



CHAPTER 14

NUTRITION AND PUBLIC HEALTH

Asst. Prof. Volkan MEDENİ¹

1. Concept of Nutrition

Nutrition forms the basis of health at every stage of life. It is to take and use in the body, most economically, the nutrients that will provide sufficient energy and nutrients required for growth, development, and living a healthy and productive life for a long time without losing their nutritional value or harming health (1). Nutrition habits include a person's behaviors, such as the number of meals per day, the types and amounts of foods consumed, and purchasing, preparing, cooking, and serving food (2).

Various factors play a role in food selection and eating habits. Eating habits of individuals and societies are formed and developed under the influence of these different factors. Living in a city or rural area, the geographical, climate, and agricultural conditions of the place of residence, beliefs, traditions-customs, socioeconomic conditions, and level of nutritional knowledge cause the emergence and development of nutritional habits (2,3). Every society has its eating habits, customs, opportunities, practices, and nutritional culture. Nutritional habits, guided by various socioeconomic, cultural, and educational activities, are acquired early (4,5).

The term adequate and balanced nutrition describes the energy and nutrients required for the body's growth, renewal, and functioning in sufficient amounts and their appropriate use in the body. When nutritional elements cannot be taken at the required level by the body, inadequate energy is not produced, and body tissues cannot be built, malnutrition occurs. If a person eats more than necessary, he takes in more nutrients than necessary. Some items consumed in excess are

¹ Gazi University, Faculty of Medicine, Department of Public Health
ORCID: 0000-0002-2544-5781

harmful to health because they accumulate as fat in the body. This situation is unbalanced nutrition (6).

Nutrition is a right in international human rights documents, and the nutritional status of a country is considered one of that country's most essential welfare indicators. Adequate and balanced nutrition is one of the primary conditions for society and individuals to live healthy and strong, develop economically and socially, and increase welfare (7).

In order to achieve the expected quality of life in the process of globalization, healthy nutrition must exist in a lifestyle by increasing the nutritional awareness of all individuals and society. The healthy living and economic development of society depend on the health of the individuals who make up it. The basis of health is adequate and balanced nutrition (8).

2. Nutrition and Health Problems in the World and Türkiye

The cycle of malnutrition begins before birth and continues until death. Unhealthy nutrition problems appear as a problem in all periods of life. Unless the chain that creates the cycle is broken, serious health problems may arise (9). The main groups affected by malnutrition are infants, children, teenagers, women of childbearing age, pregnant and lactating mothers, older people, and workers. In adults, obesity and the diseases it causes are crucial public health problems. Investigating the causes of unbalanced nutrition reveals that a lack of nutritional information is crucial. (10).

If the body lacks any nutrients, it cannot fulfill the function of that nutrient. Inadequate and unbalanced nutrition is the direct cause of many diseases such as beriberi, pellagra, scurvy, marasmus, and rickets. It also plays an essential role in the severe course of many other diseases, such as measles, whooping cough, tuberculosis, and diarrhea (6). Individuals with household incomes below the food poverty line are at risk of malnutrition. The effects of food aid programs provided to these impoverished households with income below the hunger line are valid for the short term. Additionally, it is difficult for these aid programs to reach all people experiencing poverty. Eliminating poverty in the long term is possible with economic development that reaches all segments (11).

Total protein consumption per capita in Türkiye is sufficient. However, most of the protein is from plant sources, and animal protein consumption needs to be increased. The primary food is bread and other grain products. When the changes in food consumption trends over the years are examined, it is seen that the consumption of bread, milk, yogurt, meat products, and fruit is decreasing. The

consumption of legumes, eggs, and sugar has increased. Although there is generally no significant difference in the total amount of oil consumption, it is observed that the consumption of vegetable oil increases compared to solid oil (12).

3. Nutritional Elements and Their Effectiveness in Body Work

Nearly fifty nutrients in the composition of foods can be grouped into five groups according to their chemical structures and effectiveness in body functioning. They are listed as proteins, fats, carbohydrates, minerals, and vitamins. It is also correct to add water to those (13).

3.1. Proteins

Proteins are the basic substance of all living cells. Therefore, it is responsible for the construction and survival of tissues and the repair of worn-out cells. Some hormones and enzymes that play a role in the chemical events in the body have a structure that contains it. It produces antibodies, which are the body's defense against diseases. Proteins are necessary to maintain acid-base balance in the body (14).

3.2. Oils

Fat is the main energy source of humans. When energy is not sufficient, the body uses this storage. Fat is the nutrient that provides the most energy. Some of the vitamins are taken into the body through fat. Since fat leaves the stomach slowly, it gives a feeling of satiety. Subcutaneous fat prevents rapid loss of body heat. Some of the building blocks of fat are necessary to produce some hormones that are effective in the body's regular functioning (6).

3.3. Carbohydrates

The most important function of carbohydrates is to provide energy. It is widespread in plant foods. It helps keep water and electrolytes in balance in the body. Since glucose is the brain's only energy source, it is necessary for cognitive functions. It allows proteins to be used for energy. The indigestible carbohydrates found in plant foods constitute fiber. Fiber ensures movement and easy evacuation of the intestines (15).

3.4. Minerals

Minerals are a group of essential nutrients that form the structure of our body and regulate many functions. Minerals are also in bones, teeth, muscles, blood, and other tissues. Minerals whose daily requirement is over 250 mg are macro minerals. This group contains sodium, potassium, chlorine, calcium, magnesium,

and phosphorus. Those whose daily requirement is below 20 mg are called trace elements. Iron, zinc, iodine, and selenium are examples of trace elements (16).

3.5.Vitamins

Vitamins are necessary for normal metabolic events in the body and for maintaining a healthy state. Which cannot be synthesized in the body or are synthesized insufficiently and must be taken in small amounts from the environment in foods. A balanced diet provides enough vitamins to meet the body's daily needs (17).

3.6.Water

Water is essential for the life. It is necessary for the digestion, absorption, transportation, and metabolism of nutrients in the food. It ensures that harmful waste materials from metabolism are excreted through the kidneys. Water reduces stomach contractions caused by hunger due to its appetite-suppressant effect. The body needs at least 2 liters daily to maintain water balance (18).

4. Food Groups and Meals

The foods differ in terms of the types and amounts of nutrients they contain. Some foods are rich in protein, and some in vitamins. People who consume too much of one group of foods and none of the other groups have an unbalanced diet. If the daily diet includes nutrients from all groups and their amounts are appropriate to the needs, adequate and balanced nutrition is achieved. We can group foods into four groups in terms of their nutritional values. Food groups are as follows (6).

- ✓ Milk and foods made from milk
- ✓ Meat, eggs and legumes
- ✓ Cereals and their products
- ✓ Vegetables and fruits

Each food differs in terms of the nutrients it contains. No food contains all the nutrients necessary for an adequate and balanced diet. However, some foods can replace each other because they are similar in content. After studies on nutrition science began, scientists began to group foods and determine the daily amounts that should be consumed by each group (10).

The Food and Nutrition Council, headquartered in America, stated in 1958 that it would be appropriate to group foods into four groups. Collecting foods into four groups provides excellent convenience in determining the amounts

consumed by these groups and making daily nutrition plans (19). The Council started using the food pyramid in 1985, with the idea that showing foods in a pyramid and showing foods that will be consumed in large amounts at the bottom of the pyramid and foods that will be consumed less at the top of the pyramid would make it easier to raise public awareness about nutrition. Countries make changes according to their eating habits in the pyramid (20).

Taking into account the food production and nutritional status of Türkiye, it was decided that it would be more appropriate to use four food groups in planning the essential nutrients that should be taken daily, and four-leaf clover was used to express the groups with shapes (13).

There are pictures of food groups on the clover's upper, lower, right, and left leaves. Milk and dairy products are shown on the upper sheet. Since Turkish people consume this group very little, it is shown as the upper leaf to emphasize the importance of the group. The second group, which forms the right leaf of the clover, includes the meat-egg-legume group. The third group, located on the lower leaf of the clover, represents vegetables and fruits. The fourth group is the left leaf of the clover and represents bread and grains (10).

The digestion and use of ingested food by the body varies depending on the composition of the food and the time elapsed between meals. Depending on the mixture, amount, and intervals of administration of nutrients, a number of hormonal and enzymatic changes occur in the body, and the body tries to survive by adapting to these conditions. However, in one-sided nutrition, starvation, or overnutrition, the changes caused by the organisms in these systems ultimately cause health to be negatively affected (21). Dividing daily energy intake into 5-6 meals increases energy expenditure due to the thermogenic effect of foods. In addition, small and frequent feedings are recommended as they reduce hunger and food intake at the next meal. For the metabolism to work regularly, considering daily living conditions, it is recommended that food be consumed in at least three meals a day and that the time between meals is 4 to 5 hours (22). These changes are more clearly seen when the organism is starved for a certain period. When food is eaten in short intervals, a positive nitrogen balance is created in the body, and body proteins increase. On the contrary, when eating for long periods, fat accumulation in the body increases, increasing blood fat levels (20).

When skipping meals becomes a habit, the person is prevented from eating adequately, and problems due to malnutrition occur. In order to have adequate

and balanced nutrition, the daily diet must be consumed in at least three main meals and two snacks. A diet of two meals or less will disrupt metabolism (11,23).

Skipping meals and irregular eating habits affect the type and amount of food consumed at meals. It causes the foods that suppress hunger to be preferred over foods with high fat and carbohydrate content. Less than three meals increases insulin response, triglyceride synthesis, and fat storage. The habit of skipping meals is common in obese individuals, and the most frequently skipped meal is breakfast (24).

In adequate and balanced nutrition, the content of meals is as important as the number of meals. A balanced distribution of nutrients in meals is necessary. The more balanced the distribution of nutrients in meals, the more regularly the metabolism works. The energy content of meals from carbohydrates, protein, and fat should be 55-60%, 10-15%, and 20-30%, respectively. A balanced distribution of nutrients in meals is vital for metabolic order (13).

5. Disadvantages of Inadequate and Unbalanced Nutrition

Studies show that the infant mortality rate in undernourished societies is ten times higher than in adequately nourished societies. Malnutrition is a significant cause of infant mortality, especially in underdeveloped countries. Malnourished children's growth rate and intelligence development are also lower than expected. Health problems, such as cardiovascular diseases and cancer, which are more common in older age groups, occur due to imbalance and malnutrition, especially in developing countries. Infectious diseases are more common, have a more severe course, and are more lethal in undernourished societies, and chronic diseases become apparent (25,26).

Inadequate and unbalanced nutrition is one factor that shortens an individual's life span. Poor eating habits weaken the immune system of individuals. Therefore, it causes the person to get sick quickly and the course of the disease to be severe and prolonged. It also causes physical and psychological problems that prevent the individual from being productive. People who constantly struggle with illnesses feel hopeless about life. Expenditures made for treating diseases affect the person negatively (27).

Inadequate and unbalanced nutrition reduces a person's ability to work, plan and create. The first condition of being economically developed is to be able to use the workforce to increase production. Individuals who are mentally and physically ill-developed, tired, reluctant, and sick due to inadequate and

unbalanced nutrition are a burden for society. Moreover, social disorder is common in societies where malnutrition prevails (6).

In particular, the imbalance and injustice of income distribution make the problem of inadequate and unbalanced nutrition a chronic problem. If the factors related to unhealthy nutrition are not eliminated, inadequate and unbalanced nutrition will lead to moral, legal, social, and cultural problems (28).

REFERENCES

1. Yücecan S. Besin Tüketimindeki Değişimler ve Yeni Eğilimler. Türk Mutfak Kültürü Üzerine Araştırmalar. Ankara, 1999.
2. Sürücüoğlu MS. Beslenme ve Sağlığımız. Standard. 1999;38(448):40-52.
3. Pekcan G. Zeytinyağı ve Akdeniz Mutfağı: Genel Özellikleri ve Değişmeler. Dördüncü Milletlerarası Yemek Kongresi-Kongre Kitabı. Konya, 1993.
4. Sürücüoğlu MS, Özçelik AÖ. Antropometrik Yöntemlerle Beslenme Durumunun Değerlendirilmesi. Dokuzuncu Ulusal Ergonomi Kongresi-Kongre Kitabı. Denizli, 2003.
5. Açıık Y, Çelik G, Ozan A, Oğuzöncül A, Deveci S, Gülbayrak C. Üniversite Öğrencilerinin Beslenme Alışkanlıkları. Sağlık ve Toplum. 2003;13(4):74-80.
6. Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü. Saha Personeli İçin Toplum Beslenmesi Programı Eğitim Materyali. Ankara, 2002.
7. Soylu M. Sağlıklı Beslenme-Sağlıklı Süt, I.Ulusal Sağlığı Geliştirme ve Sağlık Eğitimi Kongresi-Kongre Kitabı. Muğla, 2006.
8. Hacettepe Üniversitesi Sağlık Bilimleri Fakültesi, Türkiye Beslenme ve Sağlık Araştırması 2010-Saha Uygulaması El Kitabı. Ankara, 2010.
9. Allen LH, Gillespie SR, What Works-A Review of the Efficacy and Effectiveness of Nutrition Interventions. The Asian Development Bank Nutrition and Development Series. Manila, 2001.
10. Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü. Türkiye'ye Özgü Beslenme Rehberi. Ankara, 2004.
11. Şengül S. Türkiye'de Gelir Gruplarına Göre Gıda Talebi. Orta Doğu Teknik Üniversitesi Gelişme Dergisi. 2004;31:115-148.
12. Pekcan G, Karaagaoglu N. State of Nutrition in Turkey. Nutrition and Health. 2000;14(1):41-52.
13. Hacettepe Üniversitesi Sağlık Bilimleri Fakültesi. Türkiye'ye Özgü Besin ve Beslenme Rehberi. Ankara, 2015.

14. Türk Böbrek Vakfı. Sağlıklı Bireyler İçin Temel Beslenme El Kitabı. Ankara, 2016.
15. Millî Eğitim Bakanlığı. Besin Ögeleri ve Besin Grupları. Ankara, 2011.
16. Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü. Vitaminler, Mineraller ve Sağlığımız. Ankara, 2006.
17. Akkan AG. Vitaminler. Cerrahpaşa Tıp Fakültesi Sürekli Tıp Eğitimi Etkinlikleri-11. İstanbul, 1999.
18. Türkiye Endokrinoloji ve Metabolizma Derneği. Diyabet ve Sağlıklı Beslenme. Ankara, 2011.
19. Millî Eğitim Bakanlığı. Gıda Teknolojisi-Sağlıklı ve Dengeli Beslenme Kuralları. Ankara, 2017.
20. Millî Eğitim Bakanlığı. Öğün Planlama. Ankara, 2011.
21. Gül T. Sağlıklı Beslenme Kavramı ve Üniversite Öğrencilerinin Beslenme Alışkanlıklarına Yönelik Tutum ve Davranışları: Çukurova Üniversitesi Örneği. Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Ekonometri Anabilim Dalı. Yüksek Lisans Tezi. Adana, 2011.
22. Sağlık Bakanlığı Türkiye Halk Sağlığı Kurumu. Ergenlerde Sağlıklı Beslenme ve Hareketli Yaşam. Ankara, 2012.
23. Sağlam F. Hızlı Hazır Yemek Sistemi (Fast Food) Üzerindeki Bir Çalışma. Beslenme ve Diyet Dergisi. 1991;20(2):187-197.
24. Yurttagül M. Hafif Şişman ve Şişman Kadınların Beslenme Alışkanlıkları ve Zayıflamaya İlişkin Davranışları. Beslenme ve Diyet Dergisi. 1995;24(1):59-73
25. Aykut M. Toplum Beslenmesi. Halk Sağlığı Genel Bilgiler. Ed: Öztürk Y, Günay O. Erciyes Üniversitesi. Kayseri, 2011.
26. Millî Eğitim Bakanlığı. Beslenme İlkeleri. Ankara, 2011.
27. Tunçer P. Yeni Kamu Yönetimi Anlayışı Sürecinde Kentleşme ve Beslenme, The Journal of Academic Social Science Studies. 2015;40:225-245.
28. Bilge A. Bayram E. Can İN, Biniciler İ. Hekim Gözüyle Sağlıklı Beslenme ve Öne Çıkan Güncel Konular-İnceleme ve Değerlendirme. Ankara, 2013.