with deteriorating metabolic health. Within this study we sought to investigate and compare the effects of bariatric surgery-induced weight-loss versus standard-of-care pharmacotherapy, on the proteomic composition of HDL particles in patients with T2D and CKD to determine whether weight-loss could restore the anti-inflammatory phenotype of cardioprotective HDL particles.
Methods: Between May 2011 and September 2021, patients with T2D and CKD were enrolled in Chile, and underwent gastric bypass (GB, *n*=20), sleeve gastrectomy (SG, *n*=20) or were treated with liraglutide (1.8mg/daily) (*n*=18) ± SGLT2 inhibitors (*n*=5) (as medically indicated). HDL particles were isolated from serum using a two-step extraction and purification, followed by tryptic digestion (Promega). The timsTOF Pro mass spectrometer (Bruker Daltonics) coupled to an EvoSep One system (EvoSep BioSystems) was used to determine proteomic composition. Mass spectra were identified and analysed using MaxQuant (v2.0.3.0) and Perseus (v2.0.3.1) software. Data were analysed using Perseus (v2.0.3.1) and Prism (v10) software. A novel HDL inflammatory index score derived from (*n*=20 proteins) was also applied to this discovery proteomics dataset.
Results: Bariatric surgery was associated with greater weight-loss (GB -22.4%, SG -19.8% and pharmacotherapy -5.2%) and improvements in metabolic parameters including HbA1c (GB -25.3%, SG -23.2% and pharmacotherapy -22.8%) and HDL-C (GB +30%, SG +30% and pharmacotherapy +9%) than pharmacotherapy. Surgical induced weight-loss reversed the pro-inflammatory phenotype of HDL particles with changes in *n*=55 proteins, including reductions in complement factor I (CFI), serum amyloid A 1 (SAA1), and vitronectin (VTN), and increases in serum paraoxonase 3 (PON3) and apolipoprotein D (APOD). By contrast, intervention with pharmacotherapy had very heterogeneous effects on the HDL proteome. A reduction in the HDL-inflammatory index score was evident in both surgical groups (p≤0.0001) but not in the pharmacotherapy group.
Conclusions: The inflammatory phenotype of HDL particles in patients with T2D and CKD is reversible by surgical-induced weight-loss, but not by lower-doses of GLP-1 agonists. Further studies investigating the impact of pharmacotherapy-induced weight-loss with higher-dose GLP-1 agonists are needed to decipher whether the beneficial effects of surgery can be replicated. The HDL proteome provides in-depth insights into metabolic health and can be used to survey metabolic disease progression/regression.

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PO4.341

Gut microbiome profiling in people living with obesity

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Introduction: World Health Organization recognizes obesity as a multifactorial chronic disease and a public health problem. Previous research has proposed that gut microbiome is emerging as a significant contributor to obesity. In these studies the Prevotella genus was found to be a potential biomarker for obesity after performing Illumina sequencing. The Lactobacillus genus was more abundant, but the Akkermansia, Roseburia, Faecalibacterium, Oscillibacter, and Alistipes genera were less abundant in people with BMI>30kg/m2. Furthermore, the Firmicutes to Bacteroidetes ratio was directly proportional to BMI. Our study explores the gut microbiome profile in people with obesity and the impact of lifestyle intervention on microbiome composition after weight loss.
Methods: We have initiated a prospective cohort study at Cerrahpaşa Medical Faculty, EASO Collaborating Center for Obesity Management (COM). We have already recruited nine people living with obesity who are medication-naive and devoid of any co-morbidities. We obtained stool samples and analyzed them with Nanopore long-read sequencing to determine their gut microbiome composition at the species level. Based on the participants' gut microbiome profile and current lifestyle, we prescribed an AI-based hypocaloric Mediterranean diet and supplements accompanying aerobic and anaerobic exercise as directed by current guidelines to bring the values of bacteria to optimal range in gut flora. We collected the samples from two participants who completed the study at 3 months of follow-up and compared them with baseline gut microbiome composition along with anthropometric parameters.
Results: In nine participants (F/M 3/6; mean age 30; BMI of 35.26 kg/m2; waist to height ratio-WtHR- 0.63) gut microbiome analysis showed that the participants had high Roseburia (8%), high Lactobacillus (0.8%), low Prevotella (1.38%), low Akkermensia (0%), low Alistipes (0.07%), a Firmicutes to Bacteroidetes ratio of 0.24, optimal Oscillibacter (0.75%), and optimal Faecalibacterium (17%) abundances at baseline. The two participants who completed the 3 month follow-up period had a reduction in body weight, BMI, and WtHR of 9.36%, 9.87%, and 3.39% respectively. Gut microbiome analysis for the third-month samples of these participants showed that Roseburia increased 4.13 fold. Prevotella decreased by 18%. Firmicutes to Bacteroidetes ratio increased 20.5 fold. There was no change in Akkermensia (0%) abundance. Lactobacillus increased 35.5 fold. Alistipes and Oscillibacter abundances were lower. Faecalibacterium decreased for one of the participants and increased for the other.
Conclusion: The baseline gut microbiome bacteria composition of the participants with obesity in our study was partially in line with previous findings in the literature. The increased Firmicutes to Bacteroidetes ratio that was inversely proportional to BMI requires clarification. This discrepancy may be explained by inadequate number of participants, differences in sample processing, and data analysis. We will obtain concrete results at the conclusion of this ongoing study.

PO4.342

Association between Vitamin D deficiency, cardiovascular risk, and triglyceride-glucose index in young adults

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Introduction: Vitamin D deficiency has been associated with increased insulin resistance (IR) and dyslipidemia, which are important factors in the development of cardiometabolic disorders. However, the relationship with vitamin D status and cardiovascular risk in young adults remains underexplored. Evaluating these associations in young adults is particularly important, as early identification of risk factors can provide opportunities for timely interventions, potentially preventing the progression of cardiometabolic disorders and promoting long-term health. This study aims to evaluate the association between vitamin D deficiency, cardiovascular risk, and IR in young adults.
Methods: A cross-sectional study was conducted with 203 young adults (15 - 24 years), residing in Brasília-DF, Brazil. Data collection included sociodemographic characteristics and serum measurements of 25(OH) D, fasting glucose, triglycerides, and high-sensitivity C-reactive protein (hs-CRP). The triglyceride-glucose (TyG) index has been used as a marker to assess IR due to its low cost and easy calculation: TyG= Logn [triglycerides (mg/dL) × fasting glucose (mg/dL)/2]. TyG values >8.61 were considered indicative of an elevated risk for insulin resistance (IR), 25(OH)D levels <20 ng/mL were classified as vitamin D deficiency, and hs-CRP levels >0.3 mg/dL were considered a cardiovascular risk. Descriptive statistics, simple and partial correlation, Chi-square analyses, and binary logistic regression were performed in Statistical Package for the Social Sciences (SPSS) software.
Results: The sample included young adults with a mean age of 21.17 ± 1.7 years, of which 65.0% were female. The mean hs-CRP, and 25(OH) D levels were 0.4±1.6mg/dL, and 25.8±7.0ng/mL, respectively. Among those with vitamin D deficiency, 29.8% had an elevated risk of IR, while only 16.2% of those with sufficient vitamin D presented an elevated risk of IR (p=0.022). Regarding elevated hs-CRP, 35.3% had an elevated risk of IR, while only 14.0% of those with low cardiovascular risk had an elevated risk of IR by the TyG (p<0.01). A significant positive correlation was found only between the TyG index and serum hs-CRP (r=0.357, p<0.001), controlling for age and sex. Logistic regression revealed that those with vitamin D deficiency have 2.18 times higher odds of having an elevated risk of IR by TyG index (OR=2.18, p=0.047) compared to those with sufficient vitamin D, while those with higher cardiovascular risk by hs-CRP had 3.3 times the odds of having elevated risk of IR (OR=3.32, p=0.001), compared to those with lower cardiovascular risk.
Conclusions: Vitamin D deficiency and elevated cardiovascular risk are associated with higher odds of having an elevated risk for IR by the TyG index. These findings suggest that both vitamin D status and cardiovascular risk may play a role in metabolic profile in young adults. While the TyG index requires further exploration in this context, it has shown promise as a parameter for assessing IR and as an important indicator of early metabolic risk in this population.

PO4.343

Anti-Obesity Medications and Their Impact on Muscle Mass – A Narrative Review

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Introduction: The management of obesity (OB) and overweight (OW) has advanced significantly in the past decade, largely due to the adoption of incretin-based agents, which have shown remarkable efficacy in

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achieving substantial weight loss (WL). However, concerns have arisen regarding their potential impact on skeletal muscle mass (SMM), warranting further investigation.

Methods: A PubMed search was conducted using the following strategy: "((anti-obesity agent[MeSH Terms]) OR (Glucagon-Like Peptide-1 Receptor Agonists[MeSH Terms]) OR (anti-obesity medications) OR (anti-obesity drugs) OR (semaglutide) OR (tirzepatide) OR (liraglutide) OR (GIP) OR (incretins[MeSH Terms])) AND ((body composition[MeSH Terms]) OR (muscle mass) OR (fat-free mass))". The search included reviews (Rs), systematic reviews (SRs), clinical trials (CTs), randomized clinical trials (RCTs), and meta-analyses published in the last 10 years. Of 159 studies identified, 34 were deemed relevant after title and abstract screening.

Results: The analysis included 18 RCTs, 13 reviews, and 3 systematic reviews. Most studies employed dual-energy X-ray absorptiometry (DEXA) to evaluate body composition, with lean body mass (LBM) used as a proxy for skeletal muscle mass (SMM).

Studies reported varying outcomes regarding lean mass reduction (LMR). A trial on liraglutide in polycystic ovary syndrome (PCOS) patients reported 5.2 kg of WL and 2.3 kg of LMR, while another trial in obesity with PCOS showed no significant LMR. In individuals with cardiovascular risk factors, liraglutide led to 5.4% WL and 1.57% LMR. In type 2 diabetes mellitus (T2DM) patients on insulin, no significant effects on skeletal muscle index were observed.

A semaglutide RCT comparing very-low-calorie diets, semaglutide, or both in T2DM patients revealed similar LMR across groups, with semaglutide showing smaller fat mass reductions. In the STEP 1 trial, DEXA data from 140 participants showed 3.43 kg of absolute LMR with semaglutide, along with a 2.94% proportional increase in LBM relative to total body mass.

For tirzepatide, a systematic review reported significant fat mass and visceral adipose tissue reductions, but LBM findings were inconclusive. A liraglutide study also showed a 2.87% reduction in thigh muscle fat, suggesting a protective effect on muscle composition.

Phase 3 RCTs, including STEP-1 and SURMOUNT-1, reported LBM accounting for 39% and 24% of total WL with semaglutide and tirzepatide, respectively, over 68–72 weeks. This corresponded to net LMRs of up to 10.1% and 7.9% of baseline weight. No studies evaluated muscle strength or function.

Conclusion: The effects of incretin-based anti-obesity medications on LBM and SMM remain inconclusive. While these agents effectively reduce fat mass and promote overall WL, observed LMR highlights the need for further research to assess long-term impacts on muscle composition and function. Future strategies should aim to preserve muscle health during weight loss interventions.

PO4.344

Age and Postoperative Time as Determinants of Food Processing Intake in Women after Metabolic Bariatric Surgery: A Cross-Sectional Analysis

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Introduction: Metabolic and Bariatric Surgery (MBS) promotes significant weight loss and improvement of weight-related comorbidities. However, the success of MBS in the long term also depends on the maintenance of healthy habits, such as prioritizing unprocessed and minimally processed food and minimizing ultra-processed food intake. The intake of ultra processed food has been frequently associated with weight gain and metabolic complications in the general population. In individuals post-MBS, the relationship between food intake according to their possessing degree and demographic and clinical parameters such as age, and postoperative time is limited. Thus, this study aimed to evaluate the relationship between processing food intake, age, and postoperative time after MBS.

Methods: A cross-sectional analysis was performed in databases from two studies, including adults at least 2 years post-MBS in Brasilia, Brazil. A total of 194 women (age: 45.0±9.6 years, current body mass index: 31.2±6.1 kg/m2, and postoperative time: 6.8±3.6 years) were evaluated. A questionnaire was applied to assess age and postoperative time, and weight and height were measured. Age and postoperative time were categorized according to their median (age: <45 years and ≥45 years; postoperative time: <7 years and ≥7 years). The dietary intake according to the processing food degree was evaluated using the NOVA score instrument, measuring unprocessed/minimally processed (raging from 0 to 13 points) and ultra-processed foods (raging from 0 to 10 points) intake. Higher scores indicate greater intake. Mann-Whitney test, Spearman correlation, and linear regression models using bootstrap (1000 sampling) were performed in Statistical Package for the Social Sciences (SPSS) software.

Results: Unprocessed/minimally processed score inversely correlated with postoperative time (r=-0.158; p=.029), while ultra-processed score inversely correlated with age (r=-0.206; p=.004). Women <45 years consumed more ultra-processed food (2.5±1.4) than those ≥45 years (2.0±1.6; p=0.031). Those with <7 years postoperative time consumed more unprocessed/minimally processed food (7.2±2.1) than those ≥7 years (6.3±1.8; p=.022). A 10-year decrease in age was associated with an increase of 0.3 points in the ultra-processed food score (p=.005), and a 10-year increase in the postoperative time with a reduction of 0.8 points in the unprocessed/minimally processed score (p=.011), adjusting for weight.

Conclusions: Young women are more susceptible to consuming ultra-processed food, while longer postoperative time is related to reduced unprocessed/minimally processed food intake. Nutritional education strategies are necessary to minimize ultra-processed intake among younger women and sustain adequate unprocessed/minimally processed food intake in the long term of MBS, a period prone to clinical follow-up loss.

PO4.345

Osteosarcopenic Obesity: An Underdiagnosed Condition?

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Background: Osteosarcopenic obesity (OSO) is a growing health concern characterized by the interplay of three factors: excess body fat, muscle mass loss, and bone health deterioration. Studies have explored its diagnostic criteria and clinical challenges, with some proposing updated guidelines to enable early detection. These guidelines emphasize the importance of imaging techniques, body composition assessments, and biomarkers to achieve precise diagnoses.

Methods: A comprehensive literature search was conducted in the Cochrane, Scopus, and PubMed databases, focusing on systematic reviews (SRs) published from January 2005 to December 2024. The keywords used were "osteosarcopenic obesity" and "obesity osteosarcopenic." A total of 33 articles were identified; 15 were excluded based on titles, and 5 were excluded after full-text review, leaving 13 articles for detailed analysis.

Results: OSO is linked to a 24% higher risk of all-cause mortality compared to individuals without the condition, with men being disproportionately affected. Prevalence varies widely, from ~0% to 19%, depending on the population and diagnostic criteria used. Prevalence increases with age, but even young adults (18–21 years) with overweight or obesity exhibit reductions in bone and muscle mass. High fat mass is a major driver of osteosarcopenia, with prevalence ratios of 1.46 for men and 2.25 for women aged 60 or older. Additionally, metabolic syndrome, commonly associated with excess fat and insulin resistance, raises the risk of OSO by approximately 2.5-fold.

Diagnosing OSO remains challenging due to a lack of standardized criteria. While some studies use dual-energy X-ray absorptiometry (DEXA) for body composition assessment, others rely on bioimpedance or body mass index (BMI), leading to inconsistent findings. This variability complicates comparisons between studies and the establishment of universal

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diagnostic standards. Moreover, OSO frequently overlaps with other age-related degenerative conditions, further contributing to its underdiagnosis. For instance, a large-scale study of over 60,000 women demonstrated that high body weight does not protect against fractures and is associated with an increased risk of fractures in the ankle and upper leg. These findings highlight the complexity of the relationship between excess fat and bone health, underscoring the need for diagnostic approaches that extend beyond BMI to include detailed body composition analyses.
Conclusion: OSO presents a growing public health challenge, particularly in aging populations. Accurate diagnosis and comprehensive interventions are essential to mitigate its impact and enhance the quality of life for those affected. Recognizing OSO as a multifactorial condition involving fat, muscle, and bone health is key to developing effective prevention and treatment strategies. Achieving consensus on diagnostic criteria is critical for timely identification and management, ultimately preventing disease progression.

PO4.346

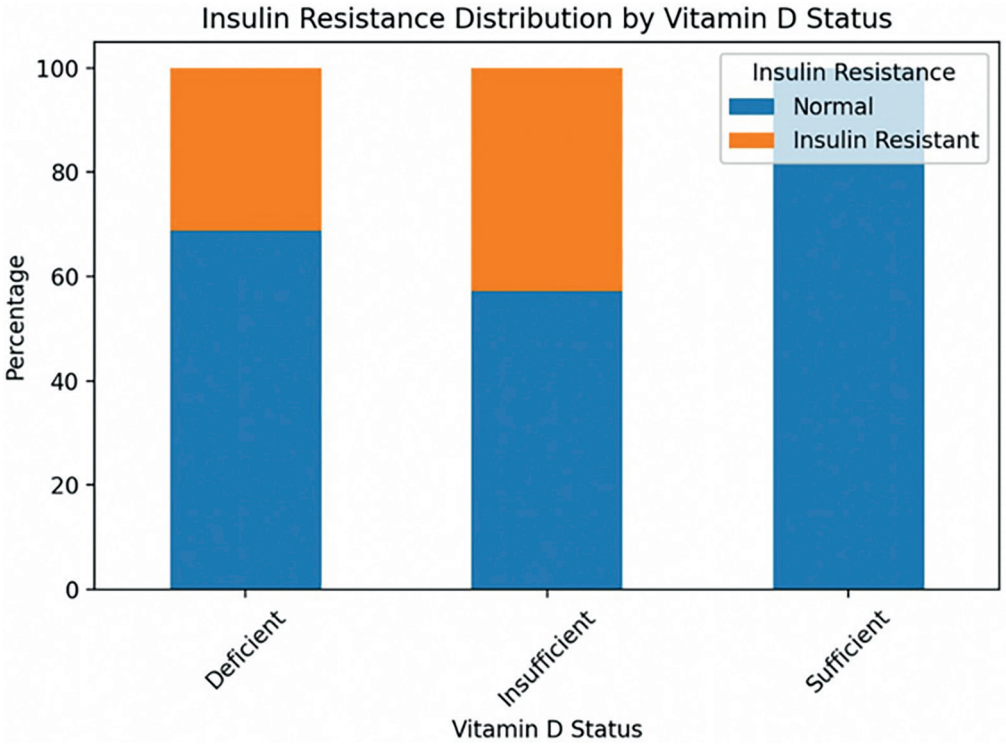
The impact of insulin resistance on vitamin D levels in postmenopausal women with adiposity: A cross-sectional study

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Introduction: Insulin resistance (IR) and vitamin D deficiency are highly prevalent among postmenopausal women with adiposity. While studies suggest a potential link between these conditions, the relationship remains unclear. This study examines the association between insulin resistance and vitamin D levels in postmenopausal women with adiposity.

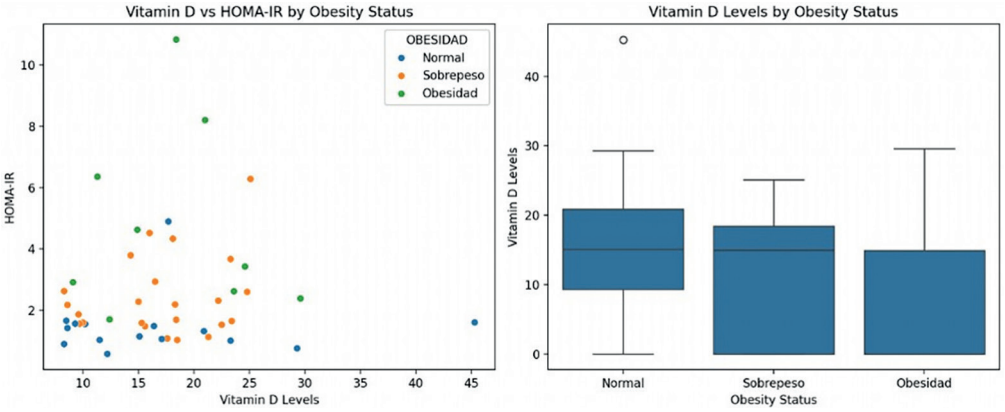
Methods: This cross-sectional study included 47 postmenopausal women aged 45-59 years. Vitamin D levels were measured using chemiluminescence immunoassay, and IR was calculated using the HOMA-IR formula. Participants were categorized into "Normal," "High," and "Insulin Resistance" based on HOMA-IR values. Body composition and anthropometric measurements were taken. Correlation analysis and scatter plots assessed the relationship between HOMA-IR and vitamin D levels.
Results: The average age of the participants was 53.04 years (SD = 3.73), the onset of menopause was at 47.19 years (SD = 4.52), and the duration of amenorrhea was 5.85 years (SD = 4.81). Based on BMI, 49% of the participants were classified as overweight (mean 27.04, SD = 4.79 kg/m^2), while 72.30% were classified with obesity according to their body fat percentage (mean 42.45, SD = 5.93%). Additionally, 53.30% were at high risk due to waist circumference (mean 89.73, SD = 11.88 cm), with a tendency for body fat accumulation in the abdominal region. The mean vitamin D level was 17.25 ng/mL (SD = 7.21), indicating a widespread deficiency in this population. The mean glucose level was 103.32 mg/dL (SD = 35.89), and insulin level was 10.12 µU/mL (SD = 8.88). Among the participants, 19.10% had altered glucose levels indicative of prediabetes, 17% had IR, and 76.60% were identified with mild to moderate vitamin D deficiency. A weak negative correlation was observed between HOMA-IR and vitamin D levels, with a correlation coefficient of -0.072 ($p > 0.05$), indicating no statistical significance. Additionally, no significant trend was identified between the different HOMA-IR categories and vitamin D levels.
Conclusion: While the study did not find a significant relationship between IR and vitamin D levels, the widespread deficiency in this population underscores the importance of interventions targeting vitamin D insufficiency. Although no significant association was found, addressing the high prevalence of vitamin D deficiency in postmenopausal women with adiposity remains critical. Future studies should consider additional variables, such as inflammation and visceral fat distribution, to further explore this relationship.



The graphical analysis revealed a scattered distribution, with no clear trend between insulin resistance and vitamin D levels. The average vitamin D levels were low, indicating a widespread prevalence of vitamin D deficiency in this population.

Fig. 1. Distribution of Insulin Resistance by Vitamin D status.

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Most women with vitamin D deficiency exhibit insulin resistance. The highest percentage of insulin resistance is observed in women with insufficient vitamin D levels. In contrast, women with sufficient vitamin D levels do not show any signs of insulin resistance.

Fig. 2. Vitamin D, insulin resistance, and obesity status in postmenopausal women.

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PO4.347

Metabolic dysfunction-associated steatotic liver disease increased the incidence of dementia in the elderly Korean, based on the Korean NHIS-HEALS cohort

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Background: Metabolic dysfunction-associated steatotic liver disease (MASLD) is associated with various diseases such as cardiovascular diseases and mortality. However, studies examining the effects of MASLD on cognitive impairment, especially dementia, are lacking.
Objective: This study was designed to investigate the association between MASLD and the risk of dementia in individuals aged 60 years or older.
Methods: This retrospective cohort study utilized data from the NHIS-HEALS focusing on individuals aged 60 and older (median follow-up of 9.4 years). This study examined the association with the incidence of all types of dementia in three groups: non-MASLD, intermediate MASLD, and high MASLD. Statistical analyses included survival estimates and Cox proportional hazards regression to evaluate the association between MASLD and dementia.
Results: Of the 113,281 included participants, the primary composite outcome (all dementia) occurred in 33.68 % (24,605 among 73,049), 34.44 % (10,483 among 30,441), and 34.38% (3,366 among 9,791) of the non-, intermediate, and high MASLD groups, respectively. Hazard ratios (HRs) (95% CIs) for intermediate and high MASLD groups were 1.01 (0.97–1.04) and 1.07 (1.02–1.14), respectively, in men and 1.03 (1.00–1.06) and 1.06 (1.01–1.11), respectively, in women after full adjustment
Conclusions: This study suggests that MASLD increases the risk of dementia in the elderly

PO4.348

Metabolic, Anthropometric, and Psychological Risks Associated with Gender-Specific Phenotypic Expression: A Study of a Cohort of 935 People with Obesity (PwO)

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Background: Lifestyle and environmental interventions in obesity have shown limited therapeutic effectiveness, with women often experiencing poorer outcomes. These differences may arise from gender-specific variations in the pathophysiology of obesity, and there is growing recognition of the importance of understanding them to develop tailored, gender-sensitive management strategies. This study aims to compare the clinical, anthropometric, metabolic, and psycho-emotional characteristics of obesity from a gender perspective
Methods: A cross-sectional analysis of 935 individuals with obesity (PwO) (690 women) from four public university hospitals in Madrid was conducted. Participants were evaluated using a standardized pathway including phenotypic assessment, body composition analysis, and evaluation of cardiometabolic, functional, and psycho-emotional comorbidities. Methods included multifrequency bioimpedance, Goldberg Health Questionnaire (GHQ, 28 items),biochemical analyses, and HOMA-IR (Homeostatic Model Assessment for Insulin Resistance). Statistical analyses were conducted using t-tests, Mann–Whitney U tests, and multivariable regression models in the statistical software 'R'.
Results: Men exhibited significantly higher levels of visceral fat mass, waist circumference, waist-to-height ratio, and skeletal muscle mass ($p<0.001$). Conversely, women showed a higher total body fat percentage, fat mass relative to body surface area, and lower muscle mass, both in absolute terms and relative to body surface area ($p<0.001$). These differences remained consistent across age groups, with postmenopausal women demonstrating greater visceral adiposity, more pronounced reductions in skeletal muscle mass, and elevated metabolic risk markers compared to their premenopausal counterparts ($p<0.001$).
Men exhibited higher fasting glucose, triglycerides, and HOMA-IR scores, while women had higher HDL cholesterol and greater psycho-emotional distress, reflected by elevated GHQ scores ($p<0.001$). Sarcopenic obesity was notably more common in women aged ≥50 years, affecting 31%

compared to 19% of men. Additionally, metabolic syndrome was significantly more prevalent in postmenopausal women than in both premenopausal women and age-matched men (p<0.01)
Conclusions: This analysis confirms distinct gender-specific obesity phenotypes: men are characterized by higher visceral adiposity and greater metabolic risk, whereas women exhibit increased total and subcutaneous fat, lower muscle mass, and a heightened psycho-emotional burden. Postmenopausal women emerge as a particularly high-risk group, presenting with central adiposity, sarcopenic obesity, and pronounced metabolic dysregulation, highlighting significant gender differences in aging and metabolic health. These findings emphasize the need for tailored interventions, prioritizing strength-based physical activity with psychological support for women from the outset

Tab. 1. Gender-Specific Differences in Cardiometabolic, Anthropometric, and Psychological Parameters.

	Males	Females	p-value
Visceral fat mass (kg)	26.71	24.54	p<0.001
Waist circumference (cm)	124.77	107.93	p<0.001
Waist-to-height ratio	0.72	0.67	p<0.001
Skeletal muscle mass (Kg)	39.39	28.11	p<0.001
Skeletal muscle mass (relative to body surface area)	16.83	13.92	p<0.001
Total body fat percentage	40.78	49.04	p<0.001
Fat mass (relative to body surface area)	21.74	23.27	p<0.001
Fasting glucose (mg/dl)	105.59	98.17	p<0.001
Triglycerides (mg/dl)	155.45	126.75	p<0.001
HOMA-IR	7.10	4.72	p<0.001
HDL cholesterol (mg/dl)	44.41	53.73	p<0.001
Psycho-emotional distress (Goldberg score)	5.90	7.51	p<0.001
Sarcopenic obesity (%)	19	31	p<0.01

PO4.349

Medium-term clinical outcomes of children of mothers undergoing bariatric surgery in a tertiary hospital

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Introduction: Maternal obesity increases the risk of different pathologies in offspring, and more women of reproductive age undergo bariatric surgery (BC). It is not known how maternal weight/nutritional changes after BC can affect the physical/psychomotor development of the children of the women who underwent surgery.
Objectives: To evaluate whether the nutritional/weight factors of women undergoing BC surgery have a medium-term impact on the physical/psychomotor development of their offspring.
Materials-Methods: Descriptive, cross-sectional study of children of mothers undergoing pregestational BC in our center. We collected data through clinical history and telephone interviews on anthropometry, associated pathologies and psychomotor development of children.
Results: We evaluated 40 children (17 girls), mean age of 6 years±3 months, from 29 mothers undergoing BC (15gastric bypass and 14tubular gastrectomy). At pregnancy, the mean age was 33.4±5.42 years and BMI was 32.38±6.93kg/m². The time interval between BC and pregnancy was 48.3±36.19 months. 17.5% of pregnancies occurred before the post-BC year. Weight gain during pregnancy was 9.10±5.97kg. 22.5% of the children had some type of psychomotor disorder, the most frequent being autism (7.5%), with a certain tendency in children with a higher percentile of birth weight (72.14±21.95vs51.1±32.21 p0.06). 65% of the children showed some pathology/condition, with respiratory diseases being more common (20%) followed by skin diseases (15%). It is noteworthy that a shorter time between BC and gestation is related to a higher number of pathologies/conditions in children, although in a non-statistically significant way (61.93±42.56vs41.08±30.74 p0.082). At the end of the cut, 50% had weight disorders: 17.5% underweight, 5% overweight, and 27.5% obese. No association was observed between any maternal weight/nutritional/pathological factor and the risk of presenting weight disorders/pathologies in the offspring.
Conclusion: Post-BC weight/nutritional changes do not seem to have a negative influence on the physical/psychomotor development of children of mothers undergoing BC surgery, possibly due to a positive effect of the close follow-up of these women in multidisciplinary units. It is evident that a short interreproductive time (<12 months) after BC could influence the development of pathologies in the offspring. However, additional research with long-term follow-up and a larger sample size is required.

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PO4.350

Unraveling the impact of daily life stress and glucocorticoid regulation on cardiometabolic health

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Introduction: Chronic stress is linked to cardiometabolic diseases through increased glucocorticoid exposure, but the impact of daily life stress on glucocorticoid regulation and cardiometabolic health remains underexplored. This study investigates these associations.
Methods: We included 870 participants from the Netherlands Study of Depression and Anxiety (NESDA) (64.7% female, median age 47.0 years) without a psychiatric disorder diagnosis in the six months prior to study. Daily life stress was assessed using the Daily Hassles questionnaire (DHQ, range 0-80). Salivary cortisol was analyzed for 1-h awakening cortisol (4 time points), diurnal slope and evening cortisol. Also an overnight 0.5 mg dexamethasone suppression test was performed. Associations between DHQ, glucocorticoid measures, and cardiometabolic health were studied using logistic and linear regressions.
Results: After multivariable adjustment, each SD increase in DHQ score was associated with 1.38-fold (95%CI 1.07;1.77) higher odds for cardiovascular disease (CVD), but not diabetes, metabolic syndrome, or obesity. DHQ scores were not associated with glucocorticoid measures. However, each SD increase in cortisol suppression ratio was associated with 1.37-fold (95%CI 1.08;1.72) higher CVD risk, but not diabetes, metabolic syndrome, or obesity. No interactions between DHQ and glucocorticoid measures on CVD risk were observed.
Conclusion: A higher cortisol suppression ratio, indicating increased glucocorticoid sensitivity, and increased daily hassles were independently associated with increased CVD risk. The absence of interaction between these factors suggests they influence CVD risk through separate pathways, highlighting the need for further research to better understand stress mechanisms and identify "stress profiles" most at risk for developing cardiometabolic diseases.

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PO4.351

Comprehensive Review of Hormone Therapy in Menopause: Cardiovascular and Metabolic Impacts in Women with Obesity

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Introduction: Women in postmenopause have a significant risk factor for metabolic syndrome (MetS) and cardiovascular disease (CVD), conditions exacerbated by hormonal and metabolic changes. This study objective is to review the evidence on metabolic and cardiovascular effects of hormone therapy (HT) in women living with obesity in postmenopause, considering risks and benefits on different therapeutics.
Methods: A comprehensive literature review was performed using specific descriptors and selecting studies in PubMed database from 2014 to 2024, including clinical trials, observational studies and meta-analyses that evaluated the effects of HT in metabolic and vascular parameters in postmenopausal women with obesity. The outcomes analysis included blood pressure, lipid profiles (HDL-C, LDL-C, triglycerides), glycemic control (fasting blood glucose, HbA1c), vascular reactivity (microvascular function, baroreflex sensitivity) and inflammatory markers.
Results: The use of low-dose transdermal estradiol in postmenopausal women with obesity improved vascular reactivity, especially microvascular function. In one of the meta-analyses HT with estradiol (E2) compared to CEE group, triglyceride levels (WMD 15.33, 95% CI 21.93 to - 8.73) and diastolic blood pressure (WMD 3.12, 95% CI - 6.14 to - 0.10) levels were statistically lower in the E2 group. However, the level of HDL cholesterol (WMD 5.54, 95% CI - 10.96 to - 0.13) was higher in the CEE. A randomized control trial on CEE combined with natural progesterone or dydrogesterone demonstrated significant improvements in HDL-C and LDL-C levels, but increased triglyceride concentrations (p = 0.140), especially at higher doses. The combination of estradiol with micronized progesterone preserved baroreflex sensitivity, reduced diastolic blood pressure and improved vascular responses to stress. However, CEEs have been associated with an increase in markers of hepatic lipogenesis, raising concerns about their impact on lipid metabolism in specific populations, emphasizing the need for personalized interventions in this group.
Conclusion: Hormone therapy in women with obesity in postmenopause demonstrated a wide range of metabolic and cardiovascular effects, with significant variations depending on the type, dose, and method of administration of hormonal agents. Low-dose transdermal estradiol offers a favorable safety profile for improving vascular function, with minimal inflammatory risks. On the other hand, the use of CEE, although beneficial for lipid profiles, requires caution due to the potential to exacerbate hypertriglyceridemia. Individualized approaches, based on patients' specific metabolic profiles, cardiovascular risk factors and menopausal status, are essential to optimize results. These findings emphasize the importance of personalized strategies and ongoing research for the management of hormone therapy during postmenopause, balancing therapeutic benefits with possible adverse effects.

PO4.352

Characterization of the androgen-dependent TFPI-regulating protein in human obesity

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Introduction: Obesity increases the risk of arterial and venous thrombosis due to inflammation arising from the dysfunctional adipose tissue. A newly identified molecule, the androgen-dependent TFPI-regulating protein (ADTRP), seems to be implicated as a protective factor in the development of cardiovascular disease. Interestingly, the adipose tissue is a significant source of ADTRP, functioning within fat depots as opposed to acting as a pro-inflammatory mediator in the endothelium. However, to date, there is still limited data about the characterization of ADTRP in human obesity.
Materials-Methods: We investigated the presence of ADTRP in adipocytes obtained from subcutaneous adipose tissue in an in vitro study, and then determined ADTRP plasma levels in patients with obesity undergoing bariatric surgery.
Results: Human adipocytes express ADTRP, which is ampened by the exposure to insulin (p=0.03), and slightly by lipopolysaccharide (p=0.51). In addition, cell incubation with androgens, especially non-aromatizable androgens, led to a decrease in ADTRP gene expression (p=0.005). Lastly, in patients with obesity elevated ADTRP levels in circulation, which tended to be higher in patients with insulin resistance; following bariatric surgery, a reduction in serum concentrations was observed (from 12321.5 ± 6964.3 vs 9061 ± 4798.4 pg/mL, p<0.001).
Conclusion: Human adipocytes express ADTRP, which potentially represents a mediator of adipose tissue inflammation in the context of hyperinsulinism. The reduction of ADTRP plasma levels after bariatric surgery may be related with the surgical reduction of fat mass. Further studies should evaluate the role of ADTRP as possible target in the adipose tissue dysfunction-related clinical complications.

PO4.354

Thyrotoxicosis and Tirzepatide: Management Challenges

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Background: Thyrotoxicosis is associated with weight loss and an increase in energy expenditure. Treatment often causes weight gain, an undesirable outcome for patients with pre-existing overweight/obesity. Tirzepatide, a dual GIP/GLP1 receptor agonist is a potent anti-obesity agent which has been shown to lead to an average weight loss of around 10%. The interaction of Tirzepatide with thyroid function in thyrotoxicosis remains understudied. We report a patient with obesity diagnosed with thyrotoxicosis while on Tirzepatide.
CASE HISTORY: A 36-year-old Emirati lady presented with a recent diagnosis of Grave's Disease (FT4 51.8 pmol/l, TSH <0.005 mU/l, TSH receptor antibody 1.90 (normal <1.75) iU/l). She was overweight (weight 71 kg, BMI 27 kg/m2), and had been on Tirzepatide (latest dose 10 mg weekly) for obesity. She had lost 25 kg in weight over the previous year. Following the diagnosis of thyrotoxicosis two months previously, Tirzepatide had been discontinued. This made her regain some weight (2.8 kg), about which she was unhappy. Previous history included asthma, anaemia, polycystic ovary syndrome (PCOS), uterine fibroids, and breast lumps. Apart from mild diffuse thyromegaly and sinus tachycardia with a rate of 103 beats per minute, the examination was otherwise unremarkable. She had normal haemoglobin. She was commenced on Carbimazole with an initial dose of 30 mg daily. Her Thyroid function tests improved with her FT4 six weeks after carbimazole initiation, reaching 17.3 pmol/l, although her TSH remained suppressed. The carbimazole dose was reduced to 20 mg daily. Her FT4 had further improved to 13 pmol/l 10 weeks after starting treatment. By this time, she had gained 6 kg in weight while remaining off Tirzepatide.
Discussion: This case raises important questions on the management of concomitant thyrotoxicosis and overweight in patients on weight loss medication, in particular, Tirzepatide. 1-Should Tirzepatide be discontinued? 2-If so, at what point can it be re-commenced? 3-What is the optimal treatment regimen for thyrotoxicosis in such cases? 4-Is the development of thyrotoxicosis related to Tirzepatide?
Conclusion: This case highlights the complexities of managing patients with thyroid disease, obesity, and multimorbidity. This patient is currently on the block-and-replace regimen, off Tirzepatide and under regular follow-up.

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PO4.355

Higher quality of life, thanks to obesity treatment

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Introduction: Kidney transplantation is the most effective treatment for kidney failure. A donor can be deceased or a living kidney donor, with the latter allowing for preemptive transplantation before dialysis begins. Obesity in potential kidney donors is one of the most common contraindications, given its association with complications and increased risks of diabetes and cardiovascular disease. However, advances in obesity management, including pharmacological interventions, can significantly improve patient outcomes and reduce these risks. This case report demonstrates the benefits of weight reduction not only for donor eligibility but also for overall health, exemplifying successful collaboration between medical specialties.

CASE: We describe a 63-year-old potential kidney donor with grade II exogenous obesity (BMI 37.8 kg/m^2) and stage II arterial hypertension. Due to her obesity-related risks, she was temporarily contraindicated for donation. A multidisciplinary approach involving obesity treatment with a GLP-1 receptor agonist led to significant weight loss, reducing her BMI to 33.4 kg/m^2 over four months. This improvement allowed her to continue donor evaluation for her son.

Conclusion: Obesity is a major barrier to kidney donation due to elevated risks of perioperative and postoperative complications. In this case, targeted obesity treatment enabled substantial weight loss, making donation possible. This underscores the importance of addressing obesity in donor candidates through coordinated, multidisciplinary care.

PO4.356

Association Between Low Muscle Mass and Non-Alcoholic Fatty Liver Disease (NAFLD) Severity in Obese Individuals

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Introduction: Obesity and sarcopenia are conditions frequently associated with metabolic alterations such as non-alcoholic fatty liver disease (NAFLD). This study analyzes the relationship between skeletal muscle mass (SMM) levels and the severity of NAFLD in obese individuals, emphasizing the high prevalence of low muscle mass in this population.

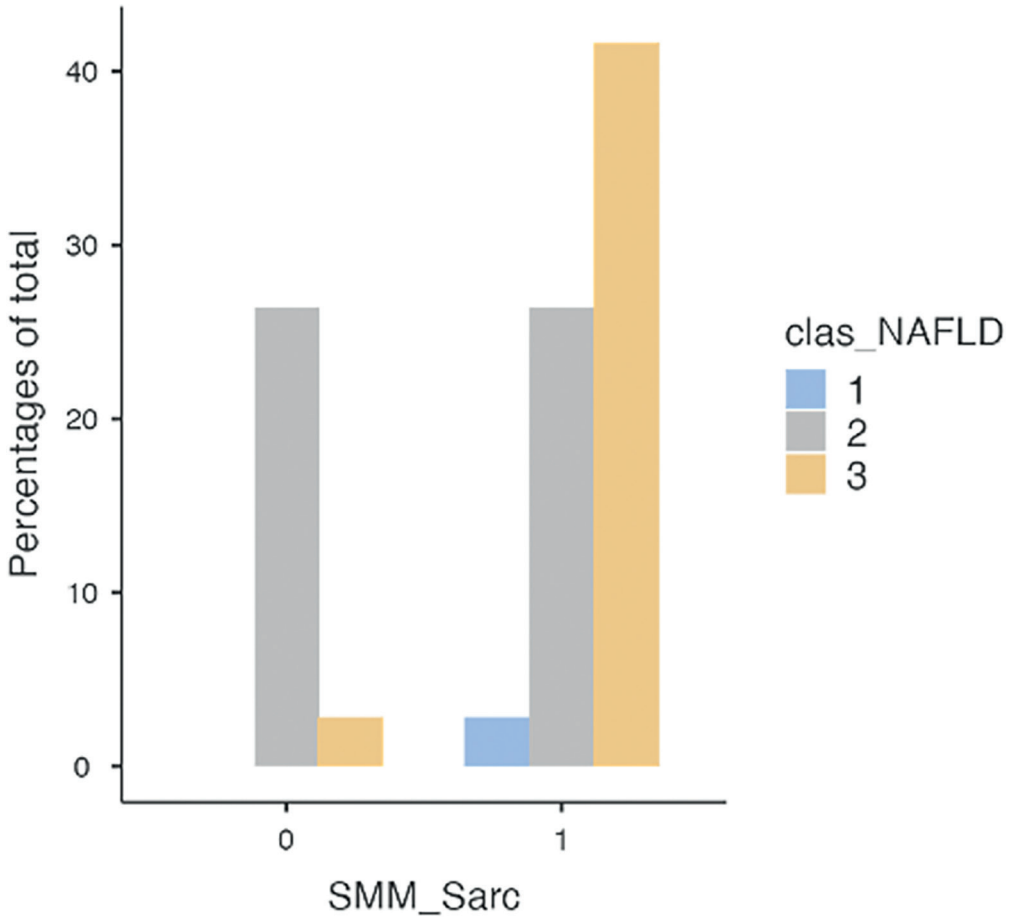


Fig. 1. NAFLD classification by low or high muscle mass.

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Tab. 1. Sarcopenic Obesity criteria.

Variable	Category	Count (n)	Percentage (%)
Sarcopenic Obesity ESPEN/EASO	No	63	95.5%
	Yes	**3**	**4.5%**
ESPEN/EASO Crieteria			
Screening: Obesity by BMI (BMI > 30) and sarcopenia risk.	**Yes**	**65**	**100.0%**
1. Low Muscle Mass (SMM/KG)	No	21	28.4%
	Yes	**53**	**71.6%**
2. Functional tests (one of the three)			
Dynapenia (Handgrip Strength)	No	64	95.5%
	Yes	**3**	**4.5%**
30-Second Chair Stand Test	No	64	97.0%
	Yes	**2**	**3.0%**
5STS (Five Times Sit-to-Stand)	No	52	98.1%
	Yes	**1**	**1.9%**
3. High Fat Mass (FM%)	No	6	8.0%
	Yes	**69**	**92.0%**

Sarcopenic Obesity criteria

Tab. 2. NAFLD Clasificación.

NAFLD Classification	Normal Muscle Mass	Low Muscle Mass	% of Total
Grade 1	0 (0.0%)	2 (2.8%)	2.8%
Grade 2	19 (26.4%)	19 (26.4%)	52.8%
Grade 3	2 (2.8%)	30 (41.7%)	44.4%
Total	21 (29.2%)	51 (70.8%)	100.0%

NAFLD Clasificación

Objective: To determine the association between low muscle mass (as defined by SMM criteria) and the severity of NAFLD, using statistical analysis.
Methods: This cross-sectional study included 74 individuals classified based on SMM (0: normal muscle mass; 1: low muscle mass). NAFLD was classified into three categories (1, 2, and 3) based on clinical data. A contingency table was used to analyze the distribution of NAFLD across SMM groups, and Fisher's exact test was applied to assess statistical significance.
Results: Of the 75 participants, 100% presented with obesity (BMI >30) and sarcopenia risk. Low muscle mass was observed in 71.6% of the population, demonstrating its high prevalence. Despite this, sarcopenic obesity (defined by ESPEN/EASO) was detected in only 4.5% of participants, while dynapenia (reduced handgrip strength) was also identified in 4.5%. High fat mass was present in 92% of individuals, indicating a predominant adiposity profile.Functional performance assessments showed limited capacity, with only 3% meeting the criteria for the 30-second chair stand test and 1.9% for the 5STS test (table 1).
Among those with low muscle mass, 58.8% had severe NAFLD (grade 3), compared to 9.5% of individuals with normal muscle mass (figure 1). The association between low muscle mass and NAFLD severity was statistically significant (Fisher's exact test, $p < 0.001$) (table 2). These findings highlight the metabolic and functional challenges in this population, emphasizing the health risks associated with reduced muscle mass.
Conclusions: Low muscle mass is significantly associated with greater severity of NAFLD in obese individuals. These findings highlight the importance of assessing muscle mass to better understand and manage metabolic risks in this population.

PO4.357

Reference values of lean mass index of upper and lower limbs in a sample of Spanish women with overweight: a cross sectional study

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Introduction: Deep phonotyping of body composition in overweight will contribute to the development of precisión nutrition and physical activity interventions. Appendicular Lean Mass (ALM) is positively correlated with functional independence and quality of life and negatively associated with cognitive impairment (3) and morbidity and mortality (4). The ESPEN/EASO Consensus Statement defines Sarcopenic Obesity (OS) as

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the coexistence of an increase percentage of Fat Mass (FM) and a decrease in both the amount of Lean Mass (LM), estimated by DEXA or BIA and its quality, monitored through functional tests (HGS for the Upper Limbs -UL-and chair test for the Lower Limbs -LL- to assess handgrip strength and knee extensor, respectively) (5). There is no standardized definition and universally accepted cut-off points for OS (6). Furthermore, definitions of sarcopenia are based on ALM or other surrogates of total LM, which do not discriminate between those of the UL and LL (7). The aim of this study is to determinate the reference values of LM Index (LMI) for UL (LMIUL) and LL (LMILL) in a sample of Spanish women with overweight and to calculate the prevalence of low LMUL and LMLL.

Methods: Cross-sectional study. Series of consecutive cases. Inclusion criteria: women aged >18 years, with overweight (30≤%FM<40) or obesity (%FM≥40) and 0.36<Edema Index (EI)<0.39. Height (SECA 222) and body composition (BIA Inbody 770) were measured. Normality tests (graphical methods and statistical tests) were applied. Normal variables are expressed as $\bar{x}$ ± SD and non-normally distributed variables as Mdna(IQR). Sextiles of LMUL=LMra+LMla, LMLL=LMrl+LMll, LMIUL=LMUL/T2 and LMILL= LMLL/T2. Low LMUL and LMLL were defined as LMIUL/LMILL≤P10. SPPS (V. 25) was used.

Tab. 1. Descriptive statistics of the variables at baseline conditions.

Variable	$\bar{x}$ ± SD/ Mdna (IQR)
Age (years)	45±12
Wt (kg)	77 (17.6)
Ht (m)	1.62 (0.09)
BMI (kg/m2)	29.4 (6.9)
%FM	42.5 (9.7)
FM (kg)	32.4 (14.1)
EI	0.381 (0.01)
FFM	44.3 (7.5)
FFMI (kg/m2)	16.93±1.59
LM (kg)	41.7 (7.1)
LMI (kg/m2)	15.96±1.52
ALM	18.32 (3.86)
ALMI (kg/m2)	7.03±0.72
LMra (kg)	2.34 (0.55)
LMla (kg)	2.31 (0.55)
LMUL (kg)	4.65 (1.1)
LMIUL (kg)	1.78 (0.38)
LMrl (kg)	6.86 (1.39)
LMll (kg)	6.86 (1.39)
LMLL (kg)	13.7 (2.79)
LMILL (kg)	5.23±0.49
SMM	24.3 (4.4)
SMMI (kg/m2)	9.27±0.98

SD: Standard Deviation; Mdna: median; IQR: Interquartile Range; Wt: Weight; Ht: Height; BMI; Body Mass Index; FM: Fat Mass; EI: Edema Index; FFM: Fat-Free Mass; FFMI: Fat-Free Mass Index; LM: Lean Mass; LMI: Lean Mass Index; ALM: Apendicular Lean Mass; ALMI: Apendicular Lean Mass Index; LMra: Lean mass right arm; LMla: Lean Mass left arm; LMUL: Lean Mass of Upper Limbs; LMIUL: Lean Mass Index of Upper Limbs; LMrl: Lean Mass right left.; LMll: Lean Mass left leg.; LMLL: Lean Mass of Lower Limbs; LMILL: Lean Mass Index of Lower Limbs; SMM: Skeletal Muscle Mass; SMMI: Skeletal Muscle Mass Index.

Tab. 2. Sextiles for FFM and its surrogates in Spanish women with overweight.

Variable	P10	P25	P50	P75	P90
FFM (kg)	38.1	40.8	44.25	48.3	52.47
FFMI (kg/m2)	14.92	15.78	16.87	17.89	19.06
LM (kg)	35.9	38.4	41.65	45.5	49.37
LMI (kg/m2)	14.04	14.84	15.9	16.86	18.05
ALM	15.34	16.54	18.32	20.42	22.42
ALMI (kg/m2)	6,12	6.53	6.99	7.51	7.98
LMra (kg)	1.88	2.09	2.33	2.64	2.96
LMla (kg)	1.84	2.04	2.31	2.6	2.9
LMUL (kg)	3.75	4.13	4.64	5.25	5.89
LMIUL (kg/m2)	1.43	1.59	1.78	1.97	2.2
LMrl (kg)	5.8	6.2	6.85	7.58	8.23
LMll (kg)	5.75	6.13	6.86	7.54	8.3
LMLL (kg)	11.51	12.34	13.67	15.12	16.49
LMILL (kg/m2)	4.62	4.88	5.2	5.58	5.9
SMM (kg)	20.5	22.2	24.3	26.6	29.1
SMMI (kg/m2)	8.07	8.54	9.23	9.85	10.63

P: Percentile; FFM: Fat-Free Mass; FFMI: Fat-Free Mass Index; LM: Lean Mass; LMI: Lean Mass Index; ALM: Apendicular Lean Mass; ALMI: Apendicular Lean Mass Index; LMra: Lean mass right arm; LMla: Lean Mass left arm; LMUL: Lean Mass of Upper Limbs; LMIUL: Lean Mass Index of Upper Limbs; LMrl: Lean Mass right left.; LMll: Lean Mass left leg.; LMLL: Lean Mass of Lower Limbs; LMILL: Lean Mass Index of Lower Limbs; SMM: Skeletal Muscle Mass; SMMI: Skeletal Muscle Mass Index.

Results: n=372. All variables except for FFMI, LMI, ALMI, LMILL and SMMI follow a non-normal distribution. Age=45±12 years; weight=77 (17.6) kg; height=1.62 (0.09) m; BMI=29.4 (6.9) kg/m2 %FM=42.5 (9.7); EI=0.381 (0.01); FFM=44.3 (7.5) kg; FFMI=16.93±1.59 kg/m2; LM=41.7 (7.1) kg; LMI=15.96±1.52 kg/m2; ALM=18.32 (3.86) kg; ALMI=7.03±0.72 kg/m2; LMra=2.34 (0.55) kg (1.88; 2.09; 2.33; 2.64; 2.96); LMla=2.31 (0.55) kg (1.84; 2.04; 2.31; 2.6; 2.9); LMrl=6.86 (1.39) kg (5.8; 6.2; 6.85; 7.58; 8.23); LMll=6.86 (1.39) kg (5.75; 6.13; 6.86; 7.54; 8.3); LMUL=4.65 (1.1) kg (3.75; 4.13; 4.64; 5.25; 5.89); LMIUL=1.78 (0.38) kg/m2 (1.43; 1.59; 1.78; 1.97; 2.2); LMLL=13.7 (2.79) kg (11.51; 12.34; 13.67; 15.12; 16.49); LMILL=5.23±0.49 kg/m2 (4.62; 4.88; 5.2; 5.58; 5.9). 9.7% (n=36) of the sample has low LMUL and another 9.7% has low LMLL.

Conclusions: The prevalence of low LMUL and LMLL was 9,7% in both cases. An extensión of the sarcopenia and SO definitions is proposed, integrating cut-off points for LMIUL and LMILL. In this way, it is possible to discriminate whether the reduction in LM originates from the UL or LL. This will allow for the prescription of personalized exercise and the monitoring of limb responses to diet and physical activity.

PO4.358

Physical Activity Modulate Obesity Risk of FTO rs9939609 predisposed carriers

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Background: The *FTO* SNP rs9939609 has been associated with obesity risk, with homozygosity for the risk allele (AA) conferring increased susceptibility. This study aimed to replicate the association and to explore the interaction between WHO-recommended threshold of physical activity (PA) levels and *FTO* rs9939609 carriers in relation to obesity.

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Methods: 5,824 participants genotype data for the *FTO* rs9939609 and PA data, which were collected via an online questionnaire were analyzed. PA was categorized as ≥150 min/week or <150 minutes/week. Logistic regression models were employed to study interaction and association.
Results: Participants homozygous for the risk allele (AA) exhibited a significant increase in obesity risk compared to heterozygous (AT) and wild-type (TT) carriers adjusting for age, sex and type 2 diabetes mellitus (T2DM) (OR = 1.14, 95% CI: 1.01–1.3, p = 0.038). An interaction between *FTO* rs9939609 genotype and PA level (≥150 minutes/week) demonstrated a protective effect against genetic predisposition to obesity (OR = 0.71, 95% CI: 0.6–0.83, p < 0.00001).
In individuals performing PA < 150 minutes/week, 61.6% of non-homozygous carriers (TT/AT) had obesity, compared to 67.1% of homozygous carriers (AA) (χ^2 = 7.131, p = 0.008). Among homozygous carriers (AA), 47.1% anticipating in PA≥150 minutes/week had obesity, compared to 67.1% of their less active/sedentary (<150 min/week) counterparts (χ^2 = 58.377, p= 2.58e-14).
Conclusions: Homozygosity for the *FTO* rs9939609 risk allele increases obesity risk. Adherence to recommended PA levels (≥150 minutes/week) significantly mitigates this risk, whereas insufficient PA exacerbates it. These findings emphasize the critical role of lifestyle interventions in individuals genetically predisposed to obesity.

Conflict of Interest: R.B is a scientific advisor of MyGenes

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PO4.359

Carbohydrate Intake Predicts Long-term Weight Loss Maintenance: the MedWeight study 5-year follow up

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Introduction: Scarce reports exist on the predictive ability of dietary intake for maintenance of the lost weight beyond 1 year after significant weight loss. We aimed to examine whether dietary intake during enrolment in the MedWeight registry may predict 5-year weight loss outcomes.
Methods: The MedWeight study is an online registry of adults 18-65 years old with a history of BMI≥ 25kg/m2 and ≥10% weight loss, ≥12 months prior to enrolment. Based on enrolment weight, volunteers are automatically classified as maintainers (current weight ≤90% max weight), or regainers. Volunteers completed questionnaires on demographics, weight history, lifestyle and psychological domains. Dietary intake was assessed by 2, non-consecutive, telephone 24-hour recalls, and analysed in terms of energy and macronutrient intake. Sampling was initiated in 12/2012. For the purposes of the 5-year follow-up (initiated 03/2018), volunteers enrolled 4.5-5.5 years before initiation were contacted, and asked to provide their weight. Based on follow-up weight, baseline maintainers were classified as long-term maintainers (follow-up weight ≤90% max weight), or else as ex-maintainers. Baseline regainers were excluded from this analysis. Differences in baseline measures by follow-up weight loss outcome were examined with independent samples test. The ability of baseline dietary intake measures to predict 5-year weight loss maintenance was examined with logistic regression (dependent variable: long-term weight loss maintenance).
Results: A total of 194 adults (61.9% women, age 37.1±10.3 years) were followed up for 5.2±0.9 years. Long-term weight loss maintenance was 71.6%. At baseline, long-term maintainers reported similar maximum BMI with ex-maintainers, but greater initial weight loss (26.8±8.3 vs. 19.9±6.4%, p<0.001), greater maintained loss (22.9±8.6 vs. 15.8±5.7%, p<0.001), and longer maintenance duration prior to study entry [3.6 (1.9, 7.2) vs. 2.4 (1.4, 4.8) years, p=0.008]. At follow up, long-term maintainers reported higher maintained weight loss [18.9 (14.9, 25.3) vs. 4.4 (0.0, 7.9) % of maximum weight, p<0.001). At baseline, both groups reported similar energy, lipid and protein intake. However, long-term maintainers reported greater intake of carbohydrates (45.3±9.5 vs. 41.9±9.0% energy intake, p=0.025), and marginally greater intake of dietary fiber [16.6 (11.8, 23.8) vs. 14.7 (10.6, 21.0) g, p=0.064)]. Higher carbohydrate intake (per each additional 1% of energy intake) predicted increased odds for 5-year weight loss maintenance in the crude model as well as the model adjusted for sex, age, initial weight loss, energy intake and physical activity energy expenditure (adjOR=1.07, 95%CI 1.02, 1.12, p=0.004). Similar results were produced for dietary fiber intake (adjOR=1.05, 95%CI 1.01, 1.11, p=0.047).
Conclusion: Higher carbohydrate and dietary fiber intake emerged as significant predictors of of 5-year weight loss maintenance. Our results highlight novel targets for dietary planning following significant weight loss.

PO4.360

Baseline Psychological Health Predicts Psychological Responses to Exercise among Adolescents with Obesity: Results from the HEARTY Randomized Controlled Trial

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Introduction: Adolescents with obesity present with a range of adverse physical and psychological health conditions associated with their higher weight. Although exercise interventions are commonly recommended to manage obesity, depressed mood and impaired psychological well-being, t he extent to which prior psychological health influences the intervention psychological responses remains uncertain. This study examined whether the psychological health effects of an exercise intervention are moderated by baseline psychological health among adolescents with obesity.
Methods: In this six-month randomized-controlled trial, 304 post-pubertal adolescents with obesity (70% females, 14–18 years) received dietary counseling with a daily energy deficit of 250 kcal. Participants were randomized into four groups: non-exercising (daily energy deficit only) control (n = 76), aerobic training (n = 75), resistance training (n = 78), or combined aerobic and resistance training (n = 75). Psychological health outcomes were measured using the Brunel Mood Scale (anger, confusion, depression, fatigue, tension, and vigor) and the Children's Depression Inventory (CDI) subscales (negative mood, interpersonal problems, ineffectiveness, anhedonia, and negative self-esteem) at baseline and 6-months of intervention. Mixed linear models were applied to analyse whether baseline levels of each subscale moderated the between-group changes for that same subscale. Given no significant differences emerged by exercise training groups, all exercise groups were combined into a single intervention group for analysis. Outcomes were modeled as a function of time (baseline vs. follow-up), condition (control vs. intervention), baseline outcome levels, and their interaction terms. Each moderator (baseline level) was assessed as a continuous predictor, testing linear or non-linear effects via cubic splines. Effect sizes were expressed as standardized coefficients.
Results: Moderation analysis revealed that the intervention effects varied according to the psychological condition of participants at baseline. Comparing exercise intervention group relative to controls, participants with poorer psychological health at baseline showed greater reductions in the mood subscales for confusion (β = −0.26, p = 0.028), depression (β = −0.25, p = 0.048), fatigue (β = −0.35, p = 0.003), and the CDI subscale for interpersonal problems (β = −0.28, p = 0.007) compared to those with more favourable baseline profiles (lower scores) on these indicators.

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Conclusions: Baseline levels of psychological health moderated the effects of 6-month exercise intervention in adolescents with obesity, whereby those with greater mood and interpersonal problems derived greater psychological benefits. These findings highlight the importance of applying a person-centred approach for tailoring interventions. By identifying which adolescents respond most favorably, researchers and clinicians can better address both physical and psychological health needs in this high-risk population.

PO4.361

Dieticians' experiences with implementing an intensive weight loss program in Danish municipalities – preliminary findings from the LightCOM trials

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Introduction: The Lighthouse Consortium on Obesity Management (LightCOM) trials were developed to test an intensive weight loss (IWL) program for people living with obesity. The IWL program offers an individualized combination of total dietary replacement, behavioral support, physical activity and (potentially) treatment with weight loss medication (WLM). The IWL program is situated in three Danish municipalities and performed primarily by dieticians.
Alongside the trials testing the effectiveness of the IWL, our research group will perform a process evaluation investigating the barriers and facilitators of implementing the program. This presentation focuses on the dieticians' experiences with performing intervention activities.
Methods: Approximately 10 qualitative interviews will be conducted with dieticians from each of the three municipalities performing the IWL program. Interviews will last around 60 minutes and be based on a semi-structured topic guide developed by the author group. The data analysis will be founded in thematic analysis using Normalization Process Theory as a backdrop. Interview participants will sign a written consent form prior to the interviews
Findings: The findings will identify barriers and challenges of implementing the IWL program in the municipalities from the dieticians' perspectives. We will mainly focus on how dieticians distinguish their work in the IWL program from their usual practice with specific attention to WLM and how this affects the ways in which they perform intervention activities as well as their engagement with the intervention.
Discussion: We hope to engage the audience in the discussion of our preliminary findings and the methodology used for the study. This will be used as inspiration when we move forward with the interpretations of our data material.

PO4.362

Bio-anthropometric indices of insulin resistance predict arterial hypertension and 24-hour blood pressure control in patients with hypertension

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Introduction: Insulin resistance (IR), a dysmetabolic condition linked to visceral adiposity, promotes dyslipidemia and elevated blood pressure (BP) through various mechanisms. While the homeostatic model assessment (HOMA) is commonly used to quantify IR, alternative bio-anthropometric indices derived from routine anthropometric and metabolic parameters, such as TG/HDL-C, TyGi, TyGi-BMI, TyGi-WC, LAP, VAI, and METS-IR, have been validated against HOMA. Some indices have shown associations with hypertension risk and poor BP control evaluated using office BP (OBP). However, their relationships with 24-hour ambulatory BP (ABP) and antihypertensive treatments remain unexplored. This study investigates the association between bio-anthropometric indices of IR and ABP in outpatients with hypertension but without diabetes mellitus.
Methods: This observational cross-sectional study included 1,336 outpatients assessed for hypertension using ABP monitoring. Various IR indices were calculated, and when present antihypertensive therapy was evaluated using the number of medications and the treatment intensity score (TIS). Multivariate logistic regression models analysed the association between IR index quartiles and the prevalence of hypertension or uncontrolled 24-hour ABP. Subgroup analyses considered lipid-lowering therapy (LLT), sex, and age. A likelihood ratio test was used to assess the non-linearity of the association between the IR surrogate indexes and the outcome. And restricted cubic splines (RCS) analyses were performed to model non-linear relationship between the IR surrogate indexes and the odds of uncontrolled 24-hour BP.
Results: The cohort had a mean age of 54.9 years (58.3% male), with a mean BMI of 27.4 kg/m^2. Median values of key indices included TG/HDL-C (2.07), TyGi-BMI (234.9), TyGi-WC (832.8), LAP (41.4), VAI (71.3), and METS-IR (41). Uncontrolled ABP was observed in 64.2% of patients. Patients with uncontrolled ABP were younger, predominantly male, and exhibited higher IR indices. In both adjusted and unadjusted models, higher METS-IR and TyGi-BMI quartiles were independently associated with uncontrolled ABP. Sensitivity analyses confirmed these associations regardless of LLT, sex, and age.
Conclusion: METS-IR and TyGi-BMI were the strongest predictors of uncontrolled ABP, independent of treatment status, LLT, sex, and age. These indices, derived from widely available parameters, offer practical tools for identifying patients with increased hypertension risk in real-life clinical settings.

PO4.363

Effect of semaglutide treatment on biopsy-free scoring systems for MASLD in pacients with obesity

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Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD) is defined as the presence of hepatic steatosis (verified through imaging techniques and/or liver biopsy) and at least one between these three conditions: type 2 diabetes mellitus, obesity and metabolic dysregulation. The prevalence of MAFLD is steadily increasing and may become the leading cause of chronic liver disease in the coming decades. A key role in the treatment of MAFLD is lifestyle modification and the introduction of measures aimed at reducing body weight. Thanks to advancements in the obesity treatment new medications are being tested. In previous studies long-acting GLP-1 receptor agonist semaglutide was associated with improvement in transaminases and MASLD scores.
Objective: Our aim was to evaluate the effectiveness of a long-acting GLP-1 RA semaglutide in patients with obesity and MASLD, predominantly it's impact on biopsy free scoring systems in mentioned patients
Methods: We conducted prospective, observational, post-marketing study. Our research included 30 patients (21 women, 9 men) with obesity, mean (SD) age being 47 (14) years, mean (SD) BMI was 39.7 (5.78). All patients were treated with semaglutide at initial dose of 0.25 mg s.c. weekly, which was uptitrated over the course of 6 months. Patients received submaximal doses of semaglutide ranging from 0.25 mg to 1.5 mg s.c. weekly. From the beginning they were instructed on lifestyle modifications. Before the treatment initiation and after 6 months od treatment parameters neccesary for biopsy free scoring systems (Fib-4, SAFE, BARD, NAFLD Fibrosis Score, Fatty Liver Index, Hepatic Steatosis Index) were established.

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Results: In our study we observed significant decrease in Fatty Liver Index (p< 0.001), Hepatic Steatosis Index (p <0.001) and SAFE score (p <0.033). Mean (SD) Fatty Liver Index before starting treatment was 92.4 (9.85), mean (SD) Hepatic Steatosis Index before starting treatment was 50.7 (6.78) and mean (SD) SAFE score before starting treatment was 30.8 (80.7). Mean (SD) Fatty Liver Index after 6-months of treatment was 75.3 (21.0), mean (SD) Hepatic Steatosis Index after 6-months of treatment was 45.0 (6.42) and mean (SD) SAFE index after 6-months of treatment was 11.2 (81.6). Changes in remaining biopsy free scoring systems BARD, Fib-4, NAFLD Fibrosis Score were non- significant, p values being 0.501 for BARD, 0.303 for Fib-4 and 0.503 for NAFLD Fibrosis Score
Conclusion: In our group of patients treatment with submaximal doses of semaglutide was associated with improvement in Fatty Liver Index, Hepatic Steatosis Index and SAFE biopsy free scoring systems. Changes in BARD, Fib-4, NAFLD Fibrosis Score were non significant. Treatment with semaglutide was well tolerated without severe adverse effects. Further studies with greater sample sizes and longer periods of follow-up are required to support the effectiveness of semaglutide in MASLD.

Conflict of Interest: None Disclosed

Funding: The study was conducted as part of the Long-Term strategic research of prevention, intervention and mechanisms of obesity and its comorbidities (Project code in ITMS 2014+: 313011V344)

PO4.364

Real-world data on the efficacy of oral semaglutide on anthropometric and body composition parameters in patients with obesity

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Introduction: Obesity is a chronic and relapsing disease with limited pharmacological options until recent years. Glucagon-like peptide 1 (GLP-1) receptor agonists are effective treatment options for achieving weight control in patients with overweight and obesity. In Spain, during the liraglutide shortage, oral semaglutide was used as an off-label indication to continue the treatment of these patients. In this sense, in the PIONEER clinical trials program, oral semaglutide provided superior reductions in body weight compared with placebo (-2,3kg with 14mg) in patients with type 2 diabetes.
Objectives: Evaluate the effect of oral semaglutide in a sample of patients with obesity on weight and body composition parameters.
Methods: 50 patients with obesity (76% women, age 53.1±13.5 years, BMI 30.6±2.4kg/m^2) treated with oral semaglutide over a 3-month period. Baseline and 3-month anthropometric and body composition parameters data were collected.
Results: After 3 months of treatment with oral semaglutide significant weight loss in kg (98.5±17.3 vs 92.6±17.2kg; p<0.001) and BMI reduction (35.9±5,9 vs 33.7±6 kg/m2; p<0.001) were found. Similarly, waist circumference reduction (103±7,3 vs 99,4±7,1cm; p<0.001) visceral fat reduction index (16,4±4,9 vs 12,8±4,3; p<0,001), fat mass loss both in percentage (48.8±7.8% vs. 43.7±7.2%; p=0.011) and in kg (44±11.8 vs. 38±11.6kg; p<0.001) were significantly greater. However, muscle mass reduction in Kg (33.2±7.1 vs. 32.1±7kg; p=0.006) were also found.
Conclusions: Oral semaglutide reduced body weight, BMI, visceral fat, fat mass, waist circumference. The weight reduction was greater than in individuals with diabetes, according to the results of PIONEER 1 trial. Adequate monitoring is essential as well as sufficient protein intake and physical activity to avoid loss of muscle mass.

PO4.365

Real-world evaluation of the effects of tirzepatide in patients with complex obesity in Spanish population

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Introduction: Tirzepatide (TZP) is a first-in-class first dual GIP/GLP-1 receptor co-agonist approved for treatment of adults with obesity. Several endocrine disorders, including diabetes, hypothyroidism, polycystic ovarian syndrome, hypogonadism or menopause are associated with obesity. The aim of this study was to assess the efficacy, safety, and tolerability of TZP in this subgroup of patient with complex obesity. Body composition, anthropometric measures of total and central fat distribution and cardiovascular risk factors (CVRFs) were measured.
Methods: Prospective observational study of comprehensively phenotyped subjects with complex obesity associated to endocrine disorders from a university hospital who received at least 12 weeks of continuous TZP treatment. The primary outcomes were changes in body weight, anthropometric measurements and body composition following TZP treatment. The impact of different CVRF and endocrine disorders on different outcomes were studied. A sub-analysis was made between those patients who were GLP1-RA naïve compared to patients switched from GLP1-RA to TZP.
Results: 82 patients were evaluated. 66 were females. Mean age 48.6±12.4. 68% had ≥2 CVRFs and 32% ≥4. TZP treatment resulted in a mean reduction in body weight of 7.5± 5.1 kg, weight loss percentage of 7± 4.3 and BMI of 2.7±1.8 kg/m2. 72% of subject lost ≥5% of body weight, 17% lost ≥10%, 8.5% lost ≥15% and 2.1 lost ≥20% at 12 weeks treatment period. Improvements in body composition and adipose tissue distribution were seen with a mean reduction waist circumference (WC) of 12.9± 14.7 cm, neck circumference (NC) of 2.3±1.6, waist-to-height ratio (WtHR) of 0.6± 0.1 and in fat mass percentage 4.3± 4.3 with increase in fat free mass 4.5± 6.3 kg. No differences were found in weight loss between men and women, however, men showed greater reduction in WC (23.8vs11.2; p=0.03), WtHR (0.73±0.63; p=0.019) and NC (3.9vs2.0; p=0.005).
No significant differences on TZP efficacy were found on weight loss or fat mass between those with endocrine disorders including, hypothyroidism, diabetes, hypothyroidism, polycystic ovarian syndrome, hypogonadism or without. When adjusting by CVRF, those subjects with MAFLD had less weight loss impact as compared with those without (5.3vs7.6%; p=0.025). Menopause women exerted less total weight loss (5.9vs9.1; p=0.018). Greater weight loss was observed in patients without prior GLP1-RA treatment compared to those switched to TZP from GLP1-RA. Mild gastrointestinal disorders were the most common side-effects. 4 subjects discontinued treatments (1 due to gastrointestinal side-effects, 1 unable to attend further study visits, 2 due to economic concerns).
Conclusions: In a real-world population of Spanish patients with complex obesity, TZP was associated with clinically and statistically significant reductions in body weight, fat mass and anthropometric measurements of central fat distribution. Greater reductions in body weight were observed among patients who were GLP1-RA naïve compared to patients switched from GLP1-RA to tirzepatide. The presence of MAFLD or menopause could minimize the impact of TZP on weight loss.

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PO4.366

Portal Hypertension Evaluation in Patients with Severe Obesity Prior to Bariatric Surgery: A Cross-Sectional Analysis of Hemodynamic, Radiological, and Histopathological Data

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Introduction: Obesity is the major contributor for developing non-alcoholic fatty liver disease (NAFLD). The progression of portal hypertension (PHT) leads to hyperdynamic circulation and clinical complications such as esophageal varices, encephalopathy and renal impairment. In NAFLD, hepatic decompensation may occur at earlier stages than in other chronic liver diseases. The gold standard method for diagnosing PHT is the measurement of hepatic venous pressure gradient (HVPG), an invasive procedure. Previous studies have suggested that in patients with severe obesity (SO) the degree of fibrosis does not correlate with PHT. However, the prevalence of PHT in patients with SO is not yet well established, and we currently lack non-invasive tools to assess PHT.
Objectives: Evaluate the hemodynamic profile of portal circulation in patients with SO and examine the relationship between portal hypertension (PHT) and histological, clinical, and ultrasound characteristics.
Methods: This is a single-center cross-sectional study including patients with SO eligible for bariatric surgery (BMI >35 kg/m² with comorbidities or >40 kg/m²) who were followed up at the Obesity Unit of Vall d'Hebron University Hospital from May 2022 to January 2024. Procedures included: a complete medical history, anthropometric measurements, blood tests, liver stiffness measurement (LSM) via FibroScan, PHT assessment using HVPG, and transjugular liver biopsy with evaluation of fibrosis, steatosis, and inflammation.
Results: A total of 40 patients were recruited, 62,5% were women, with a mean age of 48,9±10,01 years and a mean BMI of 45,68±6,19 kg/m². Subclinical PHT (HVPG >5 mmHg <10 mmHg) was identified in 8 patients (20%). LSM >7,5 kPa was observed in 24 patients (60%), and significant fibrosis (≥F2) in 7 patients (17,5%). No significant differences were found in FibroScan parameters between the PHT and non-PHT groups for LSM (12,11 ± 5,85 kPa vs. 12,57 ± 8,52 kPa, p = 0.88) or CAP (320,88 ± 58,32 dB/m vs. 326,27 ± 54,74 dB/m, p = 0.81). Similar results were observed between HVPG and fibrosis stage (p = 0.38). However, a significant difference was noted in the FIB-4 score between patients with PHT and those without (1,4 ± 0,63 vs. 0,87 ± 0,40, p = 0.01). Among patients with PHT, 50% had no fibrosis (F0) based on biopsy, and 44% of patients with elevated LSM showed no fibrosis.
Conclusions: In this cohort, 20% of patients with severe obesity presented portal hypertension. Notably, 50% of those with PHT had no fibrosis on biopsy, and no correlation was identified between PHT parameters, LSM, and liver biopsy findings. The significant difference in FIB-4 scores between PHT and non-PHT patients highlights its potential as a non-invasive diagnostic tool for PHT in patients with SO. Further research is warranted to validate these findings.

Conflict of Interest: None disclosed.

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PO4.367

Weight Bias Internalization Inversely Associates with Adherence to the Mediterranean Diet: Preliminary Findings from the Greek Lifestyle and Obesity Related Bias Survey

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Introduction: Weight bias internalization has been associated with various psychosocial outcomes and disordered eating, yet scarce reports exist on its relationship with dietary quality. We aimed to explore the relationship between weight bias internalization and adherence to the Mediterranean Diet (MeDi), in adults with a history of overweight or obesity.
Methods: The Greek Lifestyle and Obesity Related Bias Survey is an online, cross-sectional study, aiming to explore the relationship between weight bias internalization and lifestyle measures among adults residing in Greece. Eligible volunteers are persons 18-65 years old, who report a maximum BMI ≥ 25 kg/m2. The study is hosted on RedCAP, and the link to the survey is circulated through digital means. Internalized weight stigma was assessed by the Modified Weight Bias Internalization Scale (WBIS-M) (11 items, score 11-77, higher score indicating greater weight bias internalization). Dietary intake was assessed with a validated 72-item FFQ. Adherence to the MeDi was assessed with the MedDietScore (score 0-55, higher score indicating higher MeDi adherence). Associations between variables and WBIS-M (raw score or tertiles) was assessed with General Linear Models and Linear Regression.
Results: A total of 233 individuals [74.2% women, 38 (23, 50) years old] participated in the study. Median BMI was 28.6 (25.5, 33.8) kg/m2; 38.2 and 39.5% of volunteers with overweight or obesity, respectively. Mean WBIS-M was 39.6±16.1, with women reporting greater scores than men (42.0±15.2 vs. 33.0±17.0, p<0.001). WBIS-M associated with current (rho=0.467, p=0.001) and maximum (rho=0.430, p=0.001) BMI. Median energy intake (EI) was 1843 (1478, 2483) kcal/d, breaking down to 35.5% (31.1, 39.0) of EI from carbohydrates, 17.8% (14.9, 20.0) from protein, 45.5 (40.8, 50.4) from fat, and 0.8 (0.0, 1.9) from alcohol. Median MedDietScore was 31 (27, 36). When tertiles of WBIS-M (by sex) were examined, participants in the highest WBIS-M tertile (vs. the lowest) were found to have higher BMI [34.3. (27.9, 41.5) vs. 26.2 (24.1, 28.8), p<0.001]. Referent to dietary intake, while no differences in total energy intake were noted (p=0.064), participants in the highest WBIS-M quartile (vs. the lowest), reported lower protein intake [0.8 (0.5, 1.2) vs. 1.1 (0.8, 1.3) g/kg, p=0.002], higher saturated fat intake [13.4 (11.8, 15.3) vs. 12.4 (11.1, 13.7) % energy, p=0.021] and lower adherence to the MeDi [28 (25, 33) vs. 33 (28, 37), p=0.001]. An inverse relationship between MeDi adherence and WBIS-M score was found in the crude and the model adjusted for age, sex, energy intake and BMI (adjB=-0.062, 95% CI -0.115, -0.008). Same results were produced when WBIS-M tertiles (by sex) were examined (adjB=-1.062, 95%CI -2.087, -0.036).
Conclusion: This study provides novel insight on the role of internalized weight bias as a deterrent against the adoption of a high-quality diet. Strategies to promote adherence to the MeDi may alleviate weight bias internalization.

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PO4.368

Socio-economic status and social participation in health economic modelling of obesity interventions – Findings from a systematic review

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Introduction: Health economic models inform decision-makers about best-practice obesity interventions and policies. Both health risk and intervention effects can differ by individual or neighbourhood socio-economic status (SES), impacting indirect and societal costs including social participation. This study aimed to identify socio-economic and social participation variables used in long-term economic models of obesity, and associated implications for economic evaluations of obesity interventions.
Methods: Following PRISMA guidelines, we conducted a systematic review of studies that model obesity-related outcomes of interventions over ≥ 20 years, searching seven databases in 2022. Two researchers independently screened titles/abstracts and reviewed full-texts in Rayyan; a third reviewer resolved conflicts. Two reviewers extracted data and assessed study quality. Extraction items included use of SES as a model input, reported intervention outcomes of individuals' participation and status in social life, and researcher notes on methodological and data challenges. Categorical data were synthesised quantitatively and challenges analysed narratively.
Results: Of 744 titles/abstracts screened, 185 full-text articles were reviewed and 80 studies included that modelled lifestyle (46%), medical (38%), regulatory (19%) or hypothetical (6%) interventions. Models from Australia (29%), USA (26%) and the UK (20%) dominated. Most studies analysed cost-effectiveness (91%) and applied a health system (60%) and/or societal perspective (48%). Few studies used SES as a model input (n=15, 19%) or reported participation outcomes (n=21, 26%).
The most frequent socio-economic input variable was education (n=7), followed by income (n=6) and a comprised SES score (n=5). Fewer studies integrated social class, neighbourhood deprivation, unemployment, occupation or poverty as model inputs.
Modelled SES and participation outcomes mostly concerned work productivity (i.e. presenteeism, n=10), absenteeism (n=7) or self-reported quality of life (n=7). Rarer outcomes were labour market productivity (e.g. unemployment), income, school attendance, school performance, early retirement or use of public transport.
Narrative analysis indicates that intervention studies insufficiently assess indirect and societal costs, and differences in treatment effect or intervention acceptability by SES group. Evidence is also missing from interventions in other sectors, such as agriculture, environment, built environment and trade, which likely influence obesity.
Conclusion: Only one quarter of models consider SES or social participation as model inputs or outcome. A variety of individual-, neighbourhood- or societal-level variables can be integrated in health economic models; however, standardised data collection and integration of these variables in economic evaluations is needed to build evidence of distributional cost-effectiveness. Modelling guidelines are required that set methodological standards and outcome measures. Multidisciplinary researchers at different stages of study planning and conduction should co-create these guidelines to maximise comprehensiveness and use.

PO4.369

"I didn't need more of the same I needed something different": Patients' reasons for declining participation in a randomised trial comparing an intensive weight loss programme with weight loss surgery

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Introduction: Weight loss surgery (WLS) is a transformative procedure often accompanied by bodily, social, and psychological changes (1-3). Research has shown that patients undergoing WLS frequently perceive WLS as a "medical necessity" (4) or "the only way out" (5) for achieving an improved quality of life when other options have been exhausted. They view WLS as a "tool" (6) that requires hard work to achieve and maintain weight loss, countering the stigma of obesity as self-inflicted due to a lack of self-discipline and the notion of obesity surgery as "the easy way out" or "cheating."
Historically, WLS has been the only effective long-term intervention for significant weight loss. However, the recent emergence of GLP-1 medications introduces a less invasive and reversible alternative, introducing a shift in the landscape of obesity treatment. This shift raises important questions about how candidates for WLS perceive and navigate the decision-making process in light of these new options. Our study aimed to explore patients' reasons for declining randomisation in a randomised trial (LightBAR) comparing an intensive weight loss programme with weight loss surgery.
Methods: Semi-structured telephone interviews were conducted with patients on the public waiting list for WLS in Denmark who declined to take part in the LightBAR trial. In total, twelve patients (seven women and five men) from two hospitals, one in the Capital Region and one in the Region of Southern Denmark, were recruited. Narrative analysis was used to analyse transcripts.
Results: The initial analysis indicates that many years of weight cycling due to diets and lifestyle changes, including weight loss medication, along with uncertainties around the random allocation process inherent to the clinical trial, increasing age, and worsening health or the prospect thereof, created a sense of urgency among the patients perceiving surgery as the only viable option.
Discussion: We will share results from the study and discuss their ethical, practical, and methodological implications.

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PO4.370

Maternal and perinatal outcomes in a Spanish cohort of pregnancies after bariatric surgery

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Introduction: Bariatric surgery (BS) has become more frequent among women of child-bearing age. Weight loss induced by BS has proved to reduce adverse maternal and perinatal outcomes such as gestational diabetes mellitus (GDM), pregnancy-associated hypertensive disorders (PAHD), macrosomia as well as secondary infertility, however, it has been associated with adverse perinatal outcomes such as intrauterine growth restriction, small-for-gestational-age (SGA) newborns, and preterm births.

Objective: Evaluate maternal and perinatal outcomes after BS.

Methods: We performed a retrospective, observational, multicenter study of women with BS undergoing preconceptional and gestational follow-up by the Endocrinology and Nutrition Departments in 5 Spanish hospitals between 2005 and 2023.

Results: A total of 207 pregnancies (4.8% twin gestation) in 161 women were analyzed. 85.5% were spontaneous gestations and 14.5% through Assisted Reproduction Techniques. Mean age at gestation was 34.6±4.8 years. Mean BMI prior to BS was 44.9±6.4 kg/m2. Mean pregestational BMI was 31.2±6 kg/m2. 54.4% had some degree of obesity at the pre-pregnancy time. Primary surgical techniques: 56% Roux-en-Y-Gastric Bypass (RYGB) and 42% Sleeve Gastrectomy (SG). Weight loss from surgery to pregnancy was 36.8±16% and mean time from BS to pregnancy was 48.4±41.7 months. In 12% of the cases, pregnancy occurred within 12 months after BS with no significant differences according to the type of surgical procedure. The median gestational weight gain (GWG) was 8.7±7.4kg (no significant differences between techniques).

GDM occurred in 30.1% (36.5% RYGB vs 20.6% SG, p=0.019), 52% were diagnosed through self-monitoring of capillary blood glucose and 48% through oral glucose tolerance tests, 69% received dietary treatment and 31 % received insulin therapy. 14% of the pregnant women experienced hypoglycemia (7 secondary to insulin therapy, 12 due to reactive hypoglycemia), PAHD occurred in 4.7% (0.9% RYGB vs 9.6% SG, p=0.011) and 2.4% developed preeclampsia. 40% suffered some nutritional deficiency during pregnancy, with no significant differences based on the type of surgery.

Delivery occurred at 38.3±3.1 weeks of gestation, with a mean newborn weight of 3007±630 g. 4.3 % was SGA (birth body weight< third percentile) and 4.3 % was large for gestational age (LGA> percentile 90). Preterm births were 12.5%. Cesarean section was required in 32.5 % of cases (23.8% RYGB vs 44.1% SG, p=0.004).

Regarding fetal adverse outcomes, there were 2.4% fetal malformations and 1.4 % fetal losses.

In comparison to women whose pregnancies occurred 1 year after BS, women whose pregnancies were before this period exhibited a significantly higher BMI (33.7±5.8 vs 30.8±5.8 kg/m2; p=0.02) and less GWG (1.5±11 kg vs 9.7±6.2 kg; p=0.0019).

Conclusion: pregnancy after BS should be considered a high risk pregnancy and requires strict and multidisciplinary follow-up in Endocrinology and Nutrition, Surgery and Obstetrics units.

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PO4.371

Effects of a high-intensity physical exercise session carried out during a 34-hour fasting period on energy metabolism in healthy adults

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Introduction: Physical exercise and fasting are two effective strategies for the prevention and treatment of metabolic diseases. However, it remains unclear whether their effects are synergistic or merely additive. This study investigates the changes in substrate oxidation, energy expenditure, and glucose metabolism following 24- and 34-hour fasting periods, both with and without physical exercise.

Methods: This ongoing, controlled, crossover experimental study aims to investigate the combined effects of fasting and physical exercise on energy metabolism. Five healthy adults (2 males, 3 females; age 28±5.24 years; BMI 24.54±2.01 kg/m^2) has completed so far the two 34-hour fasting conditions: one with physical exercise and one sedentary. Each condition included a standardized breakfast (0h), followed by either an exercise session or sedentary activity (6-10h), and assessments 24h and 34h after the standardized breakfast. The respiratory exchange ratio (RER), fat oxidation (FATox), carbohydrate oxidation (CHOox), and resting energy expenditure (REE) were measured using indirect calorimetry (Omnical, Maastricht Instruments Inc.). Protein oxidation (PROox) was estimated from urinary creatinine concentration. Blood samples were collected to measure glucose and insulin concentrations.

Results: The RER showed a consistent decrease, indicative of a shift towards greater fat oxidation, with no significant differences between the exercise and sedentary conditions (P≥0.068). Preliminary analysis revealed an upward trend in FATox after 24 and 34 hours of fasting, suggesting enhanced fat utilization over time, though the increase did not reach statistical significance (P≥0.068). Notably, this upward trend in fat oxidation became more pronounced at 34 hours of fasting, indicating a continued shift towards greater fat utilization (P≥0.068). CHOox and PROox displayed similar declining trends, again with no significant differences between the sedentary and exercise conditions (P≥0.465). Both glucose and insulin levels significantly decreased after 24 hours of fasting (-6.0 ± 4.9 mg/dl vs. -6.5 ± 6.25 mg/dl for glucose; -3.4 ± 3.64 µUI/ml vs. -4.08 ± 2.84 µUI/ml for insulin), without significant differences between the exercise and sedentary conditions (P≥0.157). At 34 hours, glucose levels continued to decline (-8.4 ± 36.16 mg/dl vs. -14.00 ± 14.4 mg/dl), while insulin levels showed a slight increase in the exercise condition, though this change was not statistically significant (P≥0.715).

Conclusions: These preliminary findings reflect a trend towards enhanced fat oxidation with prolonged fasting, potentially augmented by physical exercise. Despite the current sample size limits statistical power, the observed trends indicate that combining fasting with exercise may

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optimize metabolic flexibility, enhancing fat utilization and reducing reliance on carbohydrate stores. Ongoing data collection and further analysis with a larger cohort are expected to provide more definitive conclusions. If confirmed, these results could have significant implications for designing interventions aimed at improving metabolic health through lifestyle modifications.

PO4.372

Enhancing weight loss outcomes with GLP-1 medications: The role of AI-powered digital platforms and health coaches

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Introduction: The utilization of artificial intelligence (AI) in healthcare is transforming patient care, particularly for those undergoing weight loss treatments with GLP-1 medications. AI-powered digital platforms and health coaches offer personalized support, guidance, and monitoring, potentially enhancing treatment outcomes and patient adherence. This abstract explores the value of an AI-driven digital platform and health coach for patients taking GLP-1 medications for weight loss. The objective of this study was to assess the impact of an AI-powered digital platform and health coach on weight loss outcomes, adherence, and patient satisfaction among individuals prescribed GLP-1 medications for weight management.
Methods: A retrospective analysis was conducted using quantitative data from an AI-powered digital platform (Virtual Care Suite, Allurion Technologies, Natick, MA), including patients with obesity or overweight, who were prescribed GLP-1 medications (tirzepatide or semaglutide). Patients who had baseline, 3-, 6-, and 9-month weight measurements were included in the analysis. The AI platform provided personalized meal plans, exercise routines, medication reminders, and real-time feedback based on patient data. Data on weight loss (WL) and total body weight loss (TBWL) were collected. Results are expressed as mean ± standard deviation. Data analyses were conducted using SAS® version 9.4.
Results: Data were available for 43 patients (69.8% female), mean age 46.7±12.4 years, who were treated with GLP-1s and utilized the AI digital platform in 2024. Baseline weight and BMI were 98.3±13.5kg and 32.4±3.8kg/m2. At 3-, 6-, and 9-months following initiation of the GLP-1 treatment, mean WL and TBWL were 10.7±4.8kg and 10.9±4.4%, 15.5±5.8kg and 15.6±5.5%, and 17.1±6.3kg and 17.3±5.2%, respectively ($p<0.0001$) at each time point compared to baseline.
Conclusion: The findings highlight the potential benefits of incorporating an AI-powered digital platform and health coach into weight management programs for patients taking GLP-1 medications. Improved weight loss outcomes were observed compared to the real-world weight loss observed in US studies, which was 15.2% for tirzepatide and 7.9% for semaglutide at 12 months (Rodriguez et al., 2023), suggesting that AI-driven interventions can play a crucial role in augmenting traditional treatment methods. The AI platform's ability to provide real-time, tailored support helps address common barriers to weight loss, such as motivation, adherence, and lifestyle modifications.
In conclusion, integrating AI-powered digital platforms and health coaching into weight management regimens for patients on GLP-1 medications can significantly enhance treatment efficacy. Future research should explore long-term effects and the cost-effectiveness of such interventions to further validate their utility in clinical practice.

PO4.373

Bariatric surgery is associated with brown fat recruitment and reduced arterial inflammation in individuals with morbid obesity

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Introduction: Obesity is a chronic and progressive disease that occurs through an imbalance between energy intake and expenditure and is associated with increasing cardiometabolic morbidity and mortality. Bariatric surgery is emerging as an effective method to treat obesity and obtain sustainable weight loss and is associated with reduced cardiovascular events. Yet not all patients with obesity develop cardiovascular and metabolic complications. Recent findings suggest that morbidly obese individuals do possess active brown adipose tissue (BAT) and active BAT is linked to a healthier metabolic phenotype in obesity.
Materials-Methods: 32 morbidly obese participants enrolled in a prospective imaging study underwent 18F-FDG PET/CT imaging after BAT activation through mild cold exposure before and one year after bariatric surgery. BAT was segmented according to the BARCIST criteria. The arterial inflammation was assessed in accordance with the EANM guidelines.
Results: Prior to bariatric surgery, 28% of the participants showed active BAT; these individuals showed significant less arterial inflammation as compared to BAT negative individuals ($p<0.001$). One year after bariatric surgery, 53% of the study participants had active BAT. More importantly, we observed a dramatic decrease in arterial inflammation in the entire study cohort which was steeper in the BAT negative cohort compared to the BAT positive cohort in which the already low values remained almost stable. Interestingly, after bariatric surgery, there were no differences present in the target to background ratios (TBR) values between BAT positive and BAT negative individuals.
Conclusion: Our data suggest that individuals with obesity and active BAT are protected against arterial inflammation. Bariatric surgery is associated with an increase in BAT prevalence in previously BAT negative individuals and a decrease in arterial inflammation as compared to baseline.

PO4.375

Weight evolutional and nutritional status in a spanish multicentric cohort of pregnancies after bariatric surgery

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Introduction: Following bariatric surgery (BS), pregnant women are at high risk of nutritional deficiencies due to both anatomical changes and increased metabolic demands. Consensus guidelines advise against pregnancy in the short-term post-surgery, suggesting a delay of at least 12 months after surgery or until stable weight and nutritional status are

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achieved. However, there remains limited evidence concerning maternal micronutrient requirements, specific supplementation guidelines, and adequate gestational weight gain (GWG).
Objective: Evaluate weight evolution and nutritional status of pregnancies following BS.
Methods: Retrospective, observational, multicenter study of women with BS undergoing preconceptional and gestational follow-up by the Endocrinology and Nutrition Departments in 5 Spanish hospitals between 2005-2023.
GWG was categorized according to general recommendations of the Institute of Medicine. Nutritional status was determined preconceptionally and in each trimester of pregnancy.
Results: 207 pregnancies from 161 women were analyzed (pregestational BMI:31.2±6 kg/m2, %weight loss surgery-to-conception:36.8±16, 34.6±4.8years). 54.4% had some degree of obesity at the pre-pregnancy time (23% of them with BMI ≥35kg/m2). Primary surgical techniques: 56% Roux-en-Y-Gastric Bypass and 42% Sleeve Gastrectomy. Surgery-to-conception interval was 48.4±41.7 months. In 12% of the cases, pregnancy occurred within 12 months after BS with no significant (ns) differences according to the surgical procedure.
The median GWG was 8.7± 7.4kg (ns differences between techniques), with satisfactory, insufficient and excessive weight-gain in 30.9%, 35.1% and 34% respectively. The most prevalent deficiencies preconceptionally were Vitamin D (25-OH-Vitamin D <30 ng/dL; 61.2%) and Vitamin B12 (<199 pg/dL; 42.5%). During pregnancy, 2 out of 5 women experienced nutritional deficiencies, with protein (prealbumin <0.200 g/L; 11.5-8.81-16.2%) and iron (ferritin <15 ng/mL 12.6-17.7-22%) being the most common at each trimester, respectively. 49.3% of our sample developed anaemia during pregnancy (Haemoglobin <12 g/dL), with ns differences between techniques. 73.8% were supplemented with a pregnancy-specific-multivitamin. Supplementation with vitamin D, B12, protein and iron were prescribed in 59.0, 80.6, 14.9 and 69.4% of them.
In comparison to those pregnancies occurred 12 months after BS, women whose pregnancies were before this period exhibited a significantly higher BMI (33.7±5.8 vs 30.8±5.8 kg/m2; p=0.02) and less GWG (1.5±11 kg vs 9.7±6.2 kg; p=0.0019). 100% of this subsample experienced nutritional deficiencies at the time of conception and 71% at each gestational trimester.
Conclusions: Our data underscore the critical importance of preconception evaluation and early management in women with gestational desire following BS. Additionally, we advocate for a close multidisciplinary follow-up during the perigestational period to optimize weight and nutritional status.

Conflict of Interest: None Disclosed

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PO4.376

Optimizing body composition and lean mass preservation: The value of AI-powered digital platforms and health coaches for patients on GLP-1 medications

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Introduction: The preservation of lean body mass during weight loss is crucial for maintaining metabolic health and functional capacity. GLP-1 medications have shown efficacy in inducing weight loss, but there is a growing interest in understanding their impact on body composition. AI-powered digital platforms and health coaches offer personalized support, enhancing adherence and potentially optimizing the preservation of lean body mass during weight loss. This abstract explores the value of integrating AI-driven interventions for patients taking GLP-1 medications, with a focus on body composition and lean body mass preservation.
Methods: A retrospective study was performed utilizing quantitative data sourced from the AI-powered digital platform provided by Allurion Technologies (Natick, MA). The analysis encompassed patients with obesity or overweight who had been prescribed GLP-1 medications, specifically tirzepatide, semaglutide, or liraglutide. The AI platform provided personalized meal plans, exercise routines, medication reminders, and real-time feedback based on patient data. An at-home scale with bioelectrical impedance analysis measured weight and body composition parameters, including weight loss (WL), total body weight loss (TBWL), fat mass (FM), visceral fat index (VFI), muscle mass (MM), and lean body mass (LBM). Results are expressed as mean ± standard deviation. Data analyses were conducted using SAS® version 9.4.
Results: The analysis included 138 patients who were treated with GLP-1s and utilized the AI digital platform for four months in 2024. Mean age was 47.8±12.9 years, 73.2% were female, and mean starting BMI was 33.9±4.7kg/m2. After 4 months, average WL was 12.8±5.4kg and TBWL was 13.0±5.0%. Initial FM, VFI, MM, and LBM were 31.9±5.3kg, 15.1±3.2, 59.1±8.1kg, and 62.7±8.4kg, respectively. Participants reduced FM, VFI, MM, and LBM by 13.2%, 12.9%, 7.0%, and 8.1%, respectively (p<0.0001) compared to baseline. By month four, 28.3% of patients with excess VFI achieved a healthy level (≤12).
Conclusion: The results underscore the potential advantages of integrating an AI-powered digital platform and health coach into weight management programs for patients on GLP-1 medications. Enhanced weight loss outcomes and maintenance of body composition were evident, especially comparing these results with the 30-40% lean body mass loss reported after 12 months in previous GLP-1 studies (Wilding et al., 2021; McCrimmon et al., 2020), indicating that AI-driven interventions may significantly complement traditional treatment methods. The AI platform's capability to deliver real-time, personalized support effectively addresses common obstacles to weight loss, including motivation, adherence, and lifestyle adjustments.
In summary, incorporating AI-driven digital platforms and health coaching into weight management programs for patients utilizing GLP-1 medications markedly improves treatment outcomes and preserves lean body mass. Future investigations should examine the long-term impact of these interventions.

PO4.377

Post-Bariatric Efficacy of the Glucagon-Like Peptide-1 Receptor Agonists Liraglutide and Semaglutide for the Treatment of Weight Regain

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Purpose: Weight regain after bariatric surgery occurs in up to a third of patients and reduces treatment-associated health benefits. The efficacy of glucagon-like peptide-1 receptor agonists (GLP1-RA) for treatment of type 2 diabetes mellitus and obesity is well established, but their role in the treatment of weight regain after bariatric surgery remains to be defined.
Materials and Methods: This was a single centre retrospective observational study conducted at our centre. Patients with 6 months of treatment with GLP1-RA, up until March 2023, due to weight regain after bariatric surgery were identified. Data on body weight and relevant clinical parameters were collected before and after 6 months of treatment with GLP1-RA. Data are presented as median (interquartile range).
Results: Seventy patients (78% female) were included. Before GLP1-RA treatment (liraglutide, n=39; semaglutide, n=31), weight and BMI were 98.5 kg (83.4, 107.9) and 36.0 kg/m2 (31.7, 38.7), respectively, with a post-bariatric weight regain of 17.3% (10.6, 22.8) of total body weight and 4.6 kg/m2 (3.3, 6.2). After 6 months of GLP1-RA treatment, a reduction in weight and BMI of 9.8% (5.2, 11.4) of total body weight and 2.9 kg/m2 (1.8, 4.0) was observed (P value <0.0001), corresponding to 64.4% (40.4, 92.2) of the weight regain. No serious adverse events were reported.

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Conclusion: For patients experiencing weight regain after bariatric surgery, two-thirds of the weight regain can be safely lost with GLP1-RA, providing clinicians with a therapeutic option for this clinical challenge, and highlights the need for a large-scale randomized clinical trial.

PO4.378

Outcomes of a Swallowable Intragastric Balloon (Elipse™) on 96 Overweight and Obese Patients

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Background: The traditional gastric balloons have been used for several years to reduce weight in overweight and obese patients, but the need for sedation and upper endoscopy leading to several limitations. The current series is the first study that evaluates the safety and effectiveness of the swallowable gastric (ElipseTM) balloon in our population on the national level.
Methods: Ninety-six patients (mean BMI was 33.6 ± 4.3 kg/m2) participated in this study. All patients swallowed one ElipseTM balloon intended to remain in the stomach for 4 months, self-empty, and then pass. Each balloon was filled with 550 mL of filling fluid. Anti-emetics and anti-spasmodic drugs were prescribed for 2–3 days after insertion; proton pump inhibitor was prescribed twice daily 1 week before the procedure and continued until the end of residence time (16–20 weeks).
Results: In the current series, at end of the procedure (after 4 months), the overall mean weight loss (WL) was 11.2 ± 5.1 kg, mean waist circumference reduction was 10.9 ± 2.1 cm, and a mean BMI reduction was 4.9 ± 2.0 kg/m2. The percentage of total body weight loss (TBWL%) was 12.1 ± 5.2%. The ElipseTM therapy reported improvements in the metabolic parameters investigated.
Conclusion: This swallowable gastric balloon (ElipseTM) can be safely and successfully swallowed, filled, imaged, and passed with accepted weight loss and clinical improvement in factors related to the metabolic syndrome.

PO4.380

Visceral Adipose Tissue and Cardiometabolic Risk: Insights from Body Composition Analysis Using DEXA in Obese Patients

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Introduction: With the global rise in obesity, understanding body fat distribution and its clinical implications is crucial. Visceral adipose tissue (VAT) has gained particular attention due to its association with impaired glucose and lipid metabolism, increased predisposition to certain neoplasms, and other adverse health outcomes. Dual-energy X-ray absorptiometry (DEXA) enables the quantification of body composition, including VAT estimation by area, where values exceeding 160cm2 correlate with a very high cardiometabolic risk. This study aimed to identify body composition factors correlated with VAT.
Methods: An observational study was conducted with patients attending an Endocrinology Obesity clinic who underwent DEXA between 2022 and 2024. Anthropometric data, the presence of metabolic comorbidities and body composition parameters were collected. Statistical analyses were performed using SPSS®.
Results: A total of 101 patients were included, 81.2% female (n=82) and 18.8% male (n=19). The mean age was 44.4±12.31 years (range 18-67) and the mean BMI was 41.09±5.68 kg/m2. Among participants, 10.9% had type 2 diabetes, 25.7% had pre-diabetes, 32.7% had hypertension and 62.4% had dyslipidemia.
The mean VAT was 192.82±72.61cm2, higher in males (204.86±119.97cm2) than females (190.03±57.17cm2), though the difference was not statistically significant (p=0,455). Patients with type 2 diabetes had significantly higher mean VAT (217.20±30,83cm2) compared to patients without diabetes (186.48±67cm2;p=0,014), as did patients with hypertension (218.28±84.02 cm2 vs 176.04±49.08cm2;p=0,010) and dyslipidemia (197.78±63.23 cm2 vs 175.54±66,59cm2; p=0.022).
When adjusted for age and sex, VAT correlated moderately with BMI (r=0.430;p<0.001), with a stronger correlation in males (r=0.777;p<0.001) than in females (r=0,275;p=0.013). VAT showed a weak positive correlation with fat mass percentage (r=0.285;p=0.004), significant only in males (r=0,459;p=0.049 vs r=0.107; p=0,342 in females). A moderate correlation between VAT and lean body mass normalized for height was observed (r=0.446;p<0.001), significant only in males (r=0.688;p=0.005). The strongest correlation was with the android/gynoid fat ratio (r=0.562;p<0.001), more pronounced in males (r=0.813;p<0.001 vs 0.492;p<0.001 in females).
Conclusion: This study demonstrated that a higher VAT is associated with an increased risk of type 2 diabetes, hypertension and dyslipidemia, emphasizing its role in cardiometabolic risk. VAT was moderately correlated with BMI and lean body mass normalized for height, with weaker correlations in females. Interestingly, the correlation between VAT and fat mass percentage was not significant in females, suggesting that a higher fat mass in women is not necessarily associated with increased cardiometabolic risk. The strongest correlation was observed with the android/gynoid fat ratio, a parameter reflecting abdominal obesity, closely linked to visceral fat content. This correlation was significantly stronger in males. Finally, this study highlights the utility of DEXA in assessing body composition and its potential role in stratifying cardiometabolic risk in obese patients.

PO4.381

Client Insights from Bangladeshi Speaking Weight Management Group

Sirin Ayva, A. B.; Buckley, M.; Roast, J.; Edwards, S.; Gately, P.

MoreLife UK

Introduction: Individuals from different cultural backgrounds are at higher risk of developing public health problems1. Obesity is one of them, and weight management services usually have a reduced BMI eligibility criterion for these individuals.
Morelife UK is a nationwide weight management provider in the UK and provides services to people from different backgrounds. Previous studies show that group-based approaches effectively reduce weight, and weight loss is correlated with the number of sessions attended 2,3,4. Morelife inclusion criteria include BMI ≥ 30kg/m² without co-morbidities (adjusted to 27.5kg/m² for Black African, African-Caribbean and Asian ethnic groups). The MoreLife programme offers yearlong support with weekly and monthly sessions to cover nutrition, dietetic, psychological and physical activity contents.
Method: Morelife worked with existing clients with the same background and stakeholders to create a culture-specific programme and curriculum for the Bangladeshi community. We completed three in-depth interviews with the current clients from the Bangladeshi community. We worked collaboratively with a local organisation to create a specific programme to meet their specific needs and facilitate weight management. Based on this initial work, we created an 8-week programme for a women-only small group with an interpreter. The programme's content is created by our clinicians with the help of people with lived experience and local Bangladeshi organisations.
The 8-week group programme has just finished, and we are collating the client outcomes. A focus group is planned with the completers to get more insights regarding their experience with this specific group.
Results: Quantitative and Qualitative data will be analysed appropriately to understand client outcomes and identify their experience with this specific delivery group.

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Conflict of Interest: None

Funding: None

PO4.382

Evaluation of early phase implementation of Best Health: a community-based service for obesity management in the Irish healthcare system

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Introduction: The Best Health programme is a self-management education and support (SMES) programme for people living with obesity. Adults with a BMI ≥ 30kg/m2 and two co-morbidities are accepted. It is delivered by dietitians online or in person over 12 months, including initial 1:1 assessment (IA) and 14 group sessions. The programme takes a health gains approach, recommended by clinical guidelines as a means of reducing internalised weight stigma and supporting appropriate outcome goals that acknowledge that weight is not a behaviour and encourages body acceptance (ASOI, 2022). Participants are supported to gain the knowledge, skills and confidence to self-manage the chronic condition of obesity and improve weight, overall health and mental wellbeing.
Aim: To evaluate the effectiveness of the Best Health programme during early phase implementation in a real-world setting within the Irish healthcare system.
Methods: A service evaluation approach was used to assess engagement, clinical and patient experience outcomes. Data was captured at 3 timepoints, baseline (T1), midway (T2) and end of programme (T3) during programmes commenced and completed between October 2021 up to March 2024. A combination of validated questionnaires (for mental wellbeing (WHO -5) and physical activity (GPPAQ)) and bespoke questions were included in the participant questionnaire. To investigate the difference in quantitative measures across the programme (T1 vs T2 vs T3) the Friedman test was used. Descriptive statistics were used to characterise the data and data are reported as means ± SD or number (N) and percentage (%).
Results: 193 participants, across six sites were eligible for inclusion in the analysis. Programme completion was 62% (120/193), this was defined as having attended 50% of the programme including at least two core sessions (sessions 1-6) and at least one follow up support session. The cohort was predominantly female (71%), aged 54.4 ± 14y. Baseline BMI was 40 ± 7 kg/m2 and 46% (n=88) of the cohort were classified as having obesity III (BMI ≥40 kg/m2). 17% had type two diabetes, 57% had hypertension and 50% hyperlipidaemia. Of the participants that had a recorded weight change at end of programme, 49% (n=39/80) lost ≥ 3% body weight, 30% lost ≥ 5% and 10% lost ≥ 10%. Triglycerides reduced from 1.7 (1) to 1.5 (0.6) mmol/L (p=0.02).The WHO Wellbeing index score improved significantly from 40.4 ± 27.2 to EOP 60 ± 29.4 (p=0.02). A 7-point Likert scale (1 = not at all helpful, 7 = extremely helpful) was used to ask participants to rate helpfulness of the programme to them. Overall, there was a high rating of helpfulness with 79% of responders rating the course as 6 or 7 on the Likert scale.
Conclusion: Implementation of a health gains approach to obesity management in a community setting leads to clinically meaningful weight loss in individuals with higher levels of obesity complexity, while also fostering improvements in mental well-being. This approach aligns with international clinical guidelines, which emphasise the importance of prioritising health and well-being improvements over solely focusing on weight loss as the primary outcome.

PO4.383

Outcomes of Self-Guided Help Binge Eating Pilot

Sirin Ayva, A. B.; Buckley, M.; Roast, J.; Edwards, S.; Gately, P.
MoreLife UK

Introduction: Individuals living with obesity have higher binge eating behaviours compared to others1. Binge eating behaviours prevent individuals from creating regular and healthier eating habits to manage their weight. Behaviour change-informed weight management programmes could be triggering for people with binge eating behaviours.
Morelife is a healthy lifestyle provider across the UK that offers weight management programmes to local residents funded by Integrated Care Boards. Morelife piloted a Binge Eating Intervention that started in September 2021 and continued until late 2023. The aim of this pilot was to provide a binge eating intervention before starting the main weight management intervention to ascertain whether this improves client outcomes on their disordered binge eating.
Method: The Binge Eating intervention is a 12-week, guided self-help programme that is compliant with NICE guidelines. It consists of individuals working through a manual alongside seven telephone support sessions from their trained guide. Once clients complete the Binge Eating Intervention, they then enter More Life's standard one-year weight management intervention. The Binge Eating Scale (BES) was used to screen clients for this pilot.
The (BES) is a 16-item self-report instrument designed to evaluate the presence and behavioural manifestations of binge-eating disorder (BED)2, with scores ranging between 0 to 46. Clients are classified as having no binge eating (score ≤ 17), mild to moderate binge eating (score of 18 – 26) and severe binge eating (score ≥ 27) based on their scores. Those clients who scored 27 or above were offered the binge eating intervention prior to starting our standard weight management intervention. The clients who completed this 12-week Self-Guided Binge Eating pilot repeated the BES to compare their results after completing the programme.
Results: Between September 2022 and December 2023, 44 clients completed the Guided Self-Help program. The average BED score was 34.25 before the programme whereas it reduced to 22.9 at the end of 12-week programme. Following completion of the Guided Self-Help Programme, the clients attended More Life's standard one-year weight management programme. Thirty-eight clients completed the 12-week healthy lifestyle programme with average weight loss of 3.18 kg (2.51% reduction from their initial weight). At the 6-month point, the average weight loss was 8.41 kg (n=28, 6.40% reduction from their initial weight), whereas, at 12 months, the average weight loss was 11.29 kg (n=15, 8.19% reduction from their initial weight).
Conclusion: Self-guided binge Eating programmes are effective in reducing binge eating scores for people living with obesity. The weight loss followed steadily but significantly after the completion of the programme.

Conflict of Interest: None

Funding: None

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PO4.384

Dietary Timing and Metabolic Health: A Randomized Trial in Shift Workers with Overweight or Obesity and Type 2 Diabetes

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Introduction: Night-shift workers with overweight or obesity are at significantly higher risk of developing metabolic disturbances, including prediabetes and type 2 diabetes mellitus (T2DM), as a consequence of circadian misalignment and lifestyle challenges such as irregular eating patterns and reduced physical activity. These metabolic alterations are often exacerbated by poor-quality diets and disrupted meal timing, leading to increased adiposity, insulin resistance, and systemic inflammation. Tailored dietary strategies focusing on macronutrient timing and composition may provide a novel approach to mitigate these risks. This study evaluates the effects of three low-calorie diets, differing in macronutrient distribution and timing, on glucose metabolism, body composition, and overall health outcomes in this vulnerable population.
Methods: This 12-week randomized controlled trial includes 120 individuals with overweight or obesity (BMI > 27.5 kg/m²) and a diagnosis of prediabetes or T2DM, all of whom work shifts, including night shifts. Participants attend three visits (baseline, 6 weeks, and 12 weeks) for comprehensive assessments. Body composition is evaluated using dual-energy X-ray absorptiometry (DXA), and physical activity levels are monitored with accelerometers worn for seven consecutive days at each time point.
Participants are randomly assigned to one of three dietary interventions:
A. High-protein dinner diet, where 60% of total daily protein is consumed at dinner,
B. Low-protein dinner diet, where only 15% of daily protein is consumed at dinner, or
C. Normoproteic diet, with a balanced distribution of protein throughout the day.

The diets are fully personalized and tailored to individual preferences and nutritional requirements, under the guidance of professional dietitians. Primary outcomes include fasting glucose, HbA1c, and changes in body weight, while secondary outcomes focus on shifts in body composition, visceral fat, insulin sensitivity, and physical activity patterns. To date, 46 participants have been randomized, with baseline data available for 25 participants.
Results: Baseline data from the 25 participants (mean age: 54.9 years; 52% female) show an average weight of 91.2 kg (±14.5), body fat percentage of 41.1% (±6.2), and visceral fat of 1.726 kg (1.274 - 2.575). Glycemic measures, including fasting glucose (108 mg/dl; 100.5 - 122.25) and HbA1c (6.0% ± 0.6), highlight the metabolic challenges faced by this group.
Conclusion: This study addresses the unique metabolic needs of shift workers, including those working night shifts, who experience increased risks of obesity, prediabetes, and T2DM. By emphasizing macronutrient timing in dietary interventions, our findings aim to support personalized approaches to improve metabolic health and body composition in these populations.

PO4.386

How Helpful are the Behaviour Change Techniques? Insights from the Weight Management Clients

Sirin Ayva, A. B.; Buckley, M.; Roast, J.; Edwards, S.; Gately, P.
MoreLife UK

Introduction: Obesity is a long-term condition which may increase many other health conditions1. Preventable behaviours, such as physical inactivity and unhealthy eating, have been identified as leading causes of morbidity and mortality2.
Morelife is a healthy lifestyle provider across the UK. Morelife utilises behaviour change techniques to support clients with their weight management journey. Morelife offers year-long support with 12 weekly and nine monthly sessions. Behaviour change techniques, motivational interviewing, and healthy lifestyle information are the core components of each session. NICE3 recommends identifying combinations of behaviour change techniques and modes of delivery to understand the effectiveness of those techniques in different socio-demographic groups with varying levels of motivation.
Method: MoreLife service users are referred by healthcare professionals with a BMI ≥ 35kg/m² without co-morbidities (adjusted to 30 kg/m² for Black African, African-Caribbean, and Asian ethnic groups). The MoreLife programme offers yearlong support with weekly and monthly sessions covering nutrition, dietetics, psychological, and physical activity topics.
This evaluation aims to clarify which behaviour change techniques work, when, and for whom.
We scheduled six focus groups (four with the clients and two with the delivery staff) to gather an in-depth understanding of utilizing behaviour change techniques in weight management programmes. The clinical team will facilitate the focus groups in January 2025. Participants' ethnicity, age, initial motivation, and social demographic factors will be monitored.
Results: Qualitative data will be transferred to the computer and analysed using content analysis. Identified themes and concepts will be discussed in light of the relevant literature.

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Conflict of Interest: None

Funding: None

PO4.387

Service Evaluation of Maternity Healthy Lifestyle

Rogerson, L.; Sirin Ayva, A. B.; Mcmahon, O.; Roast, J.; Edwards, S.; Gately, P.
MoreLife UK

Introduction: This service provides specialist weight management and dietetic support to pregnant individuals with a BMI > 30kg/m² residing in Salford and Manchester. The service aims to help participants achieve appropriate weight gain during pregnancy, in line with British Dietetic Association (BDA) guidelines, and to support weight loss in the postnatal period. Participants received tailored healthy lifestyle advice across six sessions during the antenatal and postnatal journey, supplemented by optional weekly postnatal drop-in sessions.
Method: Antenatal and postnatal weights were either self-reported by clients or taken during face-to-face sessions as part of the three antenatal appointments offered by the service. Based on BDA guidelines, recommended weight gain for individuals with a BMI > 30kg/m² was defined as 5–9kg during pregnancy. Postnatal weights were collected during face-to-face sessions or through self-reporting. Qualitative data were gathered via a client feedback survey to evaluate participants' experiences and the impact of the programme on their physical and mental health.
Results: Of the 275 referrals received since March 2023, 63 clients completed antenatal weight tracking, and 37 provided postnatal weight tracking. Among antenatal participants, 50 (79%) maintained weight gain within the 5–9kg BDA-recommended range. Eight clients lost weight during pregnancy, with weight changes attributed to healthy lifestyle modifications. The average weight change during pregnancy was +5.6kg, ranging from -7kg to +24kg. Postnatally, 21 out of 37 clients (57%) achieved a

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weight below their referral weight, and 32 clients (86%) lost weight from their final recorded pregnancy weight.
Qualitative feedback highlighted the programme's positive impact on participants' experiences. One participant shared, "I have enjoyed every session, and the way everything gets explained really helps with not only me but my family as well, for example my husband and stepdaughter." Another noted, "The session was good—really informative and well-paced. It was beneficial to set goals to reflect on in the future." Participants frequently praised the service's non-judgmental approach and the opportunity to learn sustainable strategies for weight management, which also positively influenced their mental health.
Conclusion: The service achieved strong outcomes in promoting healthy weight gain during pregnancy and weight loss postnatally. While 79% of antenatal participants met recommended weight gain targets, postnatal results demonstrated sustained benefits, with 86% losing weight from their final pregnancy weight. Qualitative feedback underscored the programme's value in improving participants' physical and mental well-being.

Funding: This project was funded by The Innovation Fund grant.

Conflict of Interest: None.

PO4.388

A Comprehensive Approach to Weight Loss in Patients with Obesity: Metabolic Changes and Improvement in Liver Markers

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Introduction: Given the high impact of obesity and its comorbidities, such as non-alcoholic fatty liver disease (NAFLD), various strategies have been proposed to achieve effective and sustainable long-term weight loss. Some of these strategies focus on basal metabolic changes induced by dietary interventions that stimulate the production and utilization of ketone bodies as an energy source. Weight loss strategies have shown significant improvements in NAFLD markers. The aim of the current study was to evaluate the weight loss program effects in changes at REE and NAFLD stages.
Methods: This is an interin analysis conducted on the first 71 patients with obesity of the randomized crossover clinical trial (NCT05420311). Participants underwent three dietary interventions of 30 days: a balanced macronutrient diet, a ketogenic diet, and alternate-day fasting (90 days of total monitoring). Body composition changes were registered using bioimpedance (TANITA RD-545) and plethysmography (BODPOD, Cosmed), while resting energy expenditure (REE) was evaluated using the QUARK metabolic cart (Cosmed). NAFLD staging was assessed via liver elastography (FibroScan). Additionally, participants were encouraged to engage in at least 250 minutes of moderate physical activity per week.
Results: Patients with obesity achieved an average weight loss of 7.9 ± 13.5 kg ($P<0.001$) as well as significant reductions in fat mass ($P<0.001$), waist circumference ($P<0.01$), systolic and diastolic blood pressure ($P<0.001$). Improvements were also observed in glucose levels ($P<0.01$), insulin ($P<0.01$), and lipid profiles ($P<0.05$), along with a significant reduction in liver fat levels ($P<0.001$).
About REE, the first diet had a more pronounced metabolic impact, regardless of the diet implemented. Moreover, the influence of the diet's sequences was also analyzed, but no specific one led to a greater fat loss or REE changes.
Conclusion: This program of weight loss improved several parameters including liver fat levels, reducing the NAFLD stages. Nevertheless, no particular sequence was associated with higher weight loss even though the first diet was able to induce the major changes at metabolic levels (REE).

PO4.389

Enhanced weight loss outcomes with GLP-1/GIP RA therapy through patient engagement with a digital health platform: a retrospective service evaluation

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Introduction: Novel pharmacotherapies have the potential to radically change the epidemiology of obesity and alter its complication burden at a population level. Randomised trial evidence shows that GLP-1 receptor agonists (e.g. semaglutide) and dual GLP-1/GIP receptor agonists (e.g. tirzepatide) drive significant weight loss. Digital weight loss services could augment pharmacotherapy by providing wrap-around support including behavioural and nutritional coaching.
Methods: Retrospective service evaluation of adult individuals aged 18-75 years with a BMI ≥ 27kg/m2 enrolled into the Voy digital weight loss service including treatment with semaglutide or tirzepatide between Feb 2023 to Dec 2024. The service included access to an app platform that offers progress tracking and delivery of nutritional and behavioural coaching which individuals choose to engage with. Participants were categorised into 'engaged' and 'non-engaged' groups based on meeting any of the following: attending at least 1 coaching session, tracked weight in the App at least weekly and used the App at least once. Mean percentage weight loss was compared between engagement groups using t-tests at 6, 9 and 12 months.
Results: The number of participants reaching 6, 9 and 12 months follow-up on semaglutide were 4209, 2479 and 1468, respectively. For those prescribed tirzepatide, 3298 reached 6 months, 208 reached 9 months follow-up (0 reached 12 months due to later roll-out). Mean weight change was consistently significantly higher in engaged groups compared to non-engaged groups at all time points. For individuals prescribed semaglutide, these were: 11.6% (95% CI: 11.3% to 11.8%) vs. 8.2% (95% CI: 7.6% to 8.7%) at 6 months; 12.8% (95% CI: 12.5% to 13.2%) vs. 8.0% (95% CI: 7.4% to 8.7%) at 9 months; and 12.2% (95% CI: 11.6% to 12.7%) vs. 8.1% (95% CI: 7.2% to 9.0%) at 12 months (all $p<0.001$). For individuals prescribed tirzepatide, mean weight loss in engaged and non-engaged groups was: 17.5% (95% CI: 17.2% to 17.7%) vs. 12.7% (95% CI: 12.2% to 13.3%) at 6 months; and 20.9% (95% CI: 19.5% to 22.3%) vs. 12.3% (95% CI: 9.8% to 14.8%) at 9 months (both $p<0.001$). The relative difference in weight loss between engaged and non-engaged groups at 9 months follow-up was 60.0% for semaglutide and 69.9% for tirzepatide. Engagement with the App was associated with significantly higher attainment of 15% total body weight loss at 12 months in the semaglutide group (34.9% vs. 20.0%, $p<0.001$), and also with 15% total body weight loss by 9 months in the tirzepatide group (77.6% vs. 37.7%, $p<0.001$).
Conclusion: Engagement with the Voy digital weight loss platform was associated with attaining 60% or higher weight loss than with medication alone. In the context of increasing access to GLP-1/GIP RAs such as the forthcoming national roll-out of tirzepatide in the UK, digital tools may present powerful tools to amplify weight loss outcomes in the long term. 12-month follow-up data will mature for tirzepatide in early 2025.

Conflict of Interest: HJ, DH & AKC are employees of Menwell Ltd, the provider of the Voy weight loss service.

Funding: No specific funding to report.

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PO4.390

Gut Microbiota and Metabolic Health in Women with Obesity

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Introduction: Obesity, along with its related metabolic disorders such as type 2 diabetes, represents a significant global health challenge. The gut microbiome has emerged as a critical factor influencing obesity and metabolic health. Recent research has shown that weight loss interventions can modulate the gut microbiota and improve metabolic biomarkers. Therefore, we investigated the comparison of the gut microbiome between women with extreme obesity and normal weight and the effects of a structured weight loss program on the gut microbiota and metabolic health in women with obesity.
Methods: We conducted a cross-sectional analysis followed by a control trial involving women with extreme obesity/obesity. The cross-sectional analysis compared women with extreme obesity to healthy controls. The control trial consisted of an intervention group that participated in a 12-week program combining caloric restriction with strength training and high-intensity interval training. Microbial composition was analyzed using 16S rRNA gene sequencing of fecal samples.
Results: In the cross-sectional analysis, women with extreme obesity exhibited significantly lower microbial α-diversity, a lower relative abundance of beneficial bacteria (e.g., Akkermansia), and a higher relative abundance of pathogenic bacteria (e.g., Bilophila). The intervention resulted in significant improvements in body composition, along with positive changes in metabolic health markers (e.g., liver enzymes). Significant increases in the relative abundance of beneficial bacteria (e.g., Akkermansia muciniphila) were observed, alongside a decrease in the relative abundance of pathogenic bacteria (e.g., Erysipelatoclostridium ramosum).
Conclusion: Our findings highlight the critical role of the gut microbiome in obesity and metabolic health. Lifestyle interventions combining diet and exercise can positively influence gut microbiota and metabolic biomarkers. In individuals with extreme obesity, alterations in the gut microbiota could serve as early indicators of metabolic disturbances, offering new avenues for preventive and therapeutic strategies. Modulating the gut microbiota through non-invasive interventions presents a promising approach for managing obesity and its comorbidities.

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PO4.391

Outcomes of 'My Life Plan' An Inclusive Digital Weight Loss Programme by Morelife

Sirin Ayva, A. B.; Edwards, S.; Simpson, V.; Roast, J.; Gately, P.

MoreLife UK

Introduction: Individuals living in deprived areas may experience some barriers to accessing weight management services (NICE Health Inequalities Briefing, 2023). Common barriers include language barriers, shift work, childcare, and lifestyle. Research shows that digital interventions help support weight loss in adults living with obesity and overweight (Berry, Kassavou & Sutton, 2021).
MyLifePlan (MLP) was created by Morelife, an interactive digital platform consisting of 12 weekly sessions with educational videos, recipes, podcasts and other nutrition, physical activity and psychology resources. The platform is accessible through mobile phones and computers. It has Auto-translation to 98 languages and ReachDeck assistive technologies: text-to-speech, translations, Picture Dictionary, Screen Mask (reduces visual stress/improves focus), text magnifier, webpage simplifier (removes potentially distracting content),and multiple formats including Easy Read. Recipes on this platform reflect a variety of cultures, religions, beliefs and financial pressures. The platform has progress and interactive goals/exercise trackers, motivational and personalised nudges and interactive challenges. This digital platform has been offered to Morelife clients as an option for weight management purposes.
Method: This service evaluation aims to analyse the outcomes of the MLP platform. In total, 262 (155 female, 107 male) clients completed the digital programme by engaging with the content for 12 weekly sessions and uploading their self-measured weight between weeks 8 and 12. 215 (82%) had hypertension, 49 (19%) Type 1 diabetes and 61 (23%) Type 3 2 diabetes.
Results: Outcomes show that 189 (72 %) clients lost more than 3% of their initial body weight, and 126 (48%) clients lost more than 5% of their initial body weight. 49% of those with hypertension, Type 1 and Type 2 diabetes, 49%, 29% and 46% achieved over 5% weight loss respectively.
Conclusion: These outcomes show that the MLP digital programme helps clients with hypertension and diabetes lose weight in 12 weeks. Future research is needed to evaluate the long-term effectiveness of this platform for weight loss maintenance and to identify characteristics of those most likely to have success using a digital platform for weight management.

Conflict of Interest: None

Funding: None

PO4.392

Preliminary Findings of a Community Tier 2 Weight Management Service for Clients with Severe Mental Illnesses: Client Insights

Sirin Ayva, A. B.; Costelloe, E.; Buckley, M.; Edwards, S.; Roast, J.; Gately, P.

MoreLife UK

Introduction: Severe mental illness and obesity are each serious public health problems. Some of the effective medications for severe mental illnesses are associated with weight gain1. When using drugs with weight inducing effects, behavioural weight management services are recommended to manage weight. Previous studies show that group-based approaches are effective on reducing weight and the weight loss is correlated with number of sessions attended 2,3,4.
MoreLife is a nationwide weight management provider in the UK. Service users are either referred by healthcare professionals or using self-referral path and inclusion criteria include BMI ≥ 30kg/m² without co-morbidities (adjusted to 27.5kg/m² for Black African, African-Caribbean and Asian ethnic groups), BMI ≥ 25kg/m² with one or more co-morbidities (adjusted to 23kg/m² for Black African, African-Caribbean and Asian ethnic groups). The MoreLife programme offers a yearlong sup-port with weekly and monthly sessions to cover nutrition, dietetic, psychological and physical activity contents.
Method: MoreLife works collaboratively with a local mental health service to provide bespoke services to clients with severe mental illnesses in the area. Upon consultation with the local mental health professionals, who are heavily involved with the target population regarding their mental health, adjustments on the main curriculum and programme are agreed to address needs of this population. The targeted client population is individuals with a diagnosis of personality disorder and schizophrenia. The programme will be nine weekly sessions followed by monthly sessions delivered by the same practitioner. The sessions will take place in the community area which all the clients are familiar with. Their weight and wellbeing will be monitored before and after the programme. Qualitative data will be collected alongside a couple of 2 extensive case examples from this cohort. The sessions will start April 2024 and the data collection will end June 2024.
Results: Qualitative data will be transferred on the computer to be analysed with content analysis. Case examples will give deeper insights from the client experience with SMI in a group weight management programme.

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Conflict of Interest: None

Funding: None

PO4.393

Easo Position Statement: Complications And Management Of Women With Obesity During Their Reproductive Cycle

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Introduction: Obesity is a chronic relapsing, neurobehavioral disease resulting in excess adipose tissue deposition and dysfunction. Women are disproportionately affected with obesity (18.5% in women vs 14% in men). Besides metabolic, mechanical and psychological disorders, there are complications unique to women with obesity. Additionally, the newborns of women with obesity may be predisposed to obesity and metabolic disorders later in life.
This EASO position statement aims to help in the assessment of women living with obesity, and highlight the evidence available across their reproductive cycle (Fertility, Preconception, Pregnancy and Postpartum)
Methods: We conducted a comprehensive review of available evidence on obesity complications and management in women during their reproductive cycle.The most relevant points were summarized.
Results: Women of childbearing age, who are living with obesity, have an increased risk of diabetes, hypertension, and cardiovascular disease as well as mechanical disorders such as sleep apnoea. Moreover, polycystic ovarian syndrome (PCOS), anovulation and infertility. Treatment of obesity prior to conception reduces the risks of gestational diabetes, pregnancy induced hypertension, and adverse fetal outcomes. Pre-conception targeted obesity management options including lifestyle interventions, medications (in particular glucagon like peptide-1 agonists), and metabolic bariatric surgery improve fertility and reduce subsequent risk.
During pregnancy women with obesity are at risk of gestational diabetes and pre-eclampsia, also are more likely to experience fetal complications and postpartum weight gain. Obstetric physicians should aim to manage weight gain in pregnancy with appropriate lifestyle interventions to reduce these risks.
Metabolic diseases can persist or have long-term health implications in woman with obesity during postpartum. Also screening for mental health disorders, such as depression and anxiety, is recommended. Children born to mothers with obesity have a higher risk of developing diabetes or obesity during their lifetime, probably through epigenetic regulation.
Conclusion: Obesity is a chronic disease with multiple associated complications that affect women during their reproductive cycle and their offspring. Management of obesity in this population needs formal recommendations on lifestyle intervention, exercise,diet and treatment with medications or surgery.

PO4.394

Patient treatment choices in a publicly funded Specialist Weight Management Service with equal access to medical GLP-1 agonist and metabolic/bariatric surgery

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Introduction: Clinicians, healthcare commissioners and policy makers may make assumptions regarding the patients' treatment preferences in the modern era where both metabolic/bariatric surgery and medical treatment with GLP-1 agonists can provide clinically significant health improvements for patients living with obesity disease. In addition, patient treatment choices may be influenced by restrictions in access, funding, insurance or public funding criteria in different healthcare systems. Our specialist weight management service is a novel, innovative UK based NHS publicly funded service utilising both face to face and digital contact methods for assessment, patient education, support and treatment. We provide a holistic patient assessment for medical (GLP-1 agonist) and surgical (bariatric/metabolic surgery) treatments. These treatment choices are offered with clinical equipoise providing suitable dietetic and psychological reports. Our service is publicly funded and free at the point of use. We report our early experience regarding patient treatment preferences where patient choice is not restricted by differential access criteria, funding or other confounders.
Methods: 246 patients in an initial cohort of patients in our service were analysed. Two sub-groups were defined. Group A represented 116 patients transferred to our service who had received prior assessment for GLP-1 medication but not yet commenced treatment. Group B consisted of 130 patients who had not received any previous assessment. Group A were given an expedited choice for treatment due to time spent waiting in their previous service. This informed choice was based on written and video information regarding the pros and cons of medical or surgical treatment. Group A patients could then choose to start medical treatment or undergo assessment for surgical treatment. Group B were given a full dietetic, psychological and clinical assessment in our service and offered medical and surgical treatment with clinical equipoise. All patients were given extensive information regarding the risks and benefits of medical and surgical treatments in order that they could make an informed choice.
Results: In Group A, 47/116 (40.5%) chose medical treatment with GLP-1 agonists (Wegovy) and 69/116 (59.5%) chose metabolic/bariatric surgery. In Group B, 56/130 (43.1%) chose medical treatment with GLP-1 agonists (Wegovy) and 74/130 (56.9%) chose metabolic/bariatric surgery.
Conclusions: Despite the increased efficacy of medical treatments for patients living with obesity disease, metabolic/bariatric surgery remains the leading treatment chosen by patients after an informed risk and benefits discussion. This aligns with international guidance that recognises metabolic/bariatric surgery as the gold standard best treatment for obesity disease. Policy makers, service commissioners and clinicians should be mindful of this when designing new models of care and expanding services for patients living with obesity disease.

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PO4.395

Late-evening dietary intake and food choices among individuals with overweight/obesity and type 2 diabetes: Potential for time-restricted eating to support weight loss and improved glycaemic control

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Introduction: Time-restricted eating (TRE) is a type of intermittent fasting reducing the daily timeslot for energy intake without other dietary restrictions. The ongoing RESET2 trial is a single-centre, randomised, controlled, parallel-group, open-label trial including 160 individuals with overweight/obesity and type 2 diabetes. Participants are assigned to either 1-year of standard care plus TRE, or standard care and habitual living. Participants in the TRE group are instructed to follow an eating window of 8-10 hours per day, depending on their habitual eating window (minimum 3-hour reduction), placed between 6 am and 8 pm. The TRE intervention includes a 3-month strict TRE period followed by a 9-month individually adjusted TRE period.

The aim of the present study is to assess the frequency of episodes of energy intake, the prevalence of late-evening dietary intake (defined as energy intake after 8 pm) and types of foods consumed after 8 pm prior to intervention among participants enrolled in the RESET2 trial. This information aims to clarify the potential for improved glycaemic control and weight loss through TRE.

Methods: This preliminary analysis includes baseline data on self-reported dietary intake collected from 4-day dietary food records (3 weekdays and 1 weekend day) from the first 34 participants enrolled in the trial. Data were analysed to estimate the number of episodes of energy intake per day, late-evening energy intake, and types of foods consumed (categorized into 10 groups). The habitual eating window was calculated as an average based on 10 days of registration at baseline.

Later, we will assess whether the TRE group have reduced their total energy intake or shifted their energy intake, and frequency within the new eating window.

Results: Baseline characteristics of the included participants are shown in Table 1. The mean habitual eating window was 13.0 (SD: 2.0) hours, and the mean daily number of episodes of energy intake was 4.5 (SD: 1.2). At baseline, 32 out of 34 participants reported having late-evening dietary intake after 8 pm. Among them, 12 had a late-evening intake on all four days, eight on three days, and six on two days, and six on only one day out of four recorded days. Distribution of food categories among late-evening consumers is presented in Table 2. One third of the study population consumed candy, ice cream, cake and/or chocolate after 8 pm, followed by bread with or without cold cuts and cheese (18%) and fruit and vegetables (15%). Alcohol was consumed by 7% of the participants after 8 pm.

Conclusion: At baseline, a total of 32 of 34 participants had a late-evening dietary intake with 40% of the food intake being high-energy foods such as candy, cake, ice cream, and chocolate, or alcohol. Therefore, there is a great potential for reducing the total energy intake, by closing the eating window at 8 pm. Changes in late-evening food intake and frequency of food intake in response to TRE will be assessed later when participants have completed 3 months of intervention, and these results will be presented at the conference.

Tab. 1.

Number of participants (female/male)	34 (8/26)
Age	65 (9.4) years
Weight	100.6 (16.1) kg
BMI	32.6 (4.6) kg/m2
Diabetes duration	16 (8) years
Data are reported as mean (SD)	

Baseline characteristics:

Tab. 2.

Candy/ice cream/cake/chocolate	33%
Bread with or without cold cuts and cheese	18%
Fruit and vegetables	15%
Late dinner	9%
Small dish/leftovers from dinner	7%
Alcohol	7%
Dairy products	6%
Chips or salted nuts	2%
Coffee with milk	2%
Sweet drinks	1%

Distribution of food categories consumed later than 8 pm as percentage of total episodes:

PO4.396

Cornerstone - a foundation for better treatment of binge eating disorder in Norway

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Introduction: While not all individuals living with obesity have binge eating disorder (BED), research estimates that up to 40 percent of individuals with BED meet the criteria for obesity. This coexistence necessitates close collaboration between the fields of obesity research and eating disorder research. Approximately three percent of the Norwegian population is estimated to have BED, making it more prevalent than bulimia and anorexia combined. ROS – Norwegian Resource Center for Eating Disorders, a user-driven organization, provides guidance and support services. In 2023, ROS responded to nearly 17,000 inquiries from adults and children, with over 30% related to self-reported binge eating issues. Despite the prevalence of BED, treatment options within the Norwegian healthcare system remain significantly underdeveloped. Since 2017, ROS has implemented and evaluated several guided self-help programs for individuals struggling with binge eating, establishing unique expertise in the Norwegian context. Through the project "Cornerstone – A Foundation for Better Treatment of Binge Eating Disorder in Norway," ROS seeks to enhance knowledge of BED and improve screening and treatment options for this vulnerable patient group.

Methods: The project encompasses multiple initiatives, including: Evaluation of guided self-help programs provided by ROS.Conducting a systematic review article on the treatment of BED in youth. Establishing a competence center within ROS to engage national and international experts in the field.

Conclusion: This work aims to address a critical knowledge gap in the Norwegian healthcare system by increasing awareness and recognition of

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BED as a serious mental health condition. The overarching goal is to establish a competence center for BED that offers guidance on screening, diagnosis, and treatment approaches for both the public and healthcare professionals.

Conflict of Interest: None disclosed.

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PO4.397

Weight Loss at 18 Months of Setmelanotide in 2-<6-Year-Old Patients with Rare MC4R Pathway Diseases

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Background: Rare variants in melanocortin-4 receptor (MC4R) pathway genes may impair MC4R signalling, leading to hyperphagia and early-onset, severe obesity. In a Phase 3, open-label trial, the MC4R agonist setmelanotide reduced hunger and weight in patients aged 2 to <6 years with proopiomelanocortin (POMC) deficiency, leptin receptor (LEPR) deficiency, or Bardet-Biedl syndrome (BBS) at 1 year (primary time point). Here, we report sustained improvements in weight outcomes at 18 months of setmelanotide.
Methods: The VENTURE trial (NCT04966741) evaluated 52 weeks of setmelanotide treatment in patients aged 2 to <6 years with hyperphagia and obesity due to biallelic *POMC* or *LEPR* variants or genetically confirmed BBS. This analysis assessed body mass index (BMI), BMI Z score, and percent of the BMI 95th percentile (%BMI95) from baseline to Month 18 of a long-term extension study.
Results: Eight patients (POMC/LEPR, n=5; BBS, n=3) completed 18 months of setmelanotide. All patients had severe obesity at baseline (BMI Z score range, 2.4 to 7.3) and had clinically meaningful reductions in weight at Month 18. The mean percent change from baseline in BMI was −21.5% at Month 12, −22.3% at Month 15, and −23.3% at Month 18. The mean change from baseline in BMI Z score was −1.9 at Month 12, −2.0 at Month 15, and −2.1 at Month 18. The mean change from baseline in %BMI95 in percentage points was −37.0 at Month 12, −38.5 at Month 15, and −41.3 at Month 18. Skin hyperpigmentation (87.5%; all treatment related) and nasopharyngitis (62.5%; all not treatment related) were the most common reported adverse events.
Conclusion: In the first trial of setmelanotide in patients <6 years of age, robust reductions in age-appropriate weight measures were seen in all patients at 18 months of treatment, with no new safety concerns. No approved therapies for patients <6 years old with obesity in the studied populations currently exist, despite the need for early intervention with targeted therapy in these patients.

PO4.398

Determinants of Eating Behavior in Patients with Type 2 Diabetes: Implications for Obesity Management

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Introduction: Eating behavior plays a pivotal role in the etiology and management of obesity, especially in individuals with Type 2 Diabetes (T2D). Understanding the complex interplay between biological, psychological, and environmental factors influencing eating behavior is critical for designing effective obesity interventions in this population. This study aimed to explore the determinants of eating behavior among patients with T2D, with a particular focus on the validation and application of the Dutch Eating Behavior Questionnaire (DEBQ) and its correlations with dietary intake, physical activity, and psychosocial factors.
Methods: A cohort of T2D patients was assessed using validated tools, including the DEBQ and Diet Quality Index-International (DQI-I). Key variables analyzed included emotional eating, external eating, and restrictive eating behaviors. Dietary intake was measured using food frequency questionnaires, while physical activity levels were evaluated with the International Physical Activity Questionnaire (IPAQ-L). Statistical analyses investigated associations between eating behaviors and demographic, anthropometric, and psychosocial factors.
Results: Emotional eating was significantly correlated with higher intake of energy-dense, nutrient-poor foods, while restrictive eating behaviors were associated with better adherence to dietary guidelines. External eating was influenced by environmental cues and social factors. Patients with lower diet quality scores exhibited a higher prevalence of maladaptive eating behaviors, underscoring the importance of integrating dietary and behavioral interventions. Additionally, physical activity levels moderated the impact of eating behaviors on weight outcomes.
Conclusion: The findings highlight the multifaceted determinants of eating behavior in T2D patients and their critical role in obesity management. Targeted interventions that address emotional and external eating, promote dietary quality, and incorporate physical activity hold promise for improving weight management and glycemic control in this population. This research underscores the need for personalized, multidisciplinary approaches to obesity treatment in T2D, integrating behavioral insights with nutritional and physical activity interventions.

PO4.399

Gut microbiota-specific profile for the prediction of type 2 diabetes remission in patients undergoing sleeve gastrectomy

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Objective: The predictive role of baseline gut microbiota in type 2 diabetes (T2D) remission after bariatric surgery remains unexplored. This study aimed to identify specific gut microbiota profiles prior to surgery associated with T2D remission following sleeve gastrectomy.
Methods: This was an observational retrospective study including participants with a body mass index (BMI) ≥ 40 kg/m2 and T2D who underwent sleeve gastrectomy, and had preoperative stool samples available. Gut microbiota was analayzed by 16S rRNA sequencing. Participants were

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classified into remission and non-remission groups based on T2D status one year after sleeve gastrectomy.
Results: A total of forty-six participants were included. After adjusting for baseline confounders (i.e., age, HbA1c levels, T2D duration, and insulin treatment), preoperative gut microbiota diversity showed no statistically significant differences between groups, except for Pielou's evenness index, which was significantly higher in the non-remission group (p=0.01). ANCOM-BC2 analysis identified an enrichment in *Fusicatenibacter*, *Holdemanella* and *Senegalimassilia* in the non-remission group, whereas *Eggerthella*, *Flavonifractor* and *R. gnavus group* were enriched in the remission group. Furthermore, random forest classification highlighted *Eggerthella* and *Flavonifractor* as key genera predicting T2D remission. Functional analysis using PICRUSt2 revealed increased carbohydrate metabolism pathways in the remission group.
Conclusion: Baseline gut microbiota composition may serve as an independent predictor of short-term T2D remission in patients with T2D undergoing sleeve gastrectomy.

Conflict of Interest: None Disclosed.

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PO4.400

Body Composition Improvements with 12 Months of Setmelanotide in Acquired Hypothalamic Obesity

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Background: Hypothalamic obesity (HO) is an acquired form of severe obesity characterized by rapid and excessive weight gain resulting from insult to the hypothalamus that impairs melanocortin-4 receptor (MC4R) pathway signalling. Treatment with setmelanotide, an MC4R agonist, resulted in weight reduction at 12 months in the long-term extension (LTE) of a Phase 2 trial of patients with HO. Here, we detail body composition changes in these patients.
Methods: Data are from a Phase 2 study (NCT04725240) of patients ages ≥6 to ≤40 years with acquired HO who enrolled in the LTE trial (NCT03651765). Treatment adherence was assessed via patient diaries. Mean body composition changes from baseline to Week 16 and ≥1 year (mean time: 477 days) were assessed via dual-energy x-ray absorptiometry.
Results: Of 14 patients who entered the LTE, 11 (79%; 10 paediatric, 1 adult) achieved mean (standard deviation) change in body mass index (BMI) Z score of −1.2 (0.9) and percent change in BMI of −27.1% from index baseline at ≥1 year. These overall reductions in body mass comprised a greater proportion of fat mass loss (−29.6% [17.6]) than lean muscle mass loss (−7.7% [16.9]). Three patients were not included in this analysis because of discontinuation (1 adult), treatment interruption of 6 months (1 paediatric), or documented nonadherence (1 paediatric). These patients did not achieve significant weight reductions and exhibited increased fat mass at Month 12. Patients aged 11-14 years (n=4) at index baseline all experienced an increase in percent lean muscle mass over 1 year, 2 of whom had the least percent change in BMI. No new safety signals were identified.
Conclusions: In a heterogeneous population of patients with HO, 12 months of setmelanotide treatment resulted in greater loss of fat mass than lean muscle mass. These results support the beneficial body composition changes associated with previously reported weight reductions.

PO4.401

Understanding the Rhythm Within: How Anti-Obesity Treatments Alter Heart Rate Variability

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Introduction: Heart rate variability (HRV) reflects fluctuations in the timing between heartbeats, offering insights into the autonomic nervous system's (ANS) activity and balance. Research suggests HRV is a valuable health indicator, with lower variability linked to an increased risk of mortality and the early onset of various health conditions. Studies further reveal an inverse relationship between HRV and weight gain or obesity.
Methods: A PubMed database search was conducted using the strategy: (("Anti-Obesity Agents" OR "Bariatric Surgery") AND "Heart Rate"), yielding 319 articles. A filter was applied to include studies published in the last 20 years, reducing the count to 185 articles. After screening titles and abstracts for eligibility, 22 articles were considered relevant, with one excluded due to inaccessible full text.
Results: Three RCTs assessed the effects of GLP-1 agonists on HRV using 5-minute ECG recordings. Exenatide (acute, 1 week) increased the LF/HF ratio (median: 0.6, [-0.3 to -3.2]; $p < 0.05$), while liraglutide (12 weeks) showed no significant impact on HRV ($p > 0.05$). Fifteen studies examined the impact of bariatric surgery (6 to 12 months post-operation) and consistently identified positive effects on HRV ($p < 0.05$). Two studies found additional HRV improvements in patients who engaged in aerobic exercise following surgery. Findings for sibutramine were mixed. One observational study reported increased HRV with weight loss, while another found no change despite weight loss. A separate case-control study using 24-hour Holter monitoring showed no HRV improvement.
Conclusion: Most studies evaluate HRV over short periods, limiting the understanding of long-term effects, as treatments may yield fluctuating impacts. Further research is needed, and wearable devices could offer a promising approach for continuous HRV monitoring, providing deeper insights into the relationship between anti-obesity treatments and autonomic function.

PO4.402

Association between Lean Body Mass and Bone Mineral Density after Bariatric Surgery

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Introduction: Bariatric surgery (BS) in persons living with obesity has become increasingly popular. Although BS is associated with multiple health benefits, decreased bone mass is a known complication of the procedure. Studies have explored the correlation between body composition and bone mineral density (BMD) after BS. Nevertheless, there has yet to be a consensus because the effects on bone are contradictory but are generally associated with bone loss, increased calcium requirements, decreased adsorption of calcium and vitamin D, and increased fracture risk. In previous studies, we analyzed factors associated with the outcomes of BS, including polymorphisms, eating behavior, hedonic hunger, and depressive symptoms. The present study aimed to measure body composition via dual-energy X-ray absorptiometry (DXA) in persons who underwent bariatric surgery, and to analyze the association between lean body mass and bone mineral density.
Methods: We conducted a cross-sectional study using data from sixty-five adults who underwent bariatric surgery in a public hospital in Mexico. Lean mass, adiposity, and bone mineral density were measured via DXA.

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Pearson correlation was used to explore the associations between Lean Mass/Height², Appendicular Lean Mass/Height², and the whole-body BMD, Lumbar Spine BMD, Hip BMD, and Neck BMD.
Results: The average age of the participants was 48 years (26–66), and they were predominantly women (n = 54). The median total weight loss was 34.7 kg (22.9–48.9), with a BMI of 35.4 kg/m² (18.3–65.3) at 6 years (4–8) after BS. Most participants had a BMD within the normal range, with eighteen meeting the criteria for either low bone density or osteoporosis. The results revealed a weak positive correlation between Lean Mass/Height² and Hip BMD (r = 0.265, P < 0.05; 95% CI = 0.009–0.488), whereas whole-body BMD, Lumbar Spine BMD, and Neck BMD did not correlate with lean mass.
Conclusion: We found that BMD of the hip is associated with lean mass, suggesting that maintaining a proper lean body mass is beneficial for bone mineral density. Bariatric surgery is increasingly acknowledged to adversely affect skeletal health. To counter the negative impacts on bone after a bariatric procedure, sufficient calcium, vitamin D and protein intake, and adequate physical activity are needed. Because obesity is a relapsing chronic disease, long-term obesity treatment should also include the prevention of bone fractures.

PO4.403

Tirzepatide and pioglidazone: a dual therapy for MASLD in patients with obesity and type 2 diabetes

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Background and Aims: Metabolic dysfunction-associated steatotic liver disease (MASLD) is a widespread global and progressive disease with a set of metabolic risk factors and presence of hepatic steatosisis, visceral obesity, insulin resistance and type 2 diabetes (T2D). MASLD is present in up to 80% of people living with T2D. Pioglidazone, a peroxisome proliferator-activated receptor agonist has proven to reduce hepatic/visceral fat (HVF) and improve liver necroinflammation. Tirzepatide, a weekly dual GIP/GLP-1 receptor agonist, significantly reduces liver fatty content (LFC) and improves GGT levels in MASLD.
Aim of this study was to evaluate dual treatment (pioglidazone plus tirzepatide) vs pioglidazone alone in recruited patient with MASLD/T2D.
Method: Diagnosis of MASLD was assessed using ultrasound-fatty liver index that allows to grade steatosis severity (US-FLI score ≥3) and liver fibrosis (F1-F2 staged according to the METAVIR score). Eligible patients (pioglidazone, 45 mg/die, os undergoing treatment for at least 12 mos) added 2,5 – 5 mg subcutaneous tirzepatide once-weekly for 30 weeks. Twenty-two patients living with MAFLD and T2D were studied (baseline, 3 and 6 mos). Plasma markers of hepatic dysfunction (ALT, AST, ALP, γGT and total bilirubin), cardiometabolic risk (triglycerides, total and non-HDL cholesterol, Apo-B100, HbA1c, 1,5-anhydroglucitol [1,5-AG]) and inflammation (hs C-reaction protein, TNF-α, IL-10/IL-6 ratio) were studied. Bioelectrical impedance analysis (BIA) was used to estimate phase angle (PhA), impedance ratio (IR), fat-free mass (FFM) and fat mass (FM).
Results: Significant reduction in HVF (P<0.05) and LFC percentage (P<0.001), IL10/IL-6 ratio (P<0.001) and ALT (P<0.001), γGT (P<0.001), Apo-B100 (P<0.05), and HbA1c (P<0.001) at 6 mos were observed. HbA1c was inversely correlated with 1,5-AG and factors significantly associated with severe fibrosis were IL-10/IL-6 and 1,5-AG (P=0.008) (by multivariate logistic regression analysis). 2 partecipants experienced a worsening of METAVIR score/US-FLI and metabolic/inflammation biomarkers. Dual therapy was well tolerated and most events were gastrointestinal (nausea, diarrhea, vomiting, abdominal pain, decreased appetite, and fatigue) and were mild or moderate in severity.
Conclusion: This research is subject to several limitations. The first is the small size of the simple. The second concerns the duration of treatment itself due to the addition of tirzepatide to pioglitazone; hence, it is difficult to distinguish the effect of the combination of drugs from that of long-term treatment. Notwithstanding these limitations, it may be argued that MASLD/T2D dual therapy (pioglidazone plus tirzepatide) was more effective than monotherapy (pioglidazone) with respect to reduction metabolic and LFC improvement (liver stiffness, and ALT levels). Body weight gain (subcutaneous fat increase) mediated by pioglitazone monotherapy decreased following use of tirzepatide. Dual therapy might be effective for the treatment of patients with MAFLD/T2D, as well as improving glycemic control and visceral obesity.

PO4.404

The Weight of Hormones: Exploring the Link Between Anti-Obesity Treatments and Menstrual Disorders

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Introduction: Obesity is a significant public health concern strongly associated with menstrual disorders. Elevated estrogen levels, resulting from the peripheral conversion of androgens to estrogens, are commonly observed in women with obesity. These hormonal alterations disrupt normal ovulation and contribute to menstrual irregularities, such as irregular bleeding, amenorrhea, and heavy dysfunctional uterine bleeding. Additionally, obesity is closely linked to polycystic ovary syndrome (PCOS), a condition that interferes with ovulation and fertility.
Methods: The research was conducted using the PubMed and LILACS databases with the search terms ('Anti-Obesity Agents' OR 'Obesity Management') AND 'Menstruation Disturbances,' yielding 77 articles published in the last 40 years. Following title and abstract screening, 18 studies were selected for detailed analysis.
Results: Four studies evaluated the effects of lifestyle modifications (LSM) in women with obesity and PCOS. These studies showed that weight loss, achieved through calorie-restricted diets or aerobic exercise, positively restores ovulatory cycles. One study examined sibutramine use in patients with obesity and PCOS, finding that both sibutramine and placebo combined with LSM increased the number of menstrual cycles after six months.
A review analyzed GLP-1 analogs and concluded that these agents, particularly liraglutide, are more effective than metformin in addressing the physical and metabolic features of PCOS. Moreover, they improve menstrual cyclicity.
Eleven studies focused on the effects of bariatric surgery on menstrual disorders in women with obesity and PCOS. Findings showed that, beyond short-term weight loss, bariatric surgery reduces the follicular phase duration, increases menstrual cycle regularity, and improves rates of spontaneous ovulation. In women with PCOS, bariatric surgery was associated with a 50–90% reduction in menstrual abnormalities.
Additionally, a cross-sectional study assessed bariatric surgery's impact on women with obesity and premenstrual syndrome (PMS), demonstrating that the procedure alleviated PMS symptoms. These improvements were attributed to weight reduction and associated changes in reproductive hormones.
Conclusion: Anti-obesity treatments significantly improve menstrual disorders, particularly in women with obesity and PCOS. Interventions such as lifestyle modifications, GLP-1 analogs, and bariatric surgery demonstrate positive effects on menstrual regularity, ovulation, and hormonal balance, offering promising therapeutic options.

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PO4.405

Effect of a complex lifestyle intervention on cognitive functions in sedentary adults with obesity

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Introduction: Physical inactivity is a leading factor that accelerates ageing and cognitive decline in attention, memory, and executive functions. Obesity may contribute to reduced brain plasticity and structural brain changes, that affect executive functions and memory. Here we examined the hypothesis that complex lifestyle intervention consisting of regular supervised exercise, dietary counselling and cognitive-behavioural therapy (CBT) can lead to favourable changes in body composition, physical performance and cognitive functions.
Methods: Volunteers (M=18/F=27; age=35.7±6.0 years) were phenotyped before and after the 3-month lifestyle intervention. Body composition was assessed via bioimpedance (OMRON BF511, Japan). Motor functions and strength were evaluated (preferred and maximal walking speed, back and leg strength, hand grip (dynamometry), biceps curl (arm strength), and the 5x sit-to-stand test (leg strength). Cognitive functions were assessed using standardized tests: Auditory Verbal Learning Test (AVLT), Digit Symbol Substitution Test (DSST), and Trail Making Tests A and B (TMT-A/B). Participants were randomised into intervention and control groups. The intervention included supervised aerobic-strength training 3x1h weekly, weekly nutritional counselling, and biweekly CBT.
Results: Lifestyle intervention improved body weight (107.1±16.6 kg vs. 98.1±16.4 kg, p<0.001) and body composition (muscle: 26.9±3.9% vs. 29.19±4.9%; fat: 41.2±7.4% vs. 36.6±8.9% and visceral fat: 12.5±4.3 vs.10.6±3.8, all p<0.001). The control group showed no significant weight change (102.9±13.2 kg vs. 102.0±12.0 kg, p=0.43) but did exhibit changes in body composition (muscle: 31.6±10.6% vs. 33.4±10.7%, p=0.02; fat: 38.1±10.6% vs. 35.0±11.4%, p=0.03) without a significant change in visceral fat (11.6±4.3 vs. 11.3±3.3, p=0.64). Regular exercise increased back and leg muscle strength (102.0±34.6 kg vs. 116.9±33.3 kg, p=0.004), maximal walking speed (2.38±0.6ms-1 vs. 2.61ms-1, p<0.001) and tended to increase preferred walking speed (1.3±0.3 m/s vs. 1.4±0.2 m/s, p=0.06). No changes in leg and back muscle strength (95.8±39.9 kg vs. 106.7±35.4 kg, p=0.20) or walking speed (p>0.05) were observed in the control group. Working memory and psychomotor speed (DSST, p=0.004) along with processing speed (TMT-A, p=0.02; TMT-B, p=0.007) improved in the intervention group. Despite significant increase in DSST score (p=0.002), no change in processing speed (TMT-A, p=0.2; TMT-B, p=0.7) were observed in control group. When compared differences in times for TMT A and TMT B (cognitive flexibility) between groups, the control group had significantly longer time in task switching after 3-month (p<0.05).
Conclusion: A relatively short comprehensive lifestyle intervention involving regular exercise training and weight loss enhances physical and cognitive performance in patients with obesity. Regular exercise should be an integral part of the complex obesity management.

PO4.406

Nutrient and Food Group Intake in Patients with Type 2 Diabetes: Associations with Weight Status and Obesity Risk

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Introduction: The nutrient composition and food group intake of individuals with Type 2 Diabetes (T2D) play a pivotal role in weight status and obesity risk. Identifying specific dietary patterns associated with obesity can guide tailored interventions for this vulnerable population. This study aimed to evaluate the associations between nutrient intake, food group consumption, and weight status in patients with T2D, emphasizing dietary components that may influence obesity risk.
Methods: A cohort of T2D patients was analyzed for energy, macronutrient, and micronutrient intake, as well as food group consumption (fruits, vegetables, whole grains, dairy, and processed foods). Anthropometric data, including body mass index (BMI) and waist circumference, were collected to classify weight status. Correlations and regression analyses explored relationships between dietary components and obesity-related parameters.
Results: Patients with higher intakes of fruits, vegetables, and whole grains exhibited significantly lower BMI and waist circumference values. Conversely, higher consumption of processed and energy-dense foods was associated with elevated obesity metrics. Inadequate protein and fiber intake were prevalent among individuals with higher weight status, while saturated fat intake exceeded recommended levels across all groups. Suboptimal micronutrient intake, particularly of magnesium and potassium, was linked to poorer weight outcomes and increased obesity risk.
Conclusion: The findings highlight the critical influence of nutrient composition and food group intake on weight status in patients with T2D. Emphasizing nutrient-dense, whole foods and reducing processed food consumption are essential strategies for addressing obesity risk in this population. These results underscore the importance of dietary interventions focusing on balanced nutrient intake and improved food group choices to support weight management and overall health in T2D patients.

PO4.407

Long-Acting Injectable Antiretroviral Therapy in a Patient with HIV and Morbid Obesity Undergoing Bariatric Surgery: A Case Report

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Background: Combined antiretroviral therapy (cART) has extended the life expectancy of people living with HIV (PLH) matching the general population. Consequently, age-related comorbidities, including obesity, are increasingly prevalent. Bariatric surgery, such as Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG), effectively addresses obesity but alters gastrointestinal anatomy, potentially impairing antiretroviral drug (ARV) absorption. Nucleoside reverse transcriptase inhibitors (NRTIs), such as tenofovir, rely on passive absorption in the proximal small intestine and may be significantly affected by RYGB. Protease inhibitors (PIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs), which require gastric acid and bile salts, are similarly impaired post-surgery. Conversely, integrase strand transfer inhibitors (INSTIs) and entry inhibitors (EIs), which also rely on passive diffusion, are less affected. The choice of a surgical technique—either restrictive, malabsorptive, or mixed—must account for ARV pharmacokinetics to maintain therapeutic drug levels. Long-acting injectable ARVs bypass gastrointestinal barriers, providing an effective alternative for PLH undergoing RYGB.
Case: A 56-year-old male with morbid obesity (BMI:44), grade B esophagitis, controlled HIV (undetectable viral load), type 2 diabetes, hypertension, and dyslipidemia were evaluated for RYGB. To address potential absorption issues, his oral cART regimen (tenofovir, emtricitabine,

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dolutegravir) was transitioned to long-acting injectable cabotegravir and rilpivirine. The first dose was administered six weeks preoperatively via ultrasound (US)-guided intramuscular (IM) injection to ensure precise delivery, especially important in high BMI patients. The RYGB procedure was completed without complications (Clavien-Dindo 0).
Postoperatively, the patient achieved significant weight loss (BMI reduced to 35.4), improved glycemic control (fasting glucose 4.57mmol/L), and reduced antihypertensive medication needs. HIV management remained stable, with a minor viral load increase (from undetectable to 33.5copies/mL) that was clinically insignificant. The patient adhered to bi-monthly injectable cART and expressed satisfaction with treatment outcomes.
Discussion: Gastrointestinal changes after RYGB impair ARV absorption, particularly for NRTIs, PIs, and NNRTIs, increasing the risk of subtherapeutic drug levels and virologic failure. Long-acting injectable ARVs, administered via US-guided IM injection, bypass these absorption barriers and maintain consistent plasma drug levels, ensuring virologic control. This case underscores the importance of US-guided injections for accurate drug delivery in high BMI patients. The patient's weight loss and metabolic improvements demonstrate the compatibility of injectable cART with bariatric surgery. Adherence monitoring and viral load assessment are crucial to prevent rebound risks and ensure therapeutic success.
Conclusion: Long-acting cART delivered via US-guided IM injection is a safe, effective alternative to oral regimens in bariatric surgery patients, ensuring sustained virologic suppression and metabolic benefits in PLH.

PO4.408

Determination of normality values for sarcopenia in young and middle-aged adults with obesity in an obesity program at a tertiary care institution in Mexico City

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Introduction: Obesity is a chronic disease that is associated with the development of sarcopenia. The coexistence of both conditions, known as sarcopenic obesity, represents a significant health risk. However, most studies on this association have focused on older adults and populations from

Tab. 1. Anthropometric, clinical, and sarcopenia characteristics in the population, stratified by sex and age group.

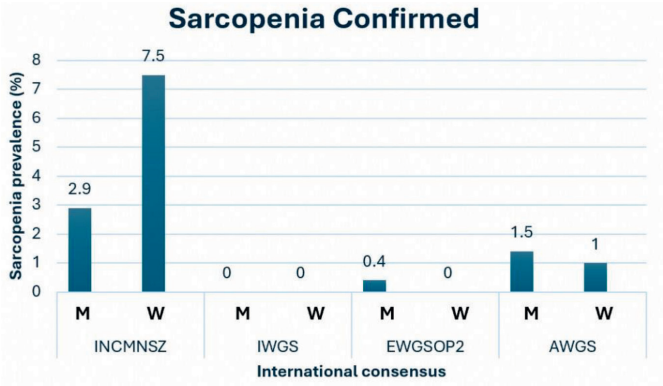
Characteristics	All (n = 402)	Women (18 to 39 y) (n = 123)	Women (40 to 60 y) (n = 161)	P value	Men (18 to 39 y) (n = 50)	Men (40 to 60 y) (n = 68)	P value
Age, median (IQR), years	42.0 (33– 49)	30.0 (26 – 36)	49.0 (46–53)	**<0.001**	32.0 (29–36)	46.0 (43–50)	**<0.001**
Weight, median (IQR), kg	110 (97.5–127)	110 (98.5–123)	103 (92.8–116)	**0.020**	123 (112–153)	123 (106–144)	0.253
BMI, median (IQR), kg/m^2	41.5 (37–47.4)	41.1 (38–47.0)	42.1 (37–47.4)	0.988	41.4 (37–47.4)	40.9 (36–48.6)	0.556
- Obesity grade 1, (%)	49 (12.2)	11 (8.9)	22 (13.8)	0.547	5 (10.0)	11 (16.2)	0.689
- Obesity grade 2, (%)	110 (27.4)	36 (29.3)	41 (25.6)		14 (28.0)	19 (27.9)	
- Obesity grade 3, (%)	243 (60.4)	76 (61.7)	98 (60.8)		31 (62.0)	38 (55.8)	
Physical activity ≥150 min/week, n (%)	95 (23.6)	32 (26.0)	32 (20.0)	0.220	13 (26.0)	18 (26.5)	0.954
Prediabetes, n (%)	112 (28.3)	23 (18.5)	60 (37.7)	**0.001**	11 (22.4)	18 (27.7)	0.525
Type 2 Diabetes, n (%)	90 (22.8)	13 (10.7)	41 (25.8)	**0.001**	14 (28.6)	22 (33.8)	0.788
Hypertension, n (%)	169 (42.8)	29 (23.8)	77 (48.4)	**<0.001**	23 (46.9)	40 (61.5)	0.568
Hypertriglicerydemia, n (%)	158 (39.9)	48 (39.4)	52 (32.7)	0.249	24 (49.0)	34 (51.5)	0.791
Hypoalphalipoproteinemia, n (%)	115 (29.0)	28 (22.9)	37 (23.3)	0.950	22 (44.9)	28 (42.4)	0.433
hypercholesterolemia, n (%)	104 (26.3)	27 (22.1)	42 (26.4)	0.408	13 (26.5)	22 (33.3)	0.121
Sarcopenia Parameters							
SARC-F5, clinical suspicion, n (%)	59 (14.7)	15 (12.2)	35 (21.7)	**0.036**	3 (6.0)	6 (8.8)	0.653
Grip strength, median (IQR), kg	23.8 (19.–31)	23.3 (20–26)	20 (16–24.3)	**<0.001**	35.8 (30–41)	36.3 (28–42)	0.976
Chair stand, median (IQR), seconds	11.3 (9.3–14)	10.7 (9.0–13)	12.4 (10–15.5)	**<0.001**	10.3 (8.8–12.6)	11.2 (9.7– 4.3)	0.056
BIA-SMM, median (IQR), kg/height^2	5.6 (4.9–6.3)	5.5 (4.9–5.9)	5.1 (4.6–5.7)	**0.010**	6.5 (5.9–7.1)	6.1 (5.5–6.9)	0.103
Gait speed, median (IQR), mt/s	1.4 (1.2–1.6)	1.4 (1.3–1.6)	1.3 (1.1–1.6)	**0.029**	1.4 (1.2–1.7)	1.5 (1.3–1.7)	0.972
* Sarcopenia confirmed, n (%)	22 (5.47)	6 (4.9)	12 (7.5)	0.377	2 (4.0)	2 (2.9)	1.0
** Sarcopenia severity, n (%)	3 (0.74)	2 (1.6)	0 (0.0)	0.98	1 (2.0)	0 (0.0)	1.0

SD standard deviation, BMI body mass index, IQR interquartile range, BIA Bioelectrical impedance analysis, SMM total body skeletal muscle mass, * Sarcopenia confirmed (low muscle strength + low muscle quantity), ** Sarcopenia severity (sarcopenia confirmed + low physical performance).

SD standard deviation, BMI body mass index, IQR interquartile range, BIA Bioelectrical impedance analysis, SMM total body skeletal muscle mass, * Sarcopenia confirmed (low muscle strength + low muscle quantity), ** Sarcopenia severity (sarcopenia confirmed + low physical performance).

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Anglo-Axo (IWGS), Europe (EWGSOP2) and Asia (AWGS). As a result, there is a considerable gap in terms of cut-off points for younger populations and those of Latin American origin, particularly in the Mexican population with obesity. We aimed to estimate muscle strength, appendicular musculoskeletal mass, and physical performance in patients aged 18 to 60 years with obesity attending a third-level Obesity Clinic in Mexico City.
Methods: Muscle strength was evaluated using grip strength (GS) and the chair-stand test (CS). Muscle mass was measured using dual-energy X-ray absorptiometry (DXA) with total body appendicular skeletal muscle mass (SMM). Physical performance was assessed through the standard gait-speed test (gait). The cut-off point for each parameter was determined as the value that fell within the first or upper quintile based on the respective test, stratified by sex and age group (young 18 to 39 years and middle-aged 40 to 60 years). Additionally, we compared the prevalence of sarcopenic obesity using the cut-off points from the International Consensus on Older Adults against the quintiles obtained in our population.
Results: A total of 402 patients were included in this study; 70.6% were women. The median age was 42.0 (33 – 49) years, BMI was 41.5 (37.4 – 47.4) kg/m2, and obesity classification (grade I: 12%, grade II: 27.4%, grade III: 60.4%). Middle-aged women had a higher prevalence of diabetes (25.8% vs. 10.7%, p<0.001) and hypertension (48.4% vs. 23.8%, p<0.001) than young women, respectively; there was no difference between metabolic disorders in younger and middle-aged men. The cut-off sarcopenia parameters were evaluated with quintiles, stratified by sex and age, women (young: GS <18.6 kg, CS >13.3 s, SMM <4.84 kg/height2, gait <1.23 mt/s), and middle-aged: GS <14.3 kg, CS >16.4 s, SMM <4.50 kg/height2, gait <1.07 mt/s), men (young: GS <29.0 kg, CS >13.2 s, SMM <5.79 kg/height2, gait <1.13 mt/s), and middle-aged: GS <27.2 kg, CS >15.5 s, SMM <5.26 kg/height2, gait <1.22 mt/s). There were significant differences in sarcopenia parameters between men and women. Women in the middle-aged group showed a higher prevalence of sarcopenia, but this was not statistically significant compared with young women (7.5% vs 4.9%, p=0.09), and men (4.0% vs 2.9%, p=1.0). Comparing our cut-off (age reference group 40-60 years) with international consensus (60 to 65 years), there were fewer patients with sarcopenia criteria with IWGS (W 0%, M 0%), EGWSOP2 (W 0%, M 1.5%), AWGS (W 1.2, M 1.5%), compared with our cohort (W 7.5%, M 2.9%), p<0.0001.
Conclusions: Our cut-off points for sarcopenia differ from those established by international consensus, emphasizing the need for specific criteria for younger and middle-aged, severity BMI, ethnic groups and preexisting comorbidities.



International Working Group on Sarcopenia (IWGS) and European Working Group on Sarcopenia in Older People (EWGSOP), Asian Working Group for Sarcopenia (AWGS), Instituto Nacional de Ciencias Médicas y Nutrición "Salvador Zubirán (INCMNSZ).

Fig. 1. Comparison of sarcopenia prevalence using the international consensus and the INCMNSZ cohort cut-off.

PO4.409

Brown adipose tissue activity and energy expenditure in women with different obesity metabolic phenotypes

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Introduction: The interrelationships of brown adipose tissue (BAT) with better cardiometabolic health and reduced adiposity opens the opportunity to better understand the influence of BAT in cardiometabolic health and their role as a potential therapeutic target for obesity. **Aim:** Compare BAT activity and energy expenditure (EE) after cold exposure in women with metabolically healthy obesity (MHO), metabolically unhealthy obesity (MUO) and metabolically healthy eutrophy (MHE) and associate the BAT activity with cardiometabolic health parameters.
Methods: Cross-sectional, 88 women (31 MHO, 19 MUO, 38 MHE) aged between 20 and 40. The MHO group had normal blood pressure, glucose and lipid profile, whereas the MUO group had at least two metabolic alterations in these metabolic parameters. The BMI of eutrophy was <25.0 kg/m² and obesity >30.0 kg/m². BAT activity was assessed by the infrared thermography in the supraclavicular area after 2 hours of cold exposure (18ºC). BAT activity was assessed as the area under the curve (AUCtemp) of relative temperature (difference between the temperature in supraclavicular area [interest] and chest area [control]) during the cold exposure. Were considered as cardiometabolic health parameters: BMI, waist circumference (WC), neck circumference, sagittal abdominal diameter, visceral adipose tissue (VAT; by DXA), glycemic (fasting glucose, HOMA-IR, and glycated hemoglobin) and lipidic (LDL-cholesterol, HDL-cholesterol, total cholesterol and triglycerides) profiles, and the number of cardiovascular risk factors. In a subsample (9 MHE, 6 MUO, and 4 MHO), EE was measured by indirect calorimetry before and after cold exposure at rest. The difference between post-exposure EE and pre-exposure EE (dEE) was considered to evaluate the influence of cold exposure in the increase of EE. The association between cold-induced BAT activity (AUCtemp) and cardiometabolic health parameters was tested using multiple linear regression adjusted for age and body fat %. To test the BAT activity and dEE among the metabolic phenotypes were considered Kruskal Wallis and One-way ANOVA tests.
Results: MHO and MUO groups had similar body fat % (p>0.05). The BAT activity did not differ among metabolic phenotypes however, the MHE (199.8 kcal) showed higher dEE compared to MUO (-21.8 kcal) [p=0.010]. AUCtemp was associated with BMI (β = -5.77; P=0.011), neck circumference (β = -6.55; P=0.014), sagittal abdominal diameter (β = -12.55; P=0.008), fasting glucose (β = -2.42; P=0.054), HOMA-IR (β = -7.11; P=0.015), VAT (β = -0.04; P=0.047), and number of cardiovascular risk factors (β = -18.33; P=0.025).
Conclusion: The results suggest that a higher BAT activity was associated with lower number of cardiovascular risk factors, lower abdominal fat, and better glycemic profile. Although metabolic phenotypes had no difference in BAT activity, MHE individuals showed a higher increase in energy expenditure (EE) after cold exposure compared with those with MUO and MHO. This indicates that the capacity to increase energy expenditure in response to cold could be more effective in individuals with a healthy weight, even with no differences in BAT activity.

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PO4.410

Real life experience following patients with obesity under farmacological treatment

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Introcuction: Obesity is a chronic metabolic disease characterized by an increase of body fat stores. The accumulation of intra-abdominal fat is a marker for higher metabolic and cardiovascular disease risk. The assessment of body composition has become increasingly important for research and health professionals, in order to quantify tissue changes in response to nutrition, exercise, surgical, and pharmaceutical interventions. DXA system estimates for visceral adipose tissue (VAT) has a similar relationship to other biomarkers of metabolic health as does VAT measured by computed tomography (CT). Coefficients of variation of DXA are 1.7% for body fat and 2.4% for lean soft tissue mass

Aim: Evaluate changes in body composition associated to GLP1 analogues treatments.

Methods: We have included 120 patients evaluated in the Cardiometabolic unit (cardiology; endocrinology, nutrition specialist). The body composition was measured by DXA Prodigy (GE Healthcare), in order to compute total and regional fat, especially, abdominal, VAT and appendicular lean mass. The cardiological evaluation included an epicardic fat measure evaluation by echocardiography (Versana Escential GE). Biochemicals determination were performed at basal time (glycemia; insulin; Cholesterol; LDL; triglycerides; GOT; GPT, GGT, Amylase, protein C reactive, HbA1C). The statistical analysis was performed by SPSS. T-Test to compare means (p<0,05) between basal and control determinations. Lineal Regression was used to predictive analysis (glycemia; cholesterol, insulinemia) as predictor factors of visceral fat mass.

Results: We included 125 patients:

Women: N: 91 women; range of age: 20-80 y.o; BMI:35,86±4,47kg/m2. Total Fat mass: 37,4-69,5%; visceral Fat mass: 1,500 ±0,632kg; Men; N: 34; range of age 18-71 y.o; BMI 35,45± 5,03kg/m2. Abdominal Visceral fat was related to Insulin (R: 0,337;;p: 0,00); glycemia (R: 0,261; p: 0,021);). Patients treatments were: Rybelsus: 11,9%; Ozempic: 27%; Wegovy: 15,9%; Mounjaro: 11,9%. First evaluation was at 10,5±6,0 months. We found a significant diminution at weight (-8,000kg); total fat mass (-6,247kg); legs fat mass (-1,988kg) visceral fat mass (-0,520kg) and epicardial fat mass (long axis: -2,031mm; short axis: -1,73mm). Table Not significant changes were observed at total lean mass and neither in appendicular lean mass. From the biochemical parameters, there were significant decreases in glycemia levels without modifying the rest of the evaluated parameters.

Conclusion: This first evaluation provides us with preliminary information on the compartmental changes of fat with metabolic impact, beyond weight changes.

Tab. 1. Fat Mass. Evolutive Changes.

	Basal	Control	p
Weigth (kg)	93,066±13,8	85,856±13,969	0,000
Total Fat Mass (kg)	44,226±19,277	37,978±10,599	0,000
Abdominal Fat Mass (kg)	4,354±0,921	3,858±1,104	0,000
Visceral Fat -VAT- (kg)	2,102±1,028	1,5081±0,697	0,000
Legs Fat Mass (kg)	14,261±5,571	12,273±5,103	0,000
Epicardial fat Long Axis (mm)	10,312±2,681	8,363±1,865	0,000
Epicardial fat Short Axis (mm)	10,100±2,243	8,363±2,078	0,000

Evolutive changes. All parameter evaluated by DXA showed a significant diminution except arms fat mass. Epicardial fat showed asignificat diminution.

PO4.411

Effects of Sodium-Glucose Cotransporter 2 Inhibitor Use on Fasting Serum Ketone Concentrations in Adults with Severe Obesity Completing a Meal Replacement Programme

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Introduction: The use of Sodium-Glucose Cotransporter 2 inhibitor (SGLT2i) drugs is associated with a higher risk of euglycaemic diabetic ketoacidosis. We have previously shown that in adults with severe obesity undergoing a milk-based meal replacement programme, weight loss was proportional to increases in fasting serum ketone concentrations over eight weeks. We sought to determine whether SGLT2i use was associated with differences in fasting serum ketone concentrations at baseline in people with severe obesity, and whether changes in fasting serum ketone concentrations with diet-induced weight loss were different in people taking SGLT2i drugs.

Methods: In this single-centre, prospective cohort study of people with severe obesity who completed a milk-based meal replacement programme, fasting serum beta-hydroxybutyrate levels were measured at baseline and after eight weeks. Fasting ketone concentrations in SGLT2i users and non-users at baseline were compared with the Wilcoxon Rank Sum Test and differences in changes in ketone concentrations over time between the groups were assessed with linear regression modelling.

Results: 74 (62%) of 120 participants completed the programme (mean age 49.2±11.9 years; 40% male, 32.4% with diabetes). Seven (9.5%) of the participants were taking an SGLT2i drug. There was no difference in median baseline fasting ketone concentrations by SGLT2i drug use status (non-users 90 [70, 130] µmol/l versus 120 [90, 350] µmol/l in SGLT2i drug users (p=0.099). In linear regression analyses, the percentage change in fasting ketone concentration at eight weeks was lower in SGLT2i users (β=-508.4 [-978.9, -37.8], p=0.035) after adjusting for age, sex, diabetes status and weight loss at eight weeks.

Conclusion: These preliminary data suggest no adverse effects on physiological ketosis from therapeutic dietary restriction in people with severe obesity taking SGLT2i drugs. However, our unexpected finding that SGLT2i drug use attenuated increases in fasting serum ketone concentrations with dietary restriction warrants further investigation in larger prospective studies.

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PO4.412

Unraveling the Impact of Obesity on Premenstrual Syndrome: Insights into Eating Habits, Weight Loss, and Premenstrual Symptoms

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Introduction: Premenstrual syndrome (PMS) encompasses physical, emotional, and behavioral symptoms occurring before menstruation, significantly affecting women's quality of life. Changes in sex steroids and neurotransmitters play a central role in PMS pathogenesis. Additionally, factors such as genetic predispositions, diet, and nutritional deficiencies contribute to PMS development. Altered eating patterns are commonly observed in women with PMS. Understanding the impact of obesity and anti-obesity treatments on PMS could improve management strategies and patient outcomes.
Methods: A literature search was conducted in PubMed, Google Scholar, and LILACS databases using the keywords "Obesity" AND "Premenstrual Syndrome," yielding 89 articles published between January 1990 and January 2025. After screening titles and abstracts, 20 studies were selected for detailed analysis.
Results: Eight studies explored the link between obesity and PMS. Five reported more severe PMS symptoms in women with obesity, while three associated premenstrual dysphoric disorder (PMDD) with an elevated obesity risk. Poor sleep quality in women with obesity was linked to unhealthy eating behaviors. Eight studies noted a correlation between PMS and higher caloric intake, particularly fats and carbohydrates. Two studies found that eating disorders were more frequent in PMS patients, irrespective of BMI or body composition.
Low vitamin D levels were associated with PMS in two studies. High intake of sodium, biotin, calories, fat, sugar, and fiber was identified as a risk factor for PMS. Weight loss, especially through alternate-day fasting, was shown to improve PMS symptoms. Calorie restriction and aerobic exercise significantly reduced PMS symptoms in women with obesity, while physically active women reported fewer symptoms. Bariatric surgery demonstrated improvements in PMS symptoms, largely due to weight loss and associated hormonal changes.
Conclusion: Obesity and unhealthy eating habits are strongly associated with increased PMS prevalence and severity. Women with PMS are at heightened risk of developing eating disorders and obesity. Weight reduction strategies, including dietary interventions, exercise, and bariatric surgery, have been shown to improve PMS symptoms in women with obesity. These findings highlight the importance of addressing obesity and its related factors as part of comprehensive PMS management.

PO4.413

Efficacy of Glucagon-Like Peptide Receptor Agonists (GLP-1 RAs) in Improving Metabolic and Reproductive Outcomes in Women with Polycystic Ovary Syndrome

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Background: Polycystic ovary syndrome (PCOS) is a complex endocrine-metabolic disorder with a multifactorial etiology, presenting challenges in both diagnosis and management. Key features include hyperandrogenism, dysregulated luteinizing hormone (LH) and follicle-stimulating hormone (FSH) secretion, and increased insulin resistance. Treatment strategies focus on managing symptoms such as menstrual irregularities, hyperandrogenism, and insulin resistance through interventions like weight control and anti-androgen therapies. Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have emerged as a promising approach, demonstrating benefits such as weight loss, hormonal balance, restoration of ovulation, and enhanced fertility, making them a viable option for improving metabolic and reproductive outcomes in PCOS.
Methods: An integrative review was conducted using PubMed, Embase, and Cochrane databases from January 2008 to December 2024. The following search terms were employed: ((Polycystic Ovary Syndrome OR PCOS) AND (Obesity OR Obese Women) AND ("GLP-1 receptor agonists" OR "glucagon-like peptide-1" OR liraglutide OR exenatide) AND (Weight Loss OR Body Mass Index OR Insulin Resistance OR Abdominal Fat OR Visceral Fat OR Metabolic Parameters OR Hormonal Parameters)). From 436 articles retrieved, 286 remained after duplicate removal. Exclusions based on population, animal studies, and unrelated interventions reduced the pool to 90 abstracts, of which 38 studies met the inclusion criteria for detailed analysis.
Results: GLP-1 RAs demonstrated superior efficacy compared to metformin in reducing weight and body mass index (BMI), with significant reductions in abdominal circumference, visceral fat, and hepatic fat. Addressing insulin resistance, Andrea Etrusco (2024) reported prediabetes remission rates of 56% with exenatide monotherapy, 64% with exenatide combined with metformin, and 32% with metformin monotherapy. Jensterle et al. (2015) highlighted liraglutide's greater reductions in fasting glucose (-0.59 mmol/L, $P < 0.001$) and fasting insulin (-1.52 mU/L, $P = 0.01$) compared to metformin alone.
Reproductive health outcomes also improved with GLP-1 RAs. Renyuan Li et al. (2022) reported spontaneous conception rates of 29.2% in women treated with exenatide versus 14.7% in the metformin group ($P = 0.03$). Alyse Goldberg et al. (2024) observed significantly higher ovulation rates and regularized menstrual cycles with exenatide ($P < 0.05$). While effects on testosterone and sex hormone-binding globulin (SHBG) were inconsistent, GLP-1 RAs demonstrated anti-inflammatory properties and enhanced the metabolic environment, indirectly improving ovulation and reproductive outcomes.
Conclusion: GLP-1 RAs, such as liraglutide and exenatide, outperform metformin in managing obesity and improving metabolic and reproductive parameters in PCOS. These agents promote weight loss, glycemic control, ovulation, and fertility, particularly in women with obesity or insulin resistance. When combined with metformin, they offer synergistic benefits, solidifying their role as a key therapeutic option in PCOS management.

PO4.414

The efficacy of innovative software-based practical portion size estimation aids in weight loss: a retrospective cohort study of 12-month dietary intervention

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Introduction: The prevalence of obesity is increasing worldwide and it is one of the biggest public health problems; the World Health Organization calls this epidemic of overweight and obesity "globesity". Portion sizes play a significant role in influencing energy intake and larger-than-appropriate food consumption increases the risk of gaining weight. This study evaluates the effectiveness of a diet based on portion size measurement aids as a weight management strategy for adults affected by overweight or obesity.
Methods: This retrospective cohort study included adult patients from a private clinic in Bergamo (Italy) aged ≥18 - <70 years with baseline body mass index (BMI) ≥ 27,5 kg/m². Patients were followed up periodically every two months for a total length of at least 12 months. The exclusion criteria was the prescription of a medication to treat overweight and obesity during the study period. All patients were visited by a certified clinical nutrition specialist medical doctor, then a registered dietitian tailored every dietary prescription using HandyDiet, a software that makes possible using individual hands (with different sizes) and other practical tools as portion size estimation aids. An automatic system was developed to analyze the 3D scan of the patient's hand; the accuracy of the instrument

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was certified by Polytechnic University of Milan (PoliMi). The software allowed the conversion between the prescribed food portions and the anthropometric parameters of the hand (hand, fist, palm, finger, etc.). The diet prescription could be flexibly managed through the dedicated web-app. Weight and body composition were assessed using tetrapolar bioelectrical impedance analysis (InBody 720).

Results: The study included 104 individuals of whom 64 (61,5%) were women. At the baseline the mean age was 45 years (19 - 68 years) and the average BMI was 31,8 kg/m² (27,5 - 54,5 kg/m²), corresponding to a weight of 86,9 kg (58,0 - 124,6 kg). After 12 months of dietary intervention, patients lost an average of 9,13% of their enrollment body weight. BMI decreased from 31,8 to 28,8 kg/m² and weight was reduced from 86,9 kg to 79,4 kg.

Conclusion: This study has shown appreciable results in terms of weight loss, using a practical dietary approach focused on encouraging compliance to the diet; the prescription was individualized and tailored to align the patient's personal nutritional requirements, with unique lifestyle, tastes, food restrictions and preferences. The use of readily accessible practical portion size estimation aids, such as the individual's hand, has proven useful in regulating portion sizes over the first 12 months, promoting both acceptability and a flexible approach to the diet prescription. Additional research is needed to assess the long-term effectiveness and adherence to this dietetic approach, as well as to replicate and confirm these findings in other independent studies.

PO4.415

Usefulness of the lipidomic-based OWLiver test for the identification of patients with obesity-associated steatotic liver disease

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Introduction: Metabolic dysfunction-associated steatotic liver disease (MASLD) is a leading chronic liver disease with an estimated prevalence of 32% among the adult population. The strongest risk factors for MAFLD are obesity and type-2 diabetes (T2D). Prospective studies have shown that people with obesity have a 3.5-fold increased risk of developing MASLD compared to those with normal weight and it is estimated that its more severe form, metabolic dysfunction-associated steatohepatitis (MASH), affects 38% of them.

Guidelines recommend the screening of MASLD in high-risk groups, such as patients with obesity or T2D, and referred to hepatologists when appropriate. However, there is an unmet need for non-invasive tests (NITs) to identify patients who are at risk of increased liver outcomes and all-cause mortality, defined as MASH with NAFLD activity score (NAS) ≥ 4 and fibrosis stage ≥ 2 ("at-risk MASH"). This study aims to evaluate OWLiver test and its algorithm MASEF score as a tool to screen for at-risk MASH in patients with obesity, and directly compare it with liver stiffness measurement (LSM) by vibration-controlled transient elastography (VCTE) (Fibroscan), and FibroScan-AST (FAST).

As secondary aim, MASEF score is assessed in patients under lipid-lowering medication (LLM). Obesity is the most common cause of secondary hyperlipidemia, and patients with MASLD are twice as likely to exhibit plasma lipid abnormalities as those without. The use of LLM can potentially affect the analytes included in the score.

Methods: The study included patients from tertiary care centers. MASEF, FAST and LSM performances were compared to liver biopsy for the assessment of at-risk MASH. Performances were evaluated by means of area under de curve (AUC) vs. biopsy in groups of body mass index (BMI). Biopsies were assessed by NASH CRN criteria.

Results: A total of 265 patients with obesity and MASLD were included in the NITs comparative study. Participants were predominantly males (53%), with a mean age of 56.9 (±9.5) years old and an incidence of T2D of 69%. The prevalence of at-risk MASH according to the BMI was: 47% for BMI < 35 kg/m² (n=150), 43% for BMI between 35-40 kg/m² (n=75); 33% BMI ≥ 40 kg/m² (n=39).

MASEF, FAST and VCTE performances were, respectively: BMI < 35 kg/m², AUC = 0.78 / 0.75 / 0.78; BMI 35-40 kg/m², AUC = 0.77 / 0.74 / 0.75; BMI ≥ 40 kg/m², AUC = 0.79 / 0.75 / 0.65. Not statistical differences were found among the NITs, except for LSM that showed statistically lower AUC in the BMI ≥ 40 kg/m² group (FAST vs. LSM: $p < 0.01$, MASEF vs. LSM: $p < 0.01$).

An independent a retrospective cohort of 343 patients with obesity and MASLD was used for the dyslipidemia treatment study. Patients under LLM were older (54 vs. 48 years old) and had higher HbA1c (7.2% vs. 6.5%) compared to those not using therapy. The performance of the MASEF score was consistent across both groups.

Conclusion: MASEF score shows acceptable accuracy for the detection of at-risk MASH in patients with obesity. MASEF and FAST outperformed VCTE accuracy in these patients. The performance of MASEF score remains robust regardless of whether they are on lipid-lowering therapy.

PO4.416

Multilevel analysis of individual heterogeneity and discriminatory accuracy (MAIHDA) to understand how obesity risk varies according to multiple lifestyle behavior recommendations

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Introduction: The combined and interactive effects of lifestyle behaviors such as physical activity, diet, sleep, alcohol intake, and smoking on obesity risk are poorly understood. MAIHDA is a novel approach that allows investigation of high-order interactions through multilevel analysis of individuals nested within intersectional groups or strata [1]. This study aimed to use MAIHDA to examine the combined and interactive effects of meeting vs. not meeting the public health recommendations of five key lifestyle behaviors on obesity risk.

Methods: The sample comprised of 139,540 men and 125,455 women aged 40-69 years from the UK Biobank study. Self-reported physical activity, fruit and vegetable consumption, sleep duration, alcohol intake, and smoking status were re-categorized as meeting vs. not meeting public health guidelines (e.g. consuming 5 portions of fruit and vegetables daily), and combined to create 48 unique strata. The outcome was obesity status (BMI ≥ 30: obesity and BMI 18.5 – 24.9: normal weight). MAIHDA models were fit with individuals (level 1) nested within strata (level 2). Model 1 was a null random-intercept model with no predictor variables. Model 2 additionally included main effects for the five lifestyle behaviours used to define the strata. For each model, the Variance Partition Coefficient (VPC) was computed to describe the proportion of variance in obesity status due to differences between strata. The Proportional Change in Variance (PCV) between model 1 and model 2 was also calculated to understand the amount of between-stratum variance that is "explained" by adding fixed parameters to the model.

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Results: Almost a quarter (23.2%) of women, and 17.3% of men had obesity. Men and women in the strata with the lowest probability of obesity met most of the lifestyle recommendations, and those in the strata with the highest probability of obesity met few of the recommendations. The VPCs from model 1 showed that 7.1% (men) and 5.6% (women) of the total variance was explained by differences between strata (as opposed to between individuals within strata). The VPC estimates reduced in model 2 (0.52% for men and 0.12% for women) indicating that the between-strata differences in the probability of obesity are mostly explained by the main additive effects (as opposed to interactive effects).
Conclusions: Using MAIHDA, this study highlights that additive effects predominately explain the differences in obesity risk among the key lifestyle behaviour combinations. Therefore, meeting a greater number of individual public health lifestyle recommendations is important in mitigating obesity risk.

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Conflict of Interest: None disclosed

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PO4.417

Sexual functioning in persons with obesity seeking weight reduction

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Background: Many individuals with obesity pursue weight loss for the anticipated health benefits. Sexual behavior and functioningis an important aspect of quality of life but it's not frequently documented in persons with obesity. The present study was undertaken to assess rates of sexual dysfunction among persons with obesity seeking weight loss.
Methods: This study used baseline data of two year of the patients followed in the endocrinology department at Mohammed VI University Hospital. Sexual functioning was assessed by the Female Sexual Function Index (FSFI) and the International Index of Erectile Function (IIEF). Data of the survey were collected prospectively during the participants visit and through phone calls, except comorbidity data which was confirmed retrospectively. Eligible participants required to be 18 years or older, have a BMI between 30 and 50 kg/m² in a committed relationship, as defined by being married or being in another committed relationship (engaged). A score of ≤ 5 on the desire subscale indicates hypoactive sexual desire disorder (HSDD), while a total FSFI score of ≤ 26.55 suggests female sexual dysfunction (FSD). Lower scores on the IIEF indicate reduced satisfaction and greater dysfunction. Men scoring < 26 on the erectile function subscale are classified as having erectile dysfunction (ED).
Results: Baseline included 112 patients per tow year, the mean age of participants was 42,16 years +/- 13,3. The mean BMI was 41,63 kg/m2.Eighty patients meet the inclusion criteria and consented to participate in the survey. The mean age of participants was 43,16 years (range = 28 to 58 years). The mean BMI was 37 kg/m2 for men and 43 kg/m2 for women. Eighty percent of patients had metabolic syndrome, 45 percent treated for hypertension and 62 percent reported diagnosis of diabetes type 2.
Based on the FSFI total score 58 percent of women reported a sexual dysfunction. 90 percent of females are defined having HSDD with score ≤ 5 on the desire subscale, the mean score was 2.8. The other FSFI subscales were quite similar. Score on Lubrication, Orgasm, Arousal, Pain and satisfaction were 3.4, 3.4, 3.4 and 3.2, respectively. There was no significant difference between patients with obésity Class 1,2 and obésity Class 3 in the different areas of sexual dysfunction.
Seventy percent of men were identified as experiencing ED, based on the erectile function domain score of the IIEF. The mean of all the IIEF domains, Erectile Function, Orgasmic Function, Sexual Desire, Intercourse Satisfaction, and Overall Satisfaction domains were 15, 8.3,6.6 and 6.6, respectively. Based on the erectile function domain score,7 percent of men reported Severe ED,41 percent had Moderate ED, and 22 percent Mild ED.
Conclusion: This study offers valuable new insights into the relationship between sexual functioning and obesity in patients.The findings highlight potential directions for future research. Considering the negative correlation between BMI and sexual functioning, further studies should explore how changes in weight impact sexual health.

Conflict of Interest: None Disclosed.

Funding: No funding to report.

PO4.418

Assessing Eating Motivations in the UK adult population: Development and Validation of the Motivations for Eating Profile (MEP-7)

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Introduction: Understanding what motivates individuals to under and overeat is essential for understanding of eating behaviour and how it affects health outcomes, obesity prevention and management. However, no single, concise questionnaire currently exists to comprehensively measure motivations for eating. The aim of the current study was to develop a questionnaire that measures 7 distinct domains of motivations for eating (MEP-7), based on a previously validated framework of eating behaviour traits, and assess its predictive validity.
Methods: In Study 1, item response theory was applied to data from an online survey of eating behaviour in 1,279 adults, alongside input from a review panel of 35 adults, to select items from widely cited and previously validated eating behaviour questionnaires. In Study 2, the selected items were measured in an online observational survey (n = 2010) using a representative sample of the UK adult population (1042 females, 968 males). The dataset was split at random with a 50/50 ratio to conduct exploratory and confirmatory factor analyses.
Results: Following a parallel analysis and exploratory factor analysis, a 7-factor model (reactive eating, restricted eating, negative emotional eating, positive emotional eating, homeostatic eating, eating for pleasure and eating for health) was deemed the best fit, supporting the 7-factor framework of eating behaviour traits. The confirmatory factor analysis confirmed the model fit (CFI = 0.993, TLI = 0.991, SRMR = 0.047, RMSEA = 0.049). All factor loadings were significant and positive (βs = 0.601 – 0.936). Reliability of the subscales were excellent: (ωT = 0.77 – 0.93). The 7-factor model significantly predicted external outcomes (ps <.05) associated with overeating and obesity, including BMI, weight change, eating rate, state hunger, physical activity, and alcohol consumption. Reactive and negative emotional eating were associated with a higher BMI, weight gain, fasting eating rate, and lower levels of physical activity. Homeostatic eating was associated with a lower BMI, slower eating rate, and more physical activity. Restricted eating and positive emotional eating was associated with a higher BMI, whereas eating for health was associated with a lower BMI. Eating for pleasure was not associated with BMI, but was associated with weight gain, and a faster eating rate.
Conclusion: The Motivation for Eating Profile (MEP-7) offers a concise and valid tool for assessing motivations for eating in adults, including people living with obesity. By profiling eating behaviour patterns, the MEP-7 can help identify individuals at risk of weight gain and guide the personalisation of pharmacological and behavioural interventions for weight management. This tool has the potential to address specific areas of the framework, supporting healthier eating habits and improving the quality of life for individuals managing obesity as a chronic condition.

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PO4.419

From Obesity to Fertility: A Systematic Review of Pharmacological and Surgical Treatments and Reproductive Outcomes

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Introduction: Obesity and overweight significantly contribute to reproductive dysfunction through hormonal, metabolic, and inflammatory pathways. While polycystic ovary syndrome (PCOS) is a common cause of infertility in individuals with obesity, fertility challenges are also observed in those without PCOS. The increasing availability of pharmacological treatments for obesity provides opportunities to evaluate their effects on reproductive health. This review examines the impact of these treatments on reproductive outcomes in individuals with obesity or overweight, with or without PCOS, compared to placebo or metformin.
Methods: A systematic review was conducted following PRISMA guidelines. A comprehensive search in PubMed using MeSH terms related to obesity, fertility, and anti-obesity medications identified studies involving individuals with overweight or obesity (with or without PCOS, excluding those with type 2 diabetes mellitus). Eligible studies assessed the effects of pharmacological treatments on fertility-related outcomes or metabolic parameters, comparing anti-obesity drugs to placebo or metformin. Studies on individuals with normal weight, animal studies, and unrelated interventions were excluded, as were articles without abstracts or those not in English. From an initial pool of 2,802 records, 636 remained after filtering for human, female participants and publications from the last five years (December 2019 to December 2024). Screening yielded 92 articles, with 28 meeting the full-text inclusion criteria.
Discussion: This review synthesized findings from 28 studies evaluating pharmacological treatments and fertility. GLP-1 receptor agonists, studied in 12 articles, improved menstrual regularity (up to 75%), ovulation rates (60%-72%), and androgen levels (15%-20%), particularly in PCOS. Metformin and orlistat, assessed in 10 studies, achieved modest weight loss (3-5 kg) and ovulation rates of 30%-52%. GLP-1 receptor agonists outperformed metformin in improving ovulation and reducing androgen levels. However, pregnancy and live birth outcomes remain underreported, underscoring a need for further trials. Tirzepatide, a dual GLP-1/GIP receptor agonist, offers a promising area for research. As of this review, no studies meeting our criteria evaluated tirzepatide's fertility effects.
Conclusion: Pharmacological treatments improve reproductive outcomes in individuals with obesity or overweight, with GLP-1 receptor agonists showing significant efficacy. The limited reporting of pregnancy and live birth outcomes highlights the need for more robust research. New therapies, like tirzepatide, warrant exploration to advance the management of obesity-related infertility.

PO4.420

Long-term effects of an 8-week, energy-restricted ketogenic diet intervention in women with overweight and obesity class I

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Introduction: The ketogenic diet (KD), characterized by high fat and low carbohydrate intake, has garnered significant attention for its potential role in managing obesity. This dietary approach induces a state of ketosis, where the body utilizes fat as its primary energy source, potentially leading to weight loss and improved metabolic health. Recent studies have highlighted the effectiveness of very-low-calorie KD in reducing body weight, improving insulin sensitivity, and lowering inflammation. However, the effects of KD with a non-extreme deficit and the long-term sustainability and safety of the ketogenic diet remain subjects of ongoing research. In this study, the long-term effects of KD applied as a weight management solution in a group of women with overweight and obesity were evaluated.
Methods: A randomized, single-centre, controlled trial was conducted with 80 adult, non-menopausal women with a BMI of 25.5-35 without any chronic diseases. The women were randomly divided to receive food catering with approximately 1750 kcal daily containing KD or a standard diet (SD), respectively. At baseline (T0), after 4 weeks (T1), and at the end of the study (T2), body composition was measured and blood samples were collected. After 1 year, a follow-up visit was performed.
Results: The first part of the study was completed by 71 women, and the data collected from 66 participants were used in the analysis (SD = 34, KD = 32). After 1 year, the results from 49 women were analysed (SD = 23, KD = 26). Directly after the nutritional intervention, similar weight loss was observed in both groups (KD avg. = 6.42 kg vs. SD avg. = 4.85 kg). After 1 year, further weight loss was achieved in only 7 (27%) and 9 (39%) in the KD and SD groups, respectively. The majority of participants regained the lost weight, when the diet was no longer delivered and controlled.
Conclusions: This study shows that although KD was slightly more effective in weight loss, the percentage of weight regain after finishing the dietary regime was higher compared to the standard diet.

Conflict of Interest: Natalia Drabińska was employed by BE KETO company to develop keto-friendly product and to write series of diet-related articles on their website. BE KETO company has no influence on the obtained results. The remaining authors have no conflicts of interest to declare.

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PO4.421

Effectiveness of Dietary Intervention and Lifestyle Modification in Controlling Body Weight in Gestational Diabetes Mellitus

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Introduction: Overweight and obesity in pregnancy increase the risk of gestational diabetes mellitus (GDM) and associated adverse outcomes. Pre-pregnancy obesity is also a major risk factor for excessive weight gain during pregnancy and for poorer glycaemic control. The aim of this comparative study was to evaluate whether an intensive lifestyle modification programme and counselling is effective in promoting adequate glycaemic compensation and weight control during pregnancy in women with overweight/obesity and GMD compared to women with normal pre-pregnancy BW.
Methods: Data from 138 women with GMD diabetes attending our specialistic outpatient clinic were collected from first visit to delivery. All patients underwent a diabetic examination and counselling every 2 weeks until delivery, during which a balanced diet and exercise programme were prescribed. At each visit, glycaemic control and dietary compliance were assessed and discussed with the patient. Data were analysed at the time of diagnosis of GDM (25 weeks' gestation -T0) and at the antenatal visit (37-38 weeks' gestation-T1).
Results: Out of 138 total women with GDM, 90 patients with normal pre-pregnancy BW (36.2±5.4 yrs, BW 58.2±6.6 Kg, BMI 21.5±1.9 Kg/m2, HbA1c 31.7±4.0 mmol/mol) and 48 patients with pre-pregnancy overweight/obesity (37.2±4.9 yrs, BW 87.3±17.8 Kg, BMI 32.2±6.2 Kg/m2, HbA1c 32.6±4.0 mmol/mol) were considered for the retrospective analysis. As expected, a significant increase in BW was observed in each of the 2 groups at T1 ($p<0.001$), but BW variation (Δ) between T0-T1 was significantly lower in women with pre-pregnancy overweight/obesity

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(+5.1±5.8 Kg) than in women with pre-pregnancy normal BW (+8.7±4.3 Kg, p=0.002). At T1, a significant increase of HbA1c was observed in women with pre-pregnancy normal BW (+0.68±4.9 mmol/mol, p=0.005) compared to T0, but not in the group of women with pre-pregnancy overweight/obesity (+0.58±2.9 mmol/mol); the difference in ΔHbA1c between the 2 groups was not significant. The two groups did not differ in the percentage of women with a positive family history of diabetes, diagnosis of hypothyroidism, PCOS, previous GDM, and medically assisted procreation.
Conclusion: The lower weight and HbA1c gains observed in our study in women with GDM and overweight/obesity may be the result of intensive lifestyle intervention, compared to the pre-pregnancy period, which probably resulted in BW loss during pregnancy and adequate glycaemic compensation, comparable to that observed in women with GDM and normal BW. Lifestyle interventions, including dietary advice, physical activity, education and self-monitoring of blood glucose, are the first-line treatment for most women diagnosed with overweight/obesity and GDM.

PO4.422

Age at menopause and development of type 2 diabetes in Korea

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Importance: There is limited evidence regarding the association between age at menopause and incident type 2 diabetes (T2D).
Objective: To investigate whether age at menopause and premature menopause are associated with T2D incidence in postmenopausal Korean women.
Design: Population-based cohort study of postmenopausal women who enrolled in 2009 with a median follow-up period of 8.4 years (interquartile range, 8.1–8.7 years). Data were analyzed in March 2024.
Setting: A nationally representative sample from the Korean National Health Insurance Service database.
Participants: 1,125,378 postmenopausal women without T2D
Exposures: Age at menopause and premature menopause (menopause onset <40 years of age)
Main Outcomes and Measures: The primary outcome was incident T2D. Multivariable Cox proportional hazards regression analysis was utilized to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) for incident T2D according to age at menopause, adjusting for potential confounders.
Results: Of 1,125,378 participants (mean [SD] age, 61.2 [8.4] years), 113,864 (10.1%) were diagnosed with T2D at least one-year post-enrollment. Women with menopause onset <40 years of age (premature menopause), between 40–44, and 45–49 had hazard ratios (HRs) for T2D of 1.13 (95% confidence interval [CI]: 1.08–1.18), 1.03 (95% CI: 1.00–1.06), and 0.99 (95% CI: 0.98–1.01), respectively, compared to those with onset at 50 years or older. These figures were adjusted for sociodemographic, lifestyle, cardiometabolic, psychiatric, and reproductive factors. A younger age at menopause was linked to an increased risk of developing T2D (P for trend <.001). Body mass index, depressive disorder, and prediabetes significantly modified the effect in subgroup analyses.
Conclusions and Relevance: In this cohort study, premature or early menopause was linked to a higher risk of T2D, highlighting the need for targeted public health strategies aimed at preventing or delaying T2D among postmenopausal women.

PO4.423

Obesity as a Risk or Aggravating Factor in the Development of Lipedema: A Systematic Review

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Introduction: Lipedema is a genetic lipodystrophic condition characterized by an abnormal increase in subcutaneous adipose tissue, predominantly in the lower body. The precise triggers for the onset or progression of symptoms remain unclear. Obesity is present in approximately 50% of patients diagnosed with lipedema. However, there is no consensus on whether obesity serves as a risk factor or an aggravating condition for lipedema.
Methods: A systematic review was conducted using PubMed, Lilacs, and Google Scholar. The PICO framework was applied, defining the population as patients with lipedema, the intervention as obesity as a risk or aggravating factor, the comparison as patients with lipedema without obesity (optional), and the outcome as the development or progression of lipedema. The search query used was:
("Obesity"[Mesh] OR obesity OR overweight) AND ("Lipedema"[Mesh] OR lipedema OR lipoedema) AND ("Risk Factors"[Mesh] OR "Disease Progression"[Mesh] OR risk OR aggravating OR progression).
Articles in English or Portuguese were included, with systematic reviews or observational studies prioritized, and publication limited to the last 10 years. Of 30 identified articles, 15 met the inclusion criteria for final analysis.
Results: Adipose tissue dysfunction in lipedema is influenced by multiple factors, including genetic and environmental contributors. Individuals with both lipedema and obesity show additional fat deposition with a gynoid distribution, increased hip circumference compared to controls, and more frequent episodes of edema. These patients are also at greater risk for chronic venous insufficiency and thrombosis. One study found that 42.2% of women with lipedema maintained a normal weight, while 51.1% were classified as obese. Another study highlighted that lipedema is associated with 42% greater lower-extremity adipose tissue deposition compared to BMI-matched women without lipedema.
Conclusion: Obesity exacerbates the severity and number of symptoms in individuals with lipedema. The volume and shape of the legs in lipedema are significantly influenced by the degree of concurrent obesity. Further research is needed to explore the direct correlation between obesity and lipedema and to establish more precise management strategies for these patients.

PO4.424

How are physical activity, sedentary behavior, and sleep related to mental health in adults with obesity?

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Introduction: Physical activity is associated with better mental health in adults from the general population. However, the findings observed in the general population do not necessarily apply to adults with obesity, and the relationships between sedentary behavior, sleep, and mental health in this population remain to be elucidated. This systematic review and meta-analysis aimed to synthetize the literature that focuses on the

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relationship physical activity, sedentary behavior, and sleep have with mental health in adults with obesity.
Methods: An electronic search of five different databases was conducted until April 2024 to identify relevant studies. To be considered, experimental and observational studies had to include adults aged over 18 years with a body mass index ≥30 kg/m2 in their sample. All selected studies focused at least on one of the components of the 24-hour movement continuum, i.e., physical activity, sedentary behaviors, or sleep. Mental health outcomes included depressive symptoms, anxiety, quality of life, eating disorders, disordered eating, body image, self-esteem, and social physical anxiety. Titles, abstracts and full texts were screened by independent reviewers, and conflicts were resolved by discussion. For experimental studies, meta-analyses were performed using continuous random effects and maximum likelihood estimation methods.
Results: In total 2256 studies were found, and this number was reduced to 1548 after removing the duplicates. After screening, 66 were retained, out of which 60 focused exclusively on the association between physical activity and mental health outcomes. Sedentary behavior and sleep were very rarely considered, with only two and five observational studies found respectively. Quality of life was assessed in 70% of the studies, followed by depressive symptoms (26%), and anxiety (12%). The vast majority of both experimental and observational studies showed a positive association between physical activity and quality of life, but this association was not confirmed by the results of the meta-analysis. A positive association, partially supported by the meta-analysis results (k=4; Hedge's g=-0.62, 95%CI [-1.28; 0.04], p=0.06), was found between physical activity and depressive symptoms. Results were sparse and inconsistent for the other mental health outcomes.
Conclusion: Although sedentary behavior and sleep are important complements to physical activity in lifestyle interventions, they are often overlooked in relation to mental health in adults with obesity. In addition, this study suggests that physical activity could be used to reduce depressive symptoms in adults with obesity, an association that has long been suggested but rarely empirically supported in this population.

PO4.425

Sleeve gastrectomy preferentially increases GDF15 plasma levels in patients with obesity but without metabolic syndrome

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Introduction: the mechanisms of action of metabolic surgery beyond the mechanical restriction remain unclear. Modifications in concentrations of hormones affecting food intake, energy expenditure, and adipose tissue modifications are usually considered. Recently, the growth differentiation factor 15 (GDF15), a hormone with anorectic action, has been hypothesized to be involved in the surgical weight loss observed after bariatric procedures. Little evidence is currently available about the effect of sleeve gastrectomy (SG) on GDF15 in human obesity. We reported data about SG on GDF15 plasma levels in a cohort of patients suffering from obesity.
Methods: We enrolled 36 Caucasian patients with III-grade or II-grade obesity who referred to our Center for the Study and Integrated Treatment of Obesity and underwent SG. Clinical parameters and anthropometric measurements were collected. Fasting glucose, fasting insulin, lipid profile, high-sensitivity C-reactive protein, interleukin 6, leptin, and GDF15 were determined.
Results: Patients were classified by the presence of metabolic syndrome (MetS). The two groups showed similar age and anthropometric data, differing for blood glucose levels at baseline, and plasma insulin and HOMA-IR index both at baseline and after SG. Interestingly, patients with MetS showed higher GDF15 plasma levels than those without MetS (1360 ± 523.3 vs 756 ± 176.3 pg/mL, p=0.002). In patients with MetS, a direct relationship was observed between blood glucose and GDF15 concentration, while in no MetS group, a relationship was observed with plasma insulin. One year after SG a significant increase in GDF15 was observed only in patients without MetS (756 ± 176.3 vs 843 ± 247 pg/mL, p=0.04), without any significant variation in patients with MetS. The correlations between GDF15 and glucose and insulin levels were lost after surgery.
Conclusion: GDF15 is a protein with anorectic action whose production is stimulated by nutritional stress, with increased plasma levels characterizing obesity, and its modulation may represent a possibile mechanism to be considered in reducing body weight. However, in patients with obesity metabolic surgery seems only partially to modulate GDF15 variations, without any correlation with the extent of body weight loss. So, GDF15 may represents an energy sensor more than a hormone involved in surgical weight loss. Further investigations are required to define the rolel of the GDF15 pathway in obesity physiopathology.

PO4.426

Vitamin A and E status in women with overweight and obesity after 8-week, energy-restricted ketogenic diet

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Introduction: The ketogenic diet (KD), known for its high fat and low carbohydrate composition, has been recently studied for its potential benefits in obesity management. This diet induces ketosis, a metabolic state where fat is used as the primary energy source, which may lead to significant weight loss and metabolic improvements. However, the impact of KD on micronutrient status, particularly fat-soluble vitamins such as vitamin A and E, remains underexplored. These vitamins are crucial for maintaining immune function, vision, and antioxidant defence, making their status an important consideration in long-term dietary interventions. The aim of this study was to investigate the effects of KD on vitamin A and E levels in women with obesity, providing insights into the nutritional adequacy and potential health implications of this popular diet.
Methods: A randomized, single-center, controlled trial involved 80 adult, non-menopausal women with a BMI between 25.5 and 35, all free from chronic diseases. The participants were randomly assigned to receive either a ketogenic diet (KD) or a standard diet (SD) through food catering, each providing approximately 1750 kcal daily. Body composition measurements and blood samples were taken at the start of the study (T0), after 4 weeks (T1), and at the study's conclusion (T2).
Results: The concentration of vitamin A decreased in both groups after 4 weeks of diet, and remained stable till the end of the study. The status of vitamin E at the baseline and at the end of the study was at the same level in both groups, however after first 4 weeks, a decrease in its concentration was observed.
Conclusions: This study shows that the serum concentration of fat-soluble vitamins decrease after weight loss in women with overweight and obesity, irrespectively on the diet composition. Vitamin E level normalize after 8 weeks, which can be related to release of vitamins stored in adipose tissue after weight loss.

Conflict of Interest: Natalia Drabińska was employed by BE KETO company to develop keto-friendly product and to write series of diet-related articles on their website. BE KETO company has no influence on the obtained results. The remaining authors have no conflicts of interest to declare.

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PO4.427

Quality of life in women with overweight and obesity after 8-week, energy-restricted ketogenic diet

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Introduction: Quality of life (QoL) assessment in individuals with obesity often focuses on physical health, psychological well-being, and social functioning. These assessments help identify the impact of obesity on daily activities, self-esteem, and overall life satisfaction. By understanding these factors, healthcare providers can tailor interventions to improve both physical and mental health outcomes for individuals with obesity. The ketogenic diet, characterised by high-fat and low-carbohydrate intake, has gained significant attention for its potential benefits in weight management and metabolic health. This study investigates the impact of an 8-week, energy-restricted ketogenic diet on the QoL among participants.
Methods: A randomised, single-centre, controlled trial involved 80 adult, non-menopausal women with a BMI between 25.5 and 35, all free from chronic diseases. The participants were randomly assigned to receive either a ketogenic diet (KD) or a standard diet (SD) through food catering, each providing approximately 1750 kcal daily. The QoL questionnaire SF-36 was completed by the participants at baseline (T0) and at the study's conclusion (T2).
Results: At baseline, good general health was described by 63% and 50% in the KD and SD groups, respectively. After the dietary intervention, good general health was reduced to 23% and 36%, respectively, in the KD and SD groups, while 53% and 61% described it as very good. Three percent of respondents described their health as excellent at baseline, and after the intervention, this number increased only in the KD group to 10%. The feeling of full energy increased in both study groups after the dietary intervention. In the KD group, the level of happiness increased after following the diet. At baseline, the majority of respondents (44%) felt happy a lot of the time, while after the intervention, the most frequent score (43%) was for feeling happy most of the time. In the SD group, the level of happiness did not change much due to the intervention. The feeling of tiredness was reduced in both study groups. Notably, the frequency of the effect of physical health or emotional state on social interactions was reduced in both groups.
Conclusions: This study showed that weight loss resulted in an increase in subjective QoL in women with overweight and obesity class I, irrespective of diet composition. Interestingly, the level of happiness increased only after following the KD.

Conflict of Interest: Natalia Drabińska was employed by BE KETO company to develop keto-friendly product and to write series of diet-related articles on their website. BE KETO company has no influence on the obtained results. The remaining authors have no conflicts of interest to declare.

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PO4.428

Gender Differences in MASLD Prevalence Based on FIB-4 Index and Metabolic Dysfunction Criteria in People with Obesity

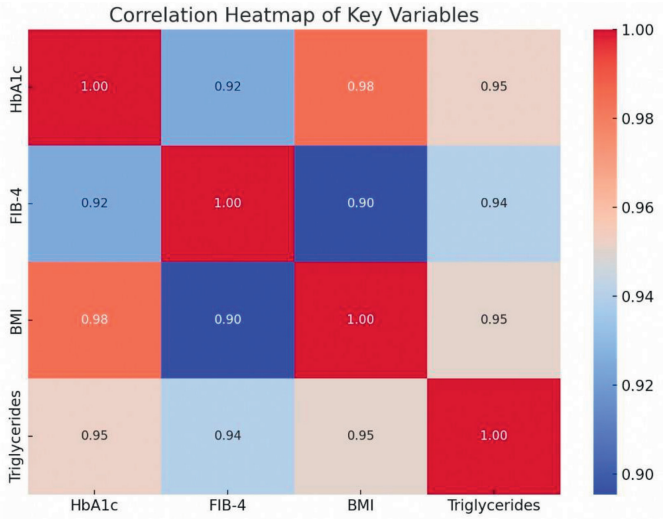
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Introduction and Study Aim: The association between obesity and metabolic dysfunction-associated steatotic liver disease (MASLD) is well-established, with MASLD affecting approximately 25% of adults globally. This prevalence exceeds 50% in individuals with type 2 diabetes, underscoring the interplay between metabolic dysfunction and liver health. Due to the impracticality of routine liver biopsy, the Fibrosis-4 (FIB-4) index provides a non-invasive means to estimate MASLD severity. This study investigates gender-specific MASLD risk factors and individual fibrosis risk in patients with obesity using the FIB-4 index.
Materials and Methods: A total of 1,398 participants with obesity (mean age: 40±12 years; 77% women) were enrolled. Baseline characteristics included mean BMI (44.4±8.8 kg/m²), HbA1c (6.0±1.2%), LDL cholesterol (118±35.4 mg/dL), triglycerides (168±89 mg/dL), and HOMA-IR (6.1±4.6). The FIB-4 index was calculated to stratify fibrosis risk into low (<1.30), intermediate (1.30–2.67), and high (>2.67) categories. Statistical analyses compared gender-specific metabolic and fibrosis risk profiles.
Results: Significant gender differences were observed in metabolic syndrome prevalence (men: 66%; women: 33%; p<0.001) and key risk markers. Men exhibited higher HbA1c value (6.6±1.5 vs. 6.0±1.0%; p<0.001), baseline weight (148.8±26.1 vs. 123.1±20 kg; p<0.001), fasting glucose (112±41 vs. 101±33 mg/dL; p<0.001), and lipid profiles (LDL: 118±38 vs. 107±33 mg/dL; triglycerides: 193±134 vs. 152±86 mg/dL; p<0.001). Diabetes prevalence was significantly higher in men (30.7% vs. 18.9%; p<0.001). Blood pressure readings also favored higher values in men.
FIB-4 analysis revealed that 18% of participants were at intermediate risk and 4% at high risk. Men in the high-risk group exhibited marginally higher FIB-4 scores (2.89±0.93 vs. 2.74±0.84; p=0.085). Elevated baseline fasting glucose and HbA1c levels were significantly associated with a FIB-4 >1.30 in both genders (p<0.001).
Conclusion: This study highlights the strong association between obesity, metabolic dysfunction, and MASLD, emphasizing the utility of the FIB-4 index in assessing liver fibrosis risk. Notable gender differences emerged, with men presenting higher metabolic risk profiles, including elevated HbA1c, fasting glucose, and lipid levels, as well as an increased prevalence of diabetes. These findings underscore the importance of gender-specific strategies in managing obesity-related MASLD and associated metabolic complications.

Conflict of Interest: None Disclosed

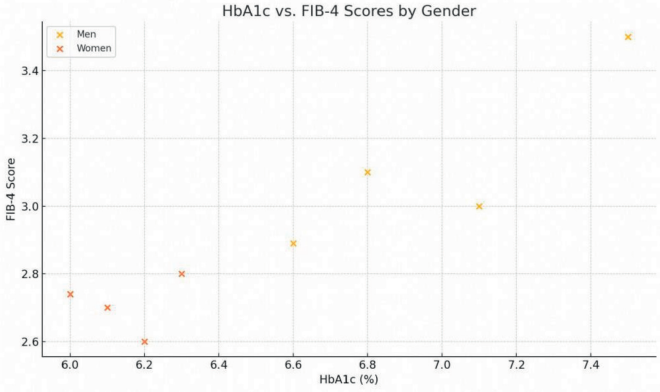
Funding: No funding to report



the heatmap displays the correlations between key variables; HbA1c, FIB-4 scores, BMI, and triglycerides. Strong positive or negative correlations are highlighted (from deep red = strong positive correlation to deep blue= strong negativ correlation)

Fig. 1. Correlation_Key variables.

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This scatter plot illustrates the relationship between HbA1c levels and FIB-4 scores.

Fig. 2. HbA1c_vs_FIB4_Gender_differences.

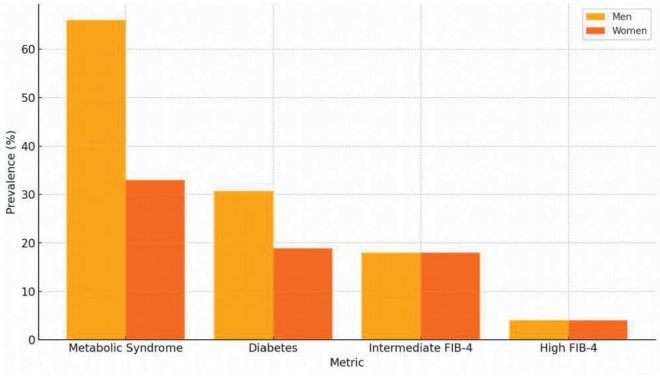


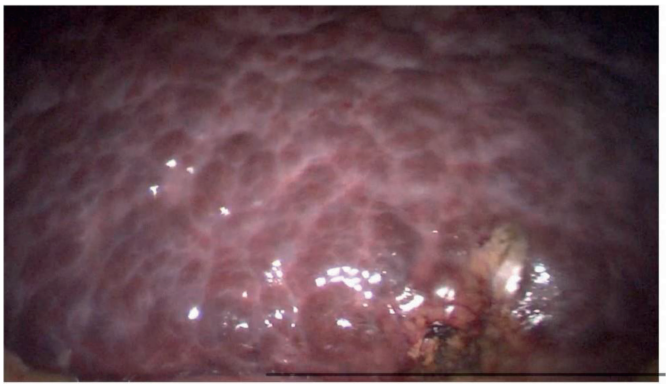
Fig. 3. Prevalence of Metabolic Syndrome, Diabetes, and FIB-4 Risk by Gender.

PO4.429

Unexpected Findings of Liver Cirrhosis in Bariatric Surgery Patients: A Retrospective Analysis of Three Clinical Cases

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Introduction: Bariatric surgery is increasingly performed in patients with obesity and metabolic comorbidities. However, the presence of undiagnosed liver cirrhosis significantly impacts surgical and therapeutic outcomes. This retrospective study describes three cases of patients who were planning to undergo SASI bypass at our medical center and were unexpectedly found to have liver cirrhosis during laparoscopy.
Methods: The study involved 3 patients with severe obesity. Preoperative evaluations included liver US, upper endoscopy, and biochemical tests, which did not indicate advanced liver disease. During laparoscopy, cirrhotic changes were discovered, which had a significant impact on the patients' further management.
Results: • Patient 1: A 49-year-old male (BMI 46.2) with type 2 diabetes, prior viral hepatitis B and C (successfully treated in 2019), thrombocytopenia (138 × 10^9/L), and no alcohol use underwent preoperative evaluation for bariatric surgery. Liver tests were normal, and upper endoscopy showed no esophageal varices. Imaging revealed hepatomegaly and a portal vein diameter of 10 mm. Laparoscopy identified cirrhosis, confirmed with biopsy results indicating micronodular monolobular cirrhosis (Child-Pugh A). LSG was not feasible due to an enlarged left liver lobe, and semaglutide was prescribed for weight loss and glycemic control.
• Patient 2: A 50-year-old female (BMI 44) underwent evaluation for bariatric surgery. The patient denied viral hepatitis and alcohol intake. Occupational exposure included contact with chemical reagents and dust (stone processing, 30 years). Liver tests were normal, Fibroscan showed F2 fibrosis, and upper endoscopy discovered no signs of portal hypertension. Intraoperative findings revealed cirrhosis, confirmed by biopsy as micronodular monolobular cirrhosis (Child-Pugh A). Laparoscopic sleeve gastrectomy (LSG) was performed, achieving safe weight loss without deterioration of liver function. One year after the operation, the patient's BMI reduced to 31, and liver elastography showed an improvement to F1 METAVIR.
• Patient 3: A 44-year-old male (BMI 43.2) with chronic Hepatitis C (genotype 3, minimal activity) was preparing for bariatric surgery. He had thrombocytopenia (114 × 10^9/L) and elevated liver enzymes (ALT 98 U/L, AST 76 U/L). US and upper endoscopy did not show any signs of liver cirrhosis. Intraoperative findings revealed cirrhosis, and liver biopsy approved micronodular cirrhosis. LSG was performed instead of SASI bypass. After antiviral therapy (Glecaprevir/Pibrentasvir 12 weeks in standard doses), no viral load was detected. One year later, his BMI decreased to 27.45 with no hepatic decompensation.
Conclusion: Undiagnosed liver cirrhosis can present unexpected challenges in bariatric surgery. Preoperative assessment should incorporate advanced diagnostic modalities, such as liver fibrosis calculators and elastography/MRI, especially in high-risk patients. Despite intraoperative findings, LSG proved to be a safe and effective procedure for weight loss and metabolic improvement in patients with compensated cirrhosis. Future studies should evaluate long-term outcomes for this population.



This is a photo of a cirrhotic liver, taken during the laparoscopy of the first patient.

Fig. 1. Laparoscopic view of cirrhotic liver.

PO4.430

Breaking Barriers: A Successful Weight Management in a Patient with Schizophrenia and Severe Psychosis

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Introduction: Schizophrenia, particularly with prominent negative symptoms, presents a significant challenge in managing comorbid conditions like severe obesity. The interplay between the psychiatric condition, antipsychotic medications, and associated lifestyle factors exacerbates the risk of metabolic syndrome, cardiovascular diseases, and reduced quality of life. Weight management in such cases requires a multidisciplinary approach, often hindered by limited patient engagement and cognitive impairments.
Methods/Case Presentation: We report the case of a 41-year-old female with long-standing untreated schizophrenia, Obesity stage -3-(BMI 42), and prominent negative symptoms. After years of untreated psychosis and progressive functional decline, the patient was admitted following

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a psychiatric crisis. Initial efforts focused on stabilizing her psychiatric condition with aripiprazole, a well-known weight gain promoting atypical-Anti psychotic medication, so her weight raised from 89 to 113 kg in less than 6 months of treatment, therefore, she was referred to our Obesity treating physicians to start her medical weight management.

Results/Course of Follow Up: Despite adherence to nutritional counseling and metformin therapy for 3 months, significant weight loss was not achieved. The introduction of liraglutide, a GLP-1 agonist, alongside dietary and lifestyle interventions, led to remarkable outcomes: a total weight loss of 21 kg (18.5% of total body weight) over 30 months, improved cardiometabolic parameters, and enhanced cognitive and behavioral engagement. (Table is available for weight loss and cardiometabolic parameters in the additional file).

Conclusion: This case underscores the efficacy of GLP-1 receptor agonists in managing patients with obesity and chronic schizophrenia, even in the presence of prominent negative symptoms. The findings highlight the need for a multidisciplinary, patient-centered approach in overcoming barriers to care and achieving significant health outcomes in complex psychiatric cases. Further studies are warranted to explore the broader applications of GLP-1 agonists in similar populations.

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Tab. 1. Baseline and post intervention weight loss and cardiometabolic parameters

Parameters	Visit-1	Visit-2	Visit-3	Visit-4
Weight (Kg)	113.5	98	93	92
BMI (Kg/M2)	42	36	33.7	33.4
EW(Kg)	43.5	28	23	22
EWL% (Excess Weight Loss %)	0	35.6	47.1	49.4
FBS (mmol/L)	4.7	-	4.5	4.3
HBA1C	5.2	4.8	4.4	4.5
T.C (mmol/L)	3.8	4	3.6	3.6
T.G (mmol/L)	1.1	1.1	0.9	0
LDL (mmol/L)	2.2	2.5	2.1	2
HDL (mmol/L)	1.1	1	1.1	1.2
Blood pressure	111/79	115/78	100/60	104/71

The table explains weight loss and cardiometabolic parameters changes throughout bariatric medicine follow-up visits. The patient had four consults with the bariatric medical physician, so first visit then follow-up visits at 8 months, 24 months, and 30 months, during each one, variables included weight loss change parameters, (Wight, BMI-Body Mass Index, EW-Excess Weight, EWL%-Excess Weight Loss %), FBS- Fasting blood sugar, HBA1C, lipid profile (TC-Total Cholesterol, TG-Triglyceride, LDL-Low Density Lipoprotein, HDL-High Density Lipoprotein, and blood pressure readings.

PO4.431

Unveiling Thiamine Deficiency in a Patient on GLP-1 Agonist Therapy for Obesity; A case report and literature review

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Background: Thiamine deficiency is a rare condition that can lead to neurological complications, especially in patients experiencing rapid weight loss or poor nutritional intake. The growing use of GLP-1 receptor agonists, such as tirzepatide, for weight reduction necessitates awareness of potential micronutrient deficiencies.

Case Presentation: A 26-year-old female with class II obesity, EOSS stage 0, initiated tirzepatide therapy for weight loss and achieved a 14 kg reduction (from 102 kg to 88 kg, 13.72% TWL) over three months. Following dose escalation to 7.5 mg, she developed nausea and vomiting. Imaging revealed gallstones and acute calculus cholecystitis, necessitating laparoscopic cholecystectomy. Symptoms persisted, and three weeks later, she presented with bilateral lower limb weakness and numbness. Laboratory tests revealed deficiencies in thiamine, vitamin A, vitamin B6, selenium, and zinc. High-dose thiamine and micronutrient supplementation led to gradual improvement. Nerve conduction studies identified sensory-motor axonal polyneuropathy. Nutritional deficiency was suspected as the primary etiology, though a full neurological evaluation was performed to rule out other causes.

Discussion: This case highlights the importance of monitoring for nutritional deficiencies in patients on GLP-1 RAs, particularly those with rapid weight loss or recent surgeries. The appetite-suppressing effects of GLP-1 RAs may increase the risk of micronutrient deficiencies, including thiamine. A review found that treatment with GLP-1 receptor agonists led to a 16–39% reduction in caloric intake, increasing the risk of micronutrient deficiencies [1]. Another review highlights the prevalence of thiamine deficiency in patients undergoing weight loss treatments like GLP-1 RAs, emphasizing the need for monitoring and supplementation to prevent neurological complications [2]. Another pharmacovigilance study found that GLP-1 receptor agonists were associated with an increased risk of nutritional adverse events, underscoring the need for proactive screening during therapy [3].

Conclusion: Physicians prescribing GLP-1 RAs for obesity management should counsel patients on multivitamin supplementation to prevent deficiencies. In cases of neurological symptoms, a full neurological assessment is required to rule out other causes and ensure timely treatment.

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PO4.432

Serum adipokins and glicemic profile association with weight regain in individuals in late post-operative of bariatric surgery

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Introduction: After bariatric surgery, some patients have difficulty maintaining lost weight, favoring weight regain. Increased weight in the form of adipose tissue can lead to an imbalance in the secretion of adipokines, such as adiponectin and leptin, and modify the glycemic profile.

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The relationship between bariatric surgery and leptin and adiponectin levels has already been reported, however there is little data in the literature on their levels after 24 months of surgery, a period in which there is a greater prevalence of weight regain and changes in the glycemic profile.
Objective: This study aimed to investigate the effect of weight regain on serum concentrations of leptin, adiponectin and glycemic profile in individuals in the late postoperative period of bariatric surgery.
Methodology: Participants who underwent bariatric surgery using the Roux-en-Y Gastric Bypass technique at least 2 and at most 7 years ago were included. Sociodemographic, anthropometric and biochemical data were collected, and body composition was measured using tetrapolar electrical bioimpedance. Weight regain rates and % excess weight loss, in addition to HOMA-IR were calculated. Serum markers were measured according laboratory kits. The project is approved by the Research Ethics Committee (CEP) of the Faculty of Health of the University of Brasília (UnB).
Results: The sample consisted of 42 individuals, 39 of whom were female (92.9%), with an average age of 38.4±7.8 years. The predominant classification of the Body Mass Index was overweight in the group without regaining weight (54.2%), and in the group with regaining weight there was a higher prevalence of overweight and obesity (33.3% and 33.3%, respectively) (p=0.018). The group with weight regain showed a lower percentage of excess weight loss than individuals who did not regain weight (p<0.001) and a higher percentage of body fat (p=0.006). Both insulin (p=0.003; r= 0.538 and p<0.001) and HOMA-IR (p=0.002; r= 0.583 and p<0.001) presented increased values in the group with weight regain and were positively correlated with weight regain. There was no difference between the groups in the adipokine analyzes.
Conclusion: Leptin and adiponectin showed no association or significant correlation with weight regain and fat percentage. Insulin and HOMA-IR were positively correlated with weight regain and fat percentage. The relationship between chronic inflammation and insulin resistance is bidirectional, so we can suggest that the individuals with weight regain studied may be in a situation where they present an inflammatory response, which can trigger recurrence of comorbidities who previously went into remission. The relationship between the adipokine profile and the glycemic profile with weight regain in individuals in the late postoperative period of bariatric surgery is a promising area for investigation, justifying the continuation of studies with a sample size compatible with the performance of more robust statistical analyzes.

PO4.433

Changes in bone turnover markers and their relationship to muscle mass during the first year after gastric sleeve surgery

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Introduction: Bariatric surgery is associated with rapid and significant changes in body composition and nutritional factors, which are accompanied by modifications in bone turnover markers, leading to negative effects on bone health. This study aimed to investigate changes in bone turnover markers and their relationship with muscle mass, represented by ASMI, at 6 and 12 months after gastric sleeve.
Methods: A total of 84 patients who underwent gastric sleeve surgery were included in this study, comprising 41 males and 43 women. The participants had a mean BMI of 42.23±5.12 kg/m², with a mean age of 40.76±10.25 years. Serum CTX-1 and osteocalcin levels were measured using electrochemiluminescence immunoassay (ECLIA), and ASMI was determined through a whole-body DXA scan.
Results: At 6 months postoperatively, significant increases in CTX-1 levels (0.252 (0.148) ng/ml vs. 0.721±0.246 ng/ml, p<0.001) and osteocalcin (10.29 (5.41) ng/ml vs. 22.21±6.91 ng/ml, p<0.001) were observed. The upward trend in osteocalcin levels continued at 12 months (26.65±8.10 ng/mL), while CTX-1 levels decreased slightly at 12 months compared to 6 months (0.637 (0.316) ng/ml), though the change was not statistically significant. The OSC/CTX-1 ratio was calculated to assess how bone formation changes in relation to bone resorption after gastric sleeve surgery. A 26% lower ratio was observed at 6 months, indicating more pronounced initial bone resorption. By 12 months, the ratio increased, approaching baseline values (a 5% variation between baseline and 12-month values, p<0.001), suggesting an uncoupling between bone formation and resorption. There were no statistically significant differences between genders regarding the OSC/CTX-1 ratio. The OSC/CTX-1 ratio at 6 months negatively correlated with the percentage change in BMI from preoperative to 6 months (r=-0.255, p<0.05) and the percentage change in ASMI over the same period (r=-0.242, p<0.05).
Conclusion: Bone turnover is elevated following gastric sleeve, with bone resorption more pronounced during the first 6 months, while bone formation peaks at 12 months. A reduction in muscle mass, as indicated by ASMI, is associated with greater bone resorption compared to bone formation at 6 months.

PO4.434

Deformation parameters of left atrium in patients with morbid obesity

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Introduction: The relationship between obesity and heart failure with preserved ejection fraction (HFpEF) is complex. Obesity imposes increased stress on the heart, resulting in dysfunction of the left atrium. In obese patients, chronic inflammation, increased preload and afterload, and pulmonary hypertension are commonly observed. The two-dimensional speckle tracking (2D ST) method, as part of the echocardiographic examination, is a significant tool for assessing dysfunction of the left atrium. The aim of our study was to compare left atrial function using the 2D ST method in patients with morbid obesity and a control group. The parameters compared included Reservoir Left Atrial Strain (R-LAS), Conduit Time (CT), and Contractile Displacement (CD).
Methods: We conducted an observational, prospective study that included 20 patients with morbid obesity (BMI > 40 kg/m²) and a control group of 19 healthy individuals with a BMI of 20–25 kg/m². Parameters were measured using transthoracic echocardiography (Vivid® E95, GE Medical Systems, Milwaukee, WI, USA) performed by a single doctor trained in echocardiography.
Results: The study cohort comprised 4 men and 16 women, with an average age of 44,5 ± 11,4 years. In the study group, the mean BMI was 44,8 ± 6,3 kg/m². The control group consisted of 9 men and 10 women. The average age was 27,2 ± 3,7 years and the average BMI in the control group was 22,6 ± 2,1 kg/m². There was a significant difference in R-LAS (29.9 ± 7.0 vs. 45.0 ± 11.7; p<0.001) and CT (-16.8 ± 5.89 vs. -29.7 ± 8.71; p<0.001) between the obese patients and the control group. No significant difference was observed in CD values (-13.2 ± 4.77 vs. -15.1 ± 6.28; p=0.305).
Conclusion: The R-LAS and CT parameters were significantly reduced in patients with morbid obesity compared to the control group.

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PO4.435

Results of a four-pillar lifestyle intervention program in desescalation of diabetes medication in patients with type 2 diabetes and overweight/obesity

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Introduction: Lifestyle improvements is a cornerstone in the management of type-2 diabetes mellitus (T2D), especially when associated with overweight/obesity. The Care for Diabetes (C4D) is a four-dimension program focused on changes in diet, exercise, sleeph health and relaxation. C4D is now being tested in several countries in Europe and our aim was to evaluate changes in some clinically meaningful variables in patients joining the program.
Materials-Methods: C4D is based in both theoretical and practical training for patients during an intensive 1.5 day stay (including the night time) with the medical team, as well as other short 2-hour meetings at month 1, 3, 4.5 and 6. We present the preliminary data from the first C4D group in Cantabria-Spain, showing some weight, blood pressure, glucose and lipid metabolism, continuous glucose monitoring (CGM), and body composition and muscle performance data as well as changes in the use of anti-hyperglycemic medications for their diabetes.
Results: Twenty patients with T2D and overweight/obesity entered the program, with a baseline BMI at the start of 30.42 ± 1.86 kg/m² and a duration of diabetes of 5.39 ± 2.55 years. One patient abandoned the study for personal reasons, and another was excluded after being diagnosed of autoimmune type-1 diabetes during the study.
After six months, we found a significant weight loss of 2.5 ± 0,4kg (p=0.014). Non-statistically significant differences were observed in waist circumference, blood pressure, fasting glucose, lipid profile, as well as in glucose management indicator (GMI), coefficient of variation (CV), and time in range (TIR) as measured by CGM.
HbA1c decreased from 6.6% to 6.3% (p=0,12).
Body composition was studied using bioimpedance analysis (BIA), and rectus femoris muscle and subcutaneous abdominal fat ultrasound (US) as well as muscle performance using dynamometry did not show significant differences along the study.
Nevertheless, during the follow-up all anti-hyperglycemic oral medication was discontinued in 3 (16,67%). In other 3 (16,67%) subjects at least one of the anti-hyperglycemic oral drugs was discontinued. The dose of the oral medication was reduced but not withdraw in other 4 (22,22%) patients. And finally, 1 (5,56%) patient managed to reduce her basal insulin dose by 75%.
Conclusions: In the C4D multidimensional health style program conducted in our region (amongst others), patients with T2D and overweight/obesity maintained a statistically significant although modest weight loss after 6 months, but with a clinically significant reduction in medication in 61.1% of them. However, these data reflect changes at 6 months. A further follow-up of these patients is necessary to test the durability of these lifestyle program on anti-hyperglycemic medications for diabetes.

PO4.436

Effects of lifestyle interventions on long-term weight maintenance 12 and 24 months after an 8-week formula-based weight loss intervention on body composition in adults with obesity - results from the LION study

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Introduction: Obesity is a multifactorial chronic disease associated with numerous health risks such as type 2 diabetes, cardiovascular disease, and certain cancers, which impose a significant burden on the healthcare system. Despite effective short-term weight reduction through lifestyle changes, long-term weight maintenance remains a major challenge that requires personalized approaches and digital support. Therefore, this study aims to investigate two diets and two digital tools on their effects on long-term weight maintenance after weight loss.
Methods: Adults (18-65 years) with a body mass index (BMI) between 30.0 and 39.9 kg/m² were recruited for the Lifestyle Intervention (LION) study (NCT04023942). Anthropometric parameters were measured by bioimpedance analysis at baseline, after an 8-week low-calorie formula diet, after a 12-month weight maintenance intervention (2x2 factorial design: low carb-app; low carb-newsletter, low fat-app; low fat-newsletter), and after a 12-month follow-up. A mixed effects ANCOVA adjusted for age, sex, and weight after weight loss was fitted to evaluate the main effect of the assigned diet or the assigned digital tool on weight change (Δ weight) after the 12-month weight maintenance phase (primary outcome). Additionally, a repeated measures ANOVA adjusted for age and sex was applied to identify the main effect of the assigned diet and digital tool and their interaction on Δ weight (secondary outcome).
Results: A total of 271 participants (mean age 45 ± 11 years, BMI 34.5 ± 2.9 kg/m², 64.2% women) were randomized to one of the intervention groups (ITT), 214 completed the weight maintenance intervention, and 183 completed the study after follow-up. Relative to baseline weight, an average Δ weight of -11.8 ± 3.5 kg was achieved after the weight loss intervention, -10.4 ± 8.4 kg after the weight maintenance intervention, and -7.0 ± 8.4 kg after follow-up. In a complete case analysis, no significant differences in Δ weight were found between the two diets (η^2=0.017, p=0.059) or the two digital tools (η^2=0.000, p=0.933) after weight maintenance. Furthermore, no significant effect of the assigned diet and assigned digital tool and their interaction was found on Δ weight [kg] over the full duration of the LION study (η^2<0.001, p=0.823).
Conclusion: There was a modest weight regain after the weight maintenance intervention and subsequent follow-up (24 months after weight loss), but on average weight was maintained in the present study. This result was independent of the dietary regimen (low carb vs. low fat) and the digital tool (newsletter vs. app) to which the participants were assigned.

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PO4.437

Prognostic Impact of Sarcopenic Obesity on Hospital Admission

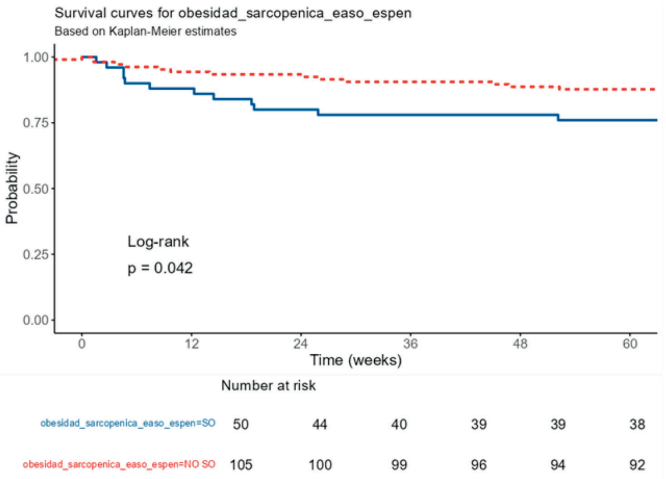
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Introduction: Sarcopenic obesity (SO) is a clinical and functional condition characterized by the coexistence of obesity, characterized by excess fat mass (FM), and sarcopenia. Due to its high prevalence, there is a need to study the impact of this condition as a risk/prognostic factor. One of the scenarios where SO has been studied the least, and there is a greater risk of sarcopenia is hospital admission. Hence the special interest in analyzing this population where obesity represents 31% of admissions. In these circumstances, there is a need to evaluate SO as a prognostic factor in accordance with the definition proposed by ESPEN-EASO.
Objectives: The main objective of this study was to evaluate whether SO according to the ESPEN-EASO criteria is an independent prognostic factor for mortality at hospital admission.
Methods: A retrospective descriptive study was carried out in 156 patients with obesity admitted to Hospital QuirónSalud Málaga (2019-2023). Obesity was defined as a high percentage of Fat Mass (FM) in accordance with EASO/ESPEN guidelines. A complete nutritional assessment was performed in these patients (MUST, Subjective Global Assessment [SGA] and GLIM criteria). Complementary to this assessment, bioelectrical impedance was measured with a phase-sensitive touch screen impedance device (Nutrilab™, Akern, Florence, Italy), working with an alternating sinusoidal electric current of 245 microampere at an operating frequency of 50 kHz (±1%). Also, handgrip strength was measured with a dynamometer (Jamar®). Data was analyzed based on the presence of obesity or sarcopenic obesity (SO) following the 2022 EASO/ESPEN criteria.
Results: Of the 156 patients with obesity (67.9% male, mean age 61.6 ± 15.1 years, mean BMI 31.140 ± 5.037 kg/m²), 32.1% of the patients met the EASO/ESPEN criteria for SO while 67.9% only had a high FM% measured by BIA according to EASO/ESPEN guidelines.

- Mean FM% was 34.7 ± 3.82% for men and 45.9% ± 3.39% for women. No statistical differences were found in terms of FM % between the group of patients with obesity and the group of patients with sarcopenic obesity.
- Survival was lower in the group of patients with SO 76% [65%-88.8%, 95% CI] vs 88% [82%-94.2%, 95% CI].
- The hazard ratio of the group of patients with obesity to the group of patients with sarcopenic obesity was 0.46 (0.22-0.99, p=0.047).

Conclusions: Our study confirms a high prevalence of patients with SO within a cohort of patients with obesity (defined as a high FM%). 32.1% of our sample met SO criteria. Patients with obesity had 54% less risk of death than patients with SO demonstrating how SO is a prognostic factor at hospital admission.



In blue patients with SO- Sarcopenic Obesity In red dotted line patients with Obesity (High FM%)

Fig. 1. Survival Plot – Group of people with Sarcopenic Obesity vs people with Obesity.

Tab. 1. Cox Table- SARCOPENIC OBESITY EASO/ESPEN CRITERIA.

Explanatory	Levels	all	HR (Univariable)
SARCOPENIC OBESITY EASO/ESPEN	SO	50 (32.1)	-
	NO SO	106 (67.9)	0.46 (0.22-0.99, p=0.047)

SO- Sarcopenic Obesity NO SO- High FM%

PO4.438

Weight loss and improvement in metabolic outcomes after 12 months from a multidisciplinary weight management program

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Aim: The aim of the study was to evaluate the impact of weight loss on changes in anthropometrics and improvement in metabolic outcomes from a multidisciplinary weight management program.
Methods: This is a cross-sectional study conducted at Genesis Healthcare Centre in Dubai, UAE. 194 patients have been evaluated from October 2022 until November 2023 as part of a multi-disciplinary weight management program. Key demographics, anthropometrics, and clinical data was analyzed using Statistical Package for Social Sciences software version 25 (SPSS Inc., Chicago, IL). Kolmogorov-Smirnov was used to test the normality of continuous variables. The Mann-Whitney test was used to compare the means between two groups if the normality was not confirmed while t-test was used for normal data per groups. A P-value of less than.05 was considered significant in all statistical analysis.
Results: 194 patients included. 152 (78.4%) females and 42 (21.6%) males. The mean age was 42 years (±8.14) with a mean BMI of 32.1 (±5.21) and 34.49 (±6.17) for females and males respectively from 44 different ethnicities.
In this cohort, the following co-morbidities were documented: 20.6% (n=40) prediabetes, 2.6% (n=5) type 2 diabetes. 5.7% (n=11) hypertension, 5.7% (n=11) obstructive sleep apnea, 66% (n=128) dyslipidemia, 21.1% (n=41) fatty liver, 10.8% (n=21) and polycystic ovarian syndrome.
Mean HbA1c was 5.4% (±0.43), AST 24.9 IU/L (±19.3), ALT 27.4 IU/L (±19.72) and GGT 25.9 IU/L (±18.8). Mean TC 213.3 mg/dl (±41.09), TG

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141.4 mg/dl (±81.3), LDL 131.2 mg/dl (±37.75) and HDL 55.70 mg/dl (±14.4). There was no statistical difference between males and females.
There was a mean 14.95% weight loss in 12 months. At baseline 4 patients were on metformin which was discontinued at 12 months. 11 patients were on 1-2 antihypertensive medications and only 2 needed to continue with 1 antihypertensive medication at 12 months. 14 patients were on statins and 10 of them discontinued statins at 12 months. 9 patients were on CPAP for obstructive sleep apnea and only 1 needed to continue with CPAP treatment at 12 months.
Conclusion: The risk of pre-diabetes, hypertension, dyslipidemia, fatty liver, obstructive sleep apnea and polycystic ovarian syndrome increased significantly with increasing BMI, highlighting the importance of preventing further weight gain even in individuals who are already living with obesity. Patients had average weight loss of 14.95% with significant education in BMI, fat mass and visceral fat (P<0.01) and it showed significant improvement in glycaemic control, reduction in LDL and improvement in HDL. (P<0.01)

Tab. 1. Anthropometrics at Baseline and at 12 months.

n=194	At Baseline	At 12 months	P value
Weight (kg)	91.4 (± 19.9)	78.46 (± 16.5)	≤ 0.01
BMI (kg/m2): Mean (±SD)	32.6 (±5.5)	27.69 (±4.7)	≤ 0.01
Waist circumference (cm)	99.91 (±10.2)	85.97 (±10.03)	0.25
Waist: Height ratio	1.66 (±0.19)	1.95 (±0.19)	0.78
Total weight loss (kg)		14.07 (±9.49)	≤ 0.01
Total weight loss (%)		14.95 (±8.53)	≤ 0.01
Fat percent	42.2% (±6.9)	35.89 (±8.06)	0.006
Fat mass (kg)	39.1 (±11.6)	28.46 (±10.44)	≤ 0.01
Visceral Fat level	17.1 (±2.9)	12.65 (±4.5)	≤ 0.01
Skeletal Muscle Mass (kg)	29.22 (±7.9)	27.86 (±8.03)	0.91

Tab. 2. Laboratory investigations at Baseline and at 12 months.

	At Baseline	At 12 months	P value
HbA1c%	5.38(±0.43)	4.9(±0.31)	0.01
Total cholesterol mg/dl	213.3 (±41.09)	191.3 (± 30.6)	0.71
Triglycerides mg/dl	141.43 (±81.3)	104.5 (±50.24)	0.98
LDL mg/dl	131.2 (±37.7)	114.04 (±29.99)	0.01
HDL mg/dl	55.7 (±14.4)	56.72 (±13.43)	0.013
AST U/L	24.9 (±19.3)	21.4 (±6.3)	0.32
ALT U/L	27.4 (±19.72)	20.2 (±11.02)	0.56
GGT U/L	25.98 (±18.82)	22.25 (± 21.2)	0.24

PO4.439

Consumption of dairy products with high/low lactose content in relation to semen quality, anthropometric and biochemical parameters in men attending an infertility treatment clinic

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Background: Obesity, type 2 diabetes, hyperglycemia and insulin resistance disrupt reproductive potential and negatively affect semen parameters, including concentration, motility, viability, metabolic and antropometric parameters. Understanding the most beneficial diet type and composition is critical to sustainable management strategies to support therapies in this population.

Aim: Milk and dairy products have been considered as an important component of healthy and balanced diet for many years. Data on milk consumption in relation to male infertility are controversial, therefore we assessed the consumption of high and low-lactose dairy products in relation to semen and anthropometric parameters in the population of male patients attending of an infertility treatment clinic.
Methods: This cross-sectional study was carried out in 91 men aged 20–35 years from Poland. The inclusion criterion for the study was the lack of lactose intolerance. Semen parameters were assessed via computer-aided semen. Diet was assessed by a food frequency questionnaire (FFQ). Dairy products are divided into those with low and high lactose content. Classical anthropometric parameters and the body composition analysis results measured by bioelectrical impedance were used to characterise nutritional status.
Results: The mean age of the participants was 30.1 (5.7) years. BMI and relative fat mass value was 27.6 kg/m2 and 24.3%, respectively. Hight -lactose dairy intake is significantly negatively correlated with glucose levels (-0.350, p<0.05), indicating that consumption may be associated with lower blood glucose. High/low-lactose dairy product intake has no significant correlation with lipid profile, body composition and semen quality parameters.
Conclusion: The results highlight the need to study whether modifications in diet improve semen quality metabolic and antropometric parameters.Therefore, it is necessary to conduct well-designed extensive research in men to lead to the final conclusion as to whether cow milk product o low/hight lactose level consumption is beneficial in their case and which products should be selected in diet.

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PO4.440

Impact of caloric and metabolic surgery interventions on plasma levels of bile acids in humans with different degrees of obesity and insulin resistance

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Introduction: Obesity and insulin resistance are linked to altered circulating bile acid levels. Bile acids, produced in the liver and modified by the gut microbiota, regulate glucose metabolism by influencing GLP-1 release. This study examines the impact of caloric and metabolic

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surgeries on fasting and postprandial bile acid and GLP-1 levels in individuals with varying obesity and insulin resistance levels. We also explore whether changes in bile acid levels are associated with improvements in glucose metabolism and specific gut microbiota signatures following interventions.

Methods: Concentrations of 16 bile acid species were quantified using targeted liquid chromatography-mass spectrometry (LC-MS/MS) before and after 30, 60, and 120 minutes of a mixed meal tolerance test. Cardiometabolic risk factors, GLP-1 levels, and fecal microbiota composition (via 16S rRNA gene sequencing) were assessed before (n=103) and after 6 months of caloric restriction in obese individuals (n=34); vertical sleeve gastrectomy (VSG) in individuals with severe obesity (n=18); and Roux-en-Y gastric bypass (RYGB) surgery in individuals with severe obesity and type 2 diabetes (T2D) (n=17).

Results: In individuals with severe obesity and T2D, fasting levels of total, primary, and secondary bile acids were significantly higher compared to those with obesity or severe obesity. These differences were attributed to conjugated bile acids, with no significant differences in unconjugated bile acids. Fasting bile acid levels positively correlated with higher glucose, insulin, and GLP-1 levels. Postprandially, individuals with severe obesity and T2D exhibited a reduced postprandial bile acid response compared to those with obesity or severe obesity. A greater postprandial bile acid response was linked to lower glucose levels and higher insulin and GLP-1 levels during the postprandial period. All interventions resulted in clinically relevant weight loss. However, caloric restriction did not modify plasma bile acid levels in individuals with obesity. In contrast, VSG increased the postprandial response of total and secondary bile acids in individuals with severe obesity. The increase in the postprandial response of HDCA was positively associated with increased GLP-1 levels. In individuals with severe obesity and T2D, RYGB increased fasting levels of total and primary bile acids but did not affect the postprandial bile acid response. The increase in TDCA levels was associated with a reduction in insulin levels. Notably, changes in bile acid profiles were linked to alterations in gut microbiota composition, with these changes being specific to the type of metabolic surgery.

Conclusion: Fasting and postprandial bile acid levels are associated with the degree of obesity, insulin resistance, and GLP-1 levels. VSG and RYGB metabolic surgeries, but not caloric restriction, differentially impact bile acid levels. Some of these changes in plasma bile acid levels are linked to improvements in glucose metabolism and gut microbiota composition.

Conflict of Interest: None.

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PO4.441

Prevalence of Prediabetes In Patients Suffering From Obesity

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Introduction: Obesity is a systemic disease that is on the rise worldwide, with serious health, psychological and social repercussions (1). Prediabetes is a state of dysglycemia preceding diabetes, defined by the ADA as a fasting blood glucose level between 1 g/l and 1.25 g/l or an A1C between 5.7% and 6.4% or a 2h after 75 g OGTT level between 1.40 g/l and 1.99 g/l (2).

The association between prediabetes and obesity is a frequent clinical situation, often forming part of the metabolic syndrome (MetS).

The aim of this study is to evaluate the prevalence of prediabetes in patients with obesity (OB) in our context.

Materials-Methods: Data collection was based on physical files and our department's computerized medical data system. Using a retrospective descriptive study over a period of 24 months). Inclusion criteria: patients with obesity and fasting plasma glucose or A1C measurement.

Results: The total number of our patients was 112, the average age of our patients was 49,16 ± 13,3 years. The sex ratio was 0,03 (108 W/ 04 M). BMI was between (31,1 and 60,5 kg/m2) with an average of 41,64 kg/m2. Morbid obesity accounted for 57.14%, severe obesity for 25,89% and moderate obesity for 16,96%.

Pevalence of prediabetes represented 22,32 % with an average fasting blood glucose level of 1,10 g/l and an average of AIC of 6,07 %.

Forty-six percent (46%) of our patients are suffering from diabetes with an average of age of diabetes by 7,8 years ± 6,61 years. Patients with metabolic syndrome (MetS) represente 46,0 %.

Prevalence of prediabetes according to class of obesity is 76% for morbid obesity, 20 % for severe obesity and 4% for moderate obesity.

Discussion and Conclusion: It has been proven the existence of an association between obesity and dysglycemic conditions such prediabetes. Obesity constitutes a situation of chronic energy excess; in fact, the accumulation of triglycerides leads to hypertrophy of adipocytes with secretion of monocyte chemotactic proteins (MCP1) which recruit macrophages with production of pro-inflammatory cytokines such as TNF alfa, resulting in leptin resistance in the muscles, an increase in interleukin 6 and resistin, responsible for inhibition of the insulin signalling pathway, leading to insulin resistance: main mechanism in the onset of prediabetes. In our study, the prevalence of prediabetes was found to be 22.32%, with a predominance in patients suffering from morbid obesity, suggesting a correlation between the severity of obesity and the prevalence of prediabetes.

PO4.442

Psychosocial factors predicting the preference for bariatric surgery: A comparison of groups differentiated by weight loss attempts

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Introduction: Bariatric surgery is widely recognized as the most effective treatment for obesity. However, critical psychosocial risks, such as increased substance use and suicidal tendencies following surgery, have garnered significant attention. These risks are thought to be influenced more by pre-existing psychological characteristics than the surgery itself. Yet, studies on this topic have yielded inconsistent findings (Fischer et al., 2017; Gaudrat et al., 2021). This inconsistency may stem from overlooking psychological variability within the non-surgical obesity population. The current study addresses this by dividing the non-surgical group into two subgroups: those actively attempting weight loss and those not making such efforts. The study compares bariatric surgery candidates, non-surgical individuals pursuing weight loss, and those not attempting weight loss based on psychosocial factors.

Key areas of focus include obesity-related quality of life, body image perception and satisfaction, eating attitudes, weight loss self-efficacy, emotion regulation, and depressive symptoms. This research aims to provide a nuanced understanding of the psychosocial factors linked to obesity and bariatric surgery.

Methods: Participants are male and female volunteers aged 18 to 50 years, recruited via convenience sampling from individuals attending the bariatric surgery clinic, dietetics and nutrition unit of a public hospital in Turkey, as well as hospital staff and patient relatives.

The study population comprises three groups: (1) 100 bariatric surgery candidates with confirmed surgery approval and scheduled dates; (2) 100 individuals actively engaged in weight loss within the past month, either by regularly consulting a dietitian or by following a structured approach on their own (such as dieting or exercising); and (3) 100 individuals with no weight loss attempts or intentions in the same period.

To differentiate these groups, validated tools such as the Moorehead-Ardelt II Quality of Life Questionnaire (MA-II), Body Esteem Scale, Three-Factor Eating Scale-R21, Multidimensional Experiential Avoidance Questionnaire-30, CES-D Depression Scale, and Weight Management and Exercise Self-Efficacy Scale are used. Logistic regression analysis will evaluate the extent to which psychosocial risk factors predict group membership.

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Results and Conclusion: Data collection is ongoing. Preliminary findings are expected to offer valuable insights into the psychosocial profiles of individuals with obesity, enabling targeted interventions to enhance outcomes, particularly for bariatric surgery candidates.

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PO4.443

Emotional Eating Interventions for Adults Living With Overweight and Obesity: A Systematic Review and Meta-Analysis of Behaviour Change Techniques

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Background: Emotional eating (EE) is a barrier to the long-term success of weight loss interventions. Up to 58% of adults referred to weight management services may struggle with EE, highlighting the need for targeted interventions. A review by Smith et al. (2023) found significant, albeit small reductions in weight (-1.08%) and EE scores (-2.37%) following psychological interventions. Subgroup analysis found Cognitive Behavioural Therapy (CBT) was the most effective, reducing EE by 38%, followed by acceptance-based interventions at 25%. However, the specific Behaviour Change Techniques (BCTs) contributing to these outcomes are unclear. This review updates and extends Smith et al. (2023) by identifying the key BCTs associated with reductions in weight and EE.
Methods: Searches of CINAHL, PsycINFO, MEDLINE, and EMBASE were conducted between January 2022 and April 2023 identifying 13 additional studies. Population: Adults of any gender, from any country, with a BMI >25kg/m^2; Intervention: Psychological interventions targeting EE; Comparator: Not limited to studies with comparator; Outcomes: Changes in weight (kg) and EE scores (measured by validated questionnaires); Study Design: randomised controlled trials (RCTs) and quasi-experimental designs. Paper screening, BCT extraction/ coding, and risk of bias assessments were conducted using the Template for Intervention Description and Replication (TIDieR) checklist, Behaviour Change Taxonomy v1 (BCTTv1), and Risk of Bias 2 (RoB2) for RCTs or ROBINS-I for non-randomised studies. A narrative synthesis was performed, and random-effects multi-level meta-analyses were conducted.
Results: A total of 47 studies, including 6,729 participants, were analysed in this update. Of the participants, 80.3% were female, average age of 45.8 years (SD 9.4). 88.6% of participants were from white or unknown ethnicity. Mean intervention duration was 17 weeks (SD 19). Most interventions (n=35, 74.5%) were group-based and delivered in person. Forty-two studies contributed to the pooled effect on EE, showing a significant reduction (SMD = -0.99, 95% CI: -0.73 to -1.25, p <.001). Thirty-two studies contributed to the pooled effect on weight, with an average reduction of 4.09 kg (95% CI: -2.76 to -5.43 kg, p <.001). The analysis identified five BCTs- related to identity, values, and self-regulation- that were associated with significant reductions in both outcomes: 'incompatible beliefs', 'goal setting outcome', 'review outcome goals', 'feedback on behaviour', and 'pros/cons'.
Discussion: BCTs focusing on identity (e.g., 'incompatible beliefs') and self-regulation (e.g. 'goal setting outcome') were associated with reductions in weight and EE. While this review provides novel insights, a GRADE assessment revealed low overall certainty in the evidence due to high heterogeneity.
Conclusion: The review highlights the need for further implementation and evaluation of the highlighted BCTs using high-quality RCT design which include long-term follow-up.

PO4.444

Prevalence and Predictors of Metabolic dysfunction-associated steatotic liver disease in a Cohort of Patients with Obesity: A Phenotypic Approach

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Introduction: Metabolic dysfunction-associated steatotic liver disease (MAFLD) is a leading cause of chronic liver disease worldwide, strongly associated with obesity and metabolic syndrome. This study aims to identify clinical and biochemical predictors of MAFLD in a cohort of individuals with obesity, focusing on the relationships between metabolic risk factors, liver dysfunction, and disease severity. We propose a phenotypic approach to guide early detection, risk stratification, and personalized management of MAFLD in populations with metabolic dysfunction.
Methods: This cross-sectional study included 712 patients with obesity attending endocrinology clinics in Madrid. Participants underwent comprehensive phenotyping, including anthropometric measurements, metabolic profiling, liver ultrasound, and fibrosis risk assessment using FIB-4 and NAFLD fibrosis score (NFS). Lifestyle factors, such as adherence to the Mediterranean diet and physical activity levels, were evaluated using validated questionnaires. Data were analyzed using logistic regression to identify predictors of NAFLD and advanced fibrosis.
Results: The prevalence of MAFLD was 52.2%, with patients aged ≥50 years showing a significantly higher prevalence (53.1% vs. 46.9%, p=0.02). Metabolic syndrome was strongly associated with MAFLD (62.5% vs. 49.6%, p=0.0058). Univariate analysis identified age, waist circumference, BMI, fasting glucose, triglycerides, HDL cholesterol, and gamma-glutamyl transferase (GGT) as significant predictors of MAFLD. In multivariate analysis, age remained the only independent predictor (OR=1.03, p=0.021). Fibrosis risk stratification revealed that 5-7% of patients were at high risk for advanced fibrosis, while 10-15% fell into the indeterminate-risk category. No significant associations were found between MAFLD and Mediterranean diet adherence or physical activity levels.
Conclusion: Age, metabolic syndrome, and dyslipidemia are key predictors of NAFLD in patients with obesity. Fibrosis risk stratification tools like FIB-4 and NFS are valuable for identifying patients at risk of advanced liver disease, even in low-risk populations. These findings underscore the importance of early identification and management of metabolic risk factors in NAFLD. Future research should explore the integration of advanced biomarkers and longitudinal studies to better understand MAFLD progression and outcomes.

PO4.445

The Evolving Role of GLP-1 Receptor Agonists in the Treatment of Dumping Syndrome: A Center's Experience

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Introduction: Dumping syndrome (DS) and post-bariatric hypoglycemia (PBH) are common complications after bariatric surgery due to altered gastrointestinal anatomy. Rapid food transit causes osmotic fluid shifts and neurohormonal changes, leading to hypoglycemia, hypotension, nausea, palpitations, diarrhea, and syncope 1.Treatment options are limited, with insufficient evidence supporting glucagon-like peptide-1 receptor agonists (GLP-1RA) or gastric inhibitory peptide (GIP)/GLP1) in treating DS/PBH.

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Results: Data from eight patients treated with GLP-1RAs for weight regain post-bariatric surgery were analyzed. The majority were females (75%) with a mean age of 45.5 years. Surgeries included primary laparoscopic sleeve gastrectomy (LSG, 37.5%) and revisional procedures (62.5%) like Roux-en-Y gastric bypass (RYGB) and one-anastomosis gastric bypass (OAGB). DS/PBH onset occurred an average of four years post-surgery. Mixed early and late dumping symptoms were present in 50%, late symptoms in 37.5%, and early symptoms in 12.5%. Diagnosis was clinical in 62.5% of cases, supplemented by gastric emptying studies for others. One patient was on acarbose, and two received monthly octreotide injections. Pre-treatment weight averaged 99.91 kg, reducing to 98.14 kg after GLP-1RA therapy. Four patients were on Semaglutide, two patients were on Tirzepatide, and two were on Liraglutide. Symptom resolution was reported by 37.5%, and 50% saw significant symptom reduction. One patient (12.5%) experienced symptoms worsening, requiring hospitalization and discontinuation of liraglutide.
Discussion: Our findings support the emerging role of GLP-1RAs and GIP/GLP-1-therapies in the management of post-bariatric surgery patients with the dual challenges of weight regain complicated by DS/PBH. 2
While DS is more common after LRYGB than LSG, no significant difference in late dumping prevalence was found between the two procedures 3. The report showed that 50% of patients experienced mixed symptoms of both early and late DS. Additionally, 87.5% of patients reported significant improvement after using GLP-1RAs or GIP/GLP-1 medications for weight loss. Despite concerns about GLP-1RAs potentially increasing insulin secretion, evidence suggests they can help reduce hypoglycemic episodes by modulating the GLP-1 response after bariatric surgery 3.

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PO4.446

Calf circumference as an anthropometric predictor of obesity in patients living with type 2 diabetes mellitus

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Obesity: is a multifactorial chronic disease that significantly affects public health, especially in patients living with type 2 diabetes mellitus (DM2). This study evaluated calf circumference (CC) as a practical and accessible anthropometric parameter to predict obesity in 464 patients with DM2, aged 18 to 80 years, treated in a hospital in Lambayeque, Peru.
An observational, cross-sectional and correlational design was used. The results showed a high correlation between CC and BMI ($r = 0.659$, $p < 0.01$) and between CC and fat mass ($r = 0.365$, $p < 0.01$). In addition, an area under the ROC curve of 0.873 for BMI and 0.756 for fat mass was obtained, with a sensitivity of 89% and specificity of 73% for BMI, and a sensitivity of 60% and specificity of 78% for fat mass. This study supports the use of WC as a useful anthropometric method in the diagnosis of obesity, especially in settings with limited resources.
Introduction: Obesity represents a significant public health problem at a global level. In patients with DM2, accurate assessment of obesity is crucial due to its association with metabolic and cardiovascular complications. This study proposes WC as a reliable and accessible anthropometric parameter to predict obesity, particularly in settings with limited resources. Body composition was also evaluated, exploring its relationship with fat and muscle mass.
Methods: An observational, cross-sectional and correlational study was conducted in 464 patients with DM2 in Lambayeque, Peru. The population included both sexes, between 18 and 80 years, with an average age of 57.93 ± 11.49 years. The mean weight of the participants was 66.45 ± 13.40 kg. Patients were selected by convenience based on inclusion criteria that required a previous diagnosis of DM2 and availability to participate in anthropometric and body composition measurements. Variables such as WC, BMI and body composition were measured by bioimpedance. Statistical analysis included Pearson correlations and ROC curves to evaluate the predictive capacity of WC versus BMI, fat mass and muscle mass.
Results: The results showed that WC has a high correlation with BMI ($r = 0.659$, $p < 0.01$) and a significant correlation with fat mass ($r = 0.365$, $p < 0.01$) and muscle mass ($r = -0.282$, $p < 0.01$). An area under the ROC curve of 0.873 was obtained for BMI and 0.756 for fat mass.
The cut-off point of ≥ 34.5 cm for WC showed a sensitivity of 89% and specificity of 73% for BMI, while for fat mass, the sensitivity was 60% and specificity 78%.
Conclusion: WC is a reliable and practical anthropometric marker to identify obesity in patients with T2DM. Its significant correlation with BMI and bioimpedance results, together with a good performance in ROC curves, validate its clinical utility. This approach can complement the traditional use of BMI, providing an accessible and effective tool to improve the detection and management of obesity.

Tab. 1. Characteristics of the general and anthropometric data of DM2 patients.

Variables	Media	DE
Age (years)	57.93	11.49
Weight (Kg)	66.48	13.4
Calf Circumference	34.72	3.82
Fat Mass (%)	40.66	10.32
Muscular Mass (%)	27.52	61.10
BMI (Kg/m2)	28.56	5.38

The population included both sexes, between 18 and 80 years, with an average age of 57.93 ± 11.49 years. The mean weight of the participants was 66.45 ± 13.40 kg.

Tab. 2. Correlation of variables with calf circumference.

Variables	Age	Weight	Size	Fatty Mass	Muscle Mass	BMI
Circumference of calf	-,210	,719	,206	,365	-,282	,659

The results showed that WC has a high correlation with BMI ($r = 0.659$, $p < 0.01$) and a significant correlation with fat mass ($r = 0.365$, $p < 0.01$) and muscle mass ($r = -0.282$, $p < 0.01$).

PO4.447

Impact of pregnancy weight gain in women living with overweight or obesity on long-term maternal and child health outcomes

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Introduction: With the obesity pandemic, pregnancy in women with overweight and obesity have increased. Obesity impacts both maternal and fetal outcomes, highlighting the importance of healthy weight gain. However, data on healthy weight gain during pregnancy in women living with overweight and, especially obesity remain limited, often applying

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uniform recommendations across all obesity classes. This study aims to evaluate the long-term impact of pregnancy weight gain in women with overweight or obesity on maternal and offspring weight after 4–6 years of follow-up.
Methods: Women with prior overweight or obesity treated for gestational diabetes at our clinic from January 2018 to December 2019, and their offspring, were eligible to participate. Women with twin pregnancies and those who conceived through medically assisted reproduction techniques were excluded. Children's anthropometric data were obtained from electronic health records, while maternal weight was self-reported. Of 160 eligible women, 147 were contacted; 3 declined participation, and 49 did not complete informed consent.
Results: A total of 95 women were included in the study and they were divided into three groups: recommended weight gain (RWG) (n=27), below recommended weight gain (BRWG) (n=37), and above recommended weight gain (ARWG) (n=31). The maternal mean age was 33.8 ± 5.4 years, with no significant differences between groups. Median pre-pregnancy weight (kg) and BMI tended to be higher in the ARWG group, though no significant differences were observed. Mean weight gain was 3.1 ± 2.5 kg in the BRWG group compared to 14.5 ± 3.2 kg in the ARWG group. No differences were observed in maternal obstetric outcomes, but newborns in the ARWG group had a significantly higher birth weight z-score compared to those in the RWG and BRWG groups (p=0,08). Median current maternal and children's weight or BMI have no significant differences between groups. When comparing women's pre-pregnancy and current weight, there is no significant difference found either.
Conclusions: In this study, pregnancy weight gain among women with overweight or obesity does not influence offspring's weight at 4-6 years of follow up. Regarding maternal weight, although weight gain within or below the expected range during pregnancy might suggest that our interventions could have long-term effects, including future weight loss, we found that a time-limited intervention had no lasting impact. This highlights that obesity is a chronic condition requiring structured, long-term follow-up to sustain the benefits of nutritional and physical activity counseling.

PO4.448

Functional foods with cocoa and bitters influence the acute response of gastrointestinal hormones involved in hunger regulation

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Introduction: The modulation of bitter taste is gaining attention as a potential strategy to regulate caloric intake by influencing eating behaviour and gastrointestinal hormones such as ghrelin, GLP-1, and PYY.
Methods: Eleven healthy, normal-weight subjects (age: 26.6 ± 2.4 years; BMI: 21.9 ± 2.4 kg/m^2) participated in four separate sessions involving: two OGTTs with 50 g of glucose, and two mixed meal tests with 85 g of biscuits (50 g of carbohydrates) containing cocoa (CB) or bitters micro-encapsulated from Artemisia absinthium extract (16%) (BCB). The biscuits administration was double-blinded. Evaluations included glycemic index (GI), hormonal responses (GLP-1, PYY, acylated ghrelin [AG], and unacylated ghrelin [UAG]), food craving assessment via the "Control of Eating Questionnaire," and post-consumption satisfaction analysis.
Results: The GI of CB was 37.4 ± 34.1, and for BCB, it was 29.2 ± 24.6. A greater increase in PYY and AG levels was observed at T45, T60, and T120, alongside a more pronounced reduction in GLP-1 at T60 and T90, after both CB and BCB compared to OGTT. Moreover, PYY levels were significantly higher at T45, T60, and T120 following BCB intake compared to CB. No differences were observed between CB and BCB for the other hormones. Satiety before dinner was higher on the day BCB was administered, while no changes were observed after CB or OGTT ($p<0.05$).
Conclusions: Dark cocoa and micro-encapsulated bitter compounds suggest an ability to modulate the response of gastrointestinal peptides involved in hunger regulation. Their strategic use may offer a promising approach to support obesity management.

PO4.449

Collaborative Care in Obesity Management at the National Bariatric Center: Insights from Qatar's First EASO-Accredited Center of Excellence

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Introduction: Obesity is a complex disease associated with disability and requires lifelong intervention1. The best approach for managing obesity is the multidisciplinary care combining dieticians, physiotherapists, bariatric physicians, surgeons and allied health professionals. The National Bariatric Center (NBC) in Qatar is a premier example of multidisciplinary efforts. This article highlights services provided by the NBC as the first EASO- accredited obesity management center in Qatar.
Methods: We reviewed the literature using Pubmed to explore the multidisciplinary approach in obesity management worldwide. We highlight the multidisciplinary model at the National Bariatric Center (NBC) at Hamad Medical Corporation in Qatar.
Results: Evidence supports the integration of multidisciplinary approaches in managing obesity2. The NBC at HMC unifies bariatric medicine, surgery, dieticians, physiotherapists, and nursing educators in creating tailored patient care. It handles around 10,000 patient visits annually, 40% of which are new patients. Patients undergo comprehensive assessment with medical history, examination, and psychological screening. They are then channeled to either medical or surgical treatment pathways.
Non- Surgical patients receive lifestyle and behavioral interventions with pharmacological therapy and are managed by the bariatric medicine team. Surgical patients are referred to the bariatric surgery clinic, where they receive a full assessment for surgery. Surgical options include sleeve gastrectomy (70%) and gastric bypass (20%). About 1000 patients undergo bariatric surgery annually at the NBC.
The bariatric medicine team is crucial to surgical patients. Patients who have a medical history of chronic disease (such as diabetes mellitus, hypertension) are seen in the Bariatric Medicine Optimization Clinic, a weekly clinic aiming to control obesity- related comorbidities. The team facilitates coordination with other subspecialties to provide pre-operative assessment and clearance. Patients are followed by the bariatric medicine team during hospital admission ensuring minimal peri-operative complications. After surgery, patients are followed in medicine and surgery clinics for periodic nutritional assessment and optimal weight outcome. This comprehensive care resulted in a decrease in surgical complications, such as leaks and bleeding, at our center compared with international rates.
We also looked at favorable outcome indicators. Surgical patients achieve an average of 18% TWL at 6 months and 30% at 24 months. Non- surgical patients show around 20% TWL at 24 months. Patients achieve 75% resolution/ improvement in diabetes, 65% in hypertension and 50% in OSA. Quality of life scores improve from 50/100 to 85/100 at 12 months. 70% of the patients are very satisfied with our service, 20% report being satisfied, and 5% are neutral.
The NBC is an active member of the Metabolic and Bariatric Surgery Accreditation And Quality Improvement Program (MBSAQIP) data registry since 2021.
Conclusion: Multidisciplinary care is the best approach for managing obesity. The NBC at HMC in Qatar is a successful example of this model.

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PO4.450

Response to SGLT2 Inhibitors and GLP-1 Receptor Agonists in People with Type 2 Diabetes and Obesity: Age and Sex Differences

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Introduction: Sex and age differences are important determinants of health and, as such, are relevant to personalised approaches to patient care. They may influence the pathophysiology of type 2 diabetes (T2DM) complications, as well as the pharmacodynamics and pharmacokinetics of drugs used to treat T2DM. We hypothesised that the new classes of glucose-lowering drugs (SGLT2 inhibitors and GLP-1 receptor agonists) may have different efficacy in men and women, and in young and older people. The aim of this real-world, retrospective, comparative study was to assess potential sex- and age-related differences in body weight (BW) loss and glycated haemoglobin (HbA1c variation) in people with obesity and T2DM treated with SGLT2i or GLP1-RA.

Methods: Data were collected from 146 people with obesity and T2DM attending our outpatient diabetes clinic and starting treatment with SGLT2i (empagliflozin, dapagliflozin or canagliflozin) or GLP1-RA (semaglutide). Participants over 70 years of age were considered older. Data on weight, BMI and HbA1c were analysed at baseline (T0), 6 months (T1) and 12 months (T2) after the start of the intervention with SGLT2i or GLP1-RA.

Results: Analysing the data by age, in the group of participants treated with GLP1-RA, there were no significant differences in the change in BMI (T0-T2) between patients aged ≥70 years and patients aged <70 years (respectively, ΔBMI -1.33±1.75 vs -2.06±2.22, p=0.12). In both subgroups, the change in BMI was significantly greater in the first six months of treatment (T0-T1) than in the second six months (T1-T2). In the SGLT2i group, the change in BMI (T0-T2) was significantly higher in patients aged ≥70 years than in patients aged <70 years (-1.44±1.3 vs -0.68±1.5, p<0.01); this difference was most evident between T1-T2 (-1.44±1.3 vs -0.68±1.5, p<0.01). Treatment with GLP-1 was more effective in reducing HbA1c in people aged <70 years than in those aged >70 years (-6.38±9.72 vs -2.23±8.59, p=0.07), but only in the first half of the year.

Analysis of the data by sex showed that men were much more responsive to the effects of SGLT2i in terms of BMI reduction than women (ΔBMI men -1.44±1.26 vs ΔBMI women -0.36±1.48, p<0.01); no significant differences were found between men and women in HbA1c changes. Otherwise, women were more responsive to the effects of GLP1-RA in terms of BMI reduction than men (ΔBMI women -2.31±2.23 vs ΔBMI men -1.2±1.63, p<0.05); the effect of GLP1-RA on HbA1c was comparable in the 2 groups (ΔHbA1c women -7.82±2.06 vs ΔHbA1c men -8.15±2.06, p=0.76).

Conclusion: There were significant sex and gender differences in the response to treatment with SGLT2i or GLP1-RA in people with T2DM and obesity, particularly in the effect on BW, with greater BW loss in men and older people treated with SGLT2i and a better response in women with GLP1-RA. Clinical and practical implications of the results obtained from this study will be useful to implement personalized medicine.

PO4.451

MiR-590-5p is able to predict type 2 diabetes mellitus improvement after bariatric surgery in patients with severe obesity

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Introduction: The IDF has proposed bariatric surgery as a treatment for type 2 diabetes mellitus (T2DM). However, it should be noted that approximately 20% of individuals with T2DM do not respond positively to this intervention. T2DM is a major public health problem, which also involves the development of multiple associated pathologies. This underscores the necessity for novel approaches to identify biomarkers that can predict patient response to surgical interventions, and would mean a clear reduction in invasive interventions in patients who do not respond to this technique. The objective of this study is to investigate and evaluate several biochemical and anthropometric variables, in addition to their combinations with different microRNAs (miRNAs), with a view to formulating an algorithm that possesses predictive ability to identify patients with severe obesity (SO) and T2DM who have undergone surgery to reverse their T2DM.

Methods: In a previous study, our group made a selection of miRNAs associated with T2DM remission after bariatric surgery using a miRNA expression panel in a small cross-sectional study. The selection of these different miRNAs was then studied in a prospective study with 33 subjects with SO (BMI ≥ 40 kg/m^2) and T2DM, divided into two groups: 23 subjects who remitted T2DM (SO-R) and 10 subjects who did not remit T2DM (SO-NoR) after one year of bariatric surgery. Different biochemical and anthropometric variables were measured. The total miRNAs present in the serum were extracted by automated methods, and the expression levels of a specific microRNA, miR-590-5p, were analysed by real-time PCR. This analysis was performed to determine the potential of miR-590-5p as a predictive biomarker. Combining different variables through logistic regression and ROC curve analysis enabled the determination of the most efficacious diagnostic algorithm.

Results: We observed significant differences (p=0.031) in miR-590-5p levels between both groups, with higher levels found in the SO-R group (1189.4±277.36) compared to the levels found in the SO-NoR group (365.3±143.6). We performed different ROC curves to compare the prognostic ability of mir-590-5p and/or its combination with other variables to discriminate between SO-R and SO-NoR. The combination of miR-590-5p together with BMI and baseline glucose significantly improved the predictive ability of the model reaching an area under the curve (AUC) of 0.90.

Conclusion: The combination of the variables serum miR-590-5p levels/basal glucose/BMI allows the construction of an algorithm with a prognostic capacity of 90% to identify subjects with SO and T2DM who respond favourably to bariatric surgery to reverse T2DM.

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PO4.452

The effects of Sleeve Gastrectomy on the improvement and/or remission rates of Insulin resistance, Type-2 diabetes mellitus, Hypertension and Dyslipidemia at Mid-term follow up post-surgery

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Introduction: Insulin Resistance (IR) is a major risk for cardiovascular diseases which are the leading cause of death worldwide. Sleeve Gastrectomy (SG) induce remission and /or improve a variety of obesity-related comorbidities due to its effects on IR, gastrointestinal hormones - Gastric Inhibitory Peptide (GIP), Glucagon Like Peptide-1 (GLP-1), Ghrelin, inflammatory markers and the TWL % (total weight loss). The current study showed the rates of remission and/or improvement of diabetes, IR, hypertension, and dyslipidemia at midterm follow-up post-SG.
Methods: a prospective cohort study conducted in Bariatric medicine clinics at Hamad Medical Corporation. We included any patient eligible for SG and agreed to participate, in order to assess the cardio-metabolic risk factors pre-SG and post-SG at mid-term follow-up (3 –5 years). Parameters included comorbidities such as (dyslipidemia, hypertension, type-2 diabetes), medications, lipids profile, blood pressure, insulin, fasting glucose, HBA1C, HOMA-IR (Homeostatic Model Assessment of Insulin Resistance). Disease status describes the standardized outcome reporting in metabolic and bariatric surgery –ASMBS.
Results: 48 patients were included, 16 patients have diabetes (33.3%), 33 patients have dyslipidemia (68.8%) and 15 have hypertension (31.3%). Mean± SD for the weight and Body Mass Index (BMI) pre surgery were 123.9 and 45.9 respectively. Post SG nadir weight reached and BMI means were 81.7±21 kg, and 30.5 kg/m^2. The TWL % was 33.4±10. Insulin and HOMA-IR-Mean± SD pre-SG were 32.0, 10.3 and post-SG 7.89 and 2.2 with significant P value (.000) (.000) respectively. Dyslipidemia resolution in 58.06% and improvement in 35.4 %, hypertension resolution in 62.28% and improvement in 35.71%, and diabetes remission in 71.42% and improvement in 28.57%.
Conclusion: SG can significantly decrease IR at mid-term follow up. It induced remission and /or improvement in multiple cardiometabolic risk factors, therefore it can be used as an effective tool to reduce morbidity and mortality in high-risk patients.

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Parameter	Status	Number	%
Dyslipidemia remission (n=31)	Remission	18	58.06%
	Improvement	11	35.4%
	Worsening	1	3.22%
	No change	1	3.22%
HTN Remission (n=14)	Remission	9	64.28%
	Improvement	5	35.71%
DM Remission (n=14)	Remission	10	71.42%
	Improvement	4	28.57%

The Status of the metabolic comorbidities post MBS (remission, improvement, no change, worsening)

Fig. 1. The status of the metabolic diseases- dyslipidemia, type 2 diabetes and hypertension post-MBS.

PO4.453

The Effect of Psychotherapy in the Management of Obesity: An Umbrella Review

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Objective: To assess the impact of psychotherapy on obesity treatment in outpatient settings.
Methods: The study targets adults with a BMI of 30 or higher, comparing psychotherapeutic interventions to usual care or no treatment. Key outcomes include weight loss, adverse events, depression, quality of life, and long-term BMI changes. Extensive database searches were conducted.
Results: Out of 1,334 articles reviewed, only 3 studies met the inclusion criteria, emphasizing the scarcity of relevant research. These studies primarily focused on behavioral and cognitive-behavioral strategies. Results showed that combining behavior therapy with diet/exercise led to greater weight loss than diet/exercise alone. Studies on cognitive therapy and general psychotherapy were less frequent and yielded weaker evidence. Despite varied methodologies, the findings suggest that behavioral therapy combined with dietary and exercise interventions offers improved outcomes, though more research is needed to strengthen these conclusions.
Conclusions: The study found that combining behavioral therapy with diet and exercise resulted in greater weight loss than diet and exercise alone. However, research on the impact of psychotherapy on obesity is limited, as only 3 studies met the inclusion criteria. Cognitive therapies and general psychotherapy provided weaker evidence. Therefore, further research is necessary to validate these findings and investigate alternative psychotherapeutic methods for treating obesity.

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PO4.454

Self-Prescription of GLP-1 Analogs for Weight Loss: A 2-Year Multinational Observational Study in Latin America and the USA

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Background: We investigated the use of GLP-1 analogs, initially developed for type 2 diabetes, which have proven effective in managing obesity through appetite regulation and metabolic improvement. Semaglutide, and tirzepatide for diabetes and weight loss, highlight their value in addressing obesity-related challenges.
Self-prescription of GLP-1 analogs has emerged as a concern in Colombia, Panama, Argentina, and the USA. Dissatisfaction with traditional weight-loss advice, such as "eat less, exercise more," often seen as simplistic, drives individuals toward unregulated alternatives. Limited access to multidisciplinary care, including nutritional counseling and psychological support, exacerbates this trend. This study examined the motivations, behaviors, and outcomes of self-prescription while identifying regulatory gaps and proposing strategies for safer management.
Objectives: We explored self-prescription behaviors for GLP-1 analogs in a multinational context, identifying drivers, assessing adverse effects, evaluating adherence barriers, and comparing outcomes of multidisciplinary care with self-directed approaches.
Methods: We conducted a descriptive observational study from January 2023 to January 2025 using convenience sampling. Participants aged 18 and older who self-prescribed GLP-1 analogs without medical oversight were recruited through online surveys shared via social media and forums in Colombia, Panama, Argentina and USA.
The survey collected demographic data, motivations for use, adverse effects, and adherence patterns. Data analysis was performed using STATA 17.0 with a target sample size of 400 participants.
Preliminary Results: 84% of participants reported frustration with traditional weight-loss methods as their primary reason for self-prescription. Non-scientific sources like social media, gyms, and spas heavily influenced decisions by promoting GLP-1 analogs as quick, risk-free solutions. Adverse effects, including nausea, vomiting, and diarrhea, were more frequent among individuals with obesity. Those using compounded formulations or unregulated sources reported more severe symptoms.
Women and men with obesity were most likely to self-prescribe GLP-1 analogs. Most participants had higher education levels, suggesting dissatisfaction with healthcare systems rather than low health literacy. Only 15% adhered to treatment for more than two years, though 55% reported short-term benefits. Participants accessing multidisciplinary care, including CBT and nutritional counseling, achieved better and more sustainable results.
Conclusions: Self-prescription of GLP-1 analogs is widespread in Latin America and USA, fueled by dissatisfaction with traditional approaches and reliance on non-scientific information. While some report short-term benefits, adverse effects and low adherence raise safety concerns. Strengthened regulatory frameworks and improved access to multidisciplinary care are needed to reduce reliance on unregulated practices.
Impact: This research highlights the need for evidence-based interventions and public health strategies to address regulatory gaps, enhance care access, and promote safer obesity management practices.

PO4.455

Glucagon-Like Peptide-1 Analogs Reduce Alcohol Intake

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Introduction: Alcohol use disorder is a chronic relapsing condition that poses global health challenges representing 4.7% of all global deaths. Its treatments relapse rate is 70% within the first year of treatment. In preclinical animal studies, glucagon-like peptide-1 receptor agonists (GLP-1 RAs) reduced alcohol intake and attenuated alcohol-induced behaviors.
Data were prospectively collected over 15 months (January 2023–March 2024) from 262 adults (BMI ≥27 kg/m²) who initiated liraglutide or semaglutide. Demographics, weight/BMI, therapy details (type, dose, frequency, and duration), and self-reported alcohol intake were extracted from electronic health records with manual validation at baseline and 3–6 months follow-up. Alcohol intake was categorized into non-drinkers, rare drinkers, and regular drinkers, and weekly units were recorded when quantifiable. The primary outcome was the change in alcohol intake from baseline to follow-up, while the secondary outcome was the change in body weight. Because of non-normal data distribution, the Mann-Whitney U test was used to assess changes in alcohol intake ($p<0.05$ significant), and Pearson correlation coefficients evaluated the relationship between changes in alcohol intake and weight loss. The study was approved by St Vincent's Healthcare Group (reference 2024/4161), and all participants provided data voluntarily as part of routine clinical care.
Results: Of the 262 patients (79% female, mean age 46 years) treated with GLP-1 RAs, 31 (11.8%) were non-drinkers before the intervention, 52 (19.8%) consumed alcohol rarely, and 179 patients (68.3%) consumed alcohol regularly. Of the patients who drank alcohol regularly before the intervention (n=179), 143 patients (54.6%) had quantifiable alcohol intake recorded, while 36 patients (13.7%) had non-quantifiable alcohol intake recorded. After initiating GLP-1 RA in 262 patients, 188 (71.8%) had at least two visits during the study, with a mean interval to the second visit of 112 days. 74 patients (28.2%) were lost to follow-up. Post-intervention, alcohol intake (quantifiable and non-quantifiable) was documented for 117 patients (44.7%). 31 patients (11.8%) had non-quantifiable intake, while 86 patients (32.8%) had quantifiable alcohol intake. No patient reported an increase in alcohol intake. Alcohol intake reduced from a pre-intervention mean±SEM of 11.8±1.0 units/week to a post-intervention mean of 4.3±0.5 units/week ($p < 0.001$). For patients consuming ≥11 units/week (high consumers), intake decreased from 23.2±1.8 units/week to 7.8±0.9 units/week. For those pre-intervention consuming <11 units/week (low consumers), intake decreased from 5.5±0.3 units/week to 2.5±0.3 units/week. Mann-Whitney U tests confirmed the reduction for both high consumers ($U = 78$, $Z = 6.7$, $p < 0.001$) and low consumers ($U = 1118$, $Z = 5.76$, $p < 0.001$).At the second visit, weight loss was calculated for 181 participants (69.1%), with a mean loss of 7.7±0.3 kg after approximately four months. A weak positive correlation was observed between alcohol reduction and weight loss in patients with data for both alcohol intake and weight at both visits ($r = 0.24$, $n = 72$).

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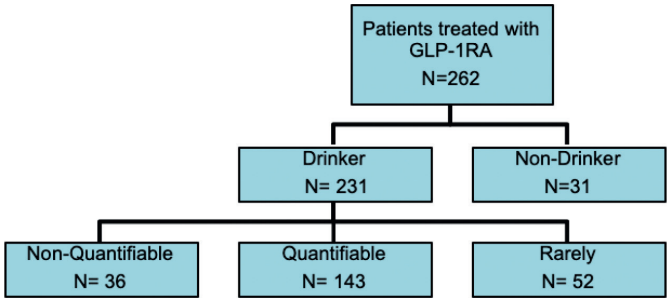


Fig. 1. Alcohol Intake Before Intervention.

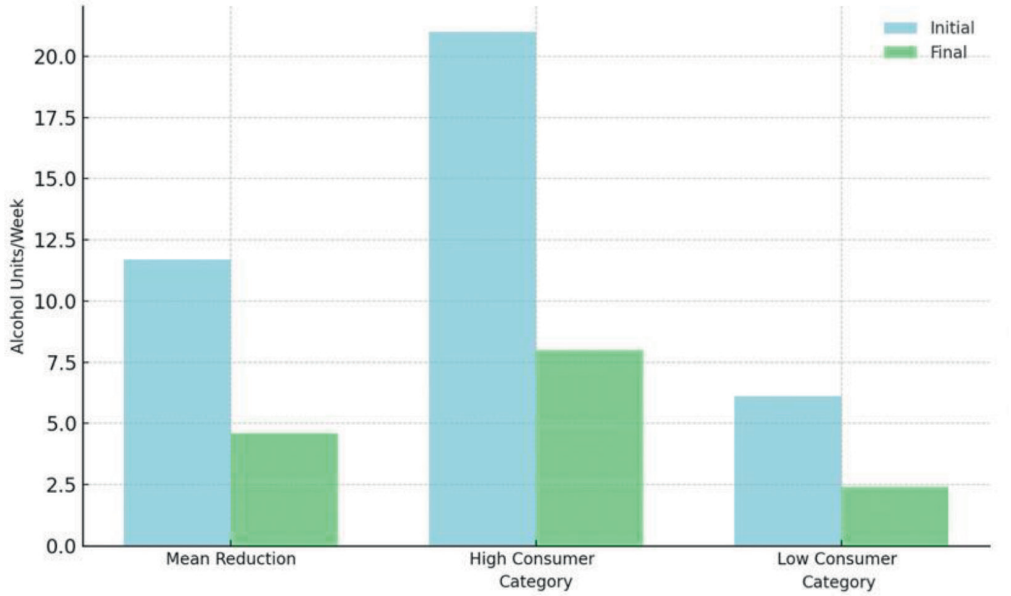


Fig. 2. Alcohol Intake Reduction After Intervention.

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