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Introductory Chapter: Life, Health and Body Mass Index

Ayşe Emel Önal

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1. Introduction

The main areas of interest of Public Health are physical, social, and psychological health promotion, protection from diseases, and reaching the longest life possible by the genetic structure of man. As is known, air, water, and food are essential for life. We take the energy we need for life from the food we consume every day [1, 2].

Primary health care is the minimum health care that governments have to offer as a result of a publicly funded spending. Improving the nutritional status of the community and providing clean water to the community is essential for the continuity of life. While good nutrition of individuals in health protection and prevention of diseases is one of the primary protection measures, governments need to ensure food control and safety in environmental measures [2, 3].

The methods used to diagnose diseases during periods of asymptomatic or mildly symptoms are called secondary protection or screening. With screening methods, risky individuals for diseases or diseases are identified and the treatment of diseases, if any, can be treated with no difficult, and the development of complications and disabilities are prevented [4].

A healthy nutrition is the adequate intake of the nutrients needed to ensure the growth, development and continuity of the daily functions of the body. If healthy nutrition does not occur, malnutrition, unbalanced nutrition, and overnutrition occur. There are many nutritional diseases within these groups. Early diagnosis can be made by calculating the body mass indexes of individuals who are susceptible to these diseases or who are at the initial stage of the disease. The diagnosis is then confirmed using definitive diagnostic methods so that it can be treated at an early stage. According to these calculations, if the person is not ill but the body mass index is outside the normal limits, primary prevention measures are applied.

Nutrition is the process from taking nutrients to digestion, absorption, transport to tissues, and use by cells. The number of calories that we have to take in pregnancy, lactation, infancy, childhood, adolescent age, adulthood, and old age are different and the principles of healthy nutrition show different characteristics in these periods. Childhood malnutrition leads to diseases of protein energy malnutrition such as marasmus and kwashiorkor. Adults often develop cachexia with a chronic degenerative disease such as cancer [5, 6].

Unbalanced nutrition usually lacks one or more nutrients. As in the past, vitamin D deficiency, iron, folate, vitamin B12 deficiency, and iodine deficiency are common in children and adults living in economic deprivation areas. Scurvy (vitamin C deficiency), infantile beriberi (deficiency of thiamin (vitamin B1)), aribofilavinosis (riboflavin (vitamin B2) deficiency), pellagra (niacin deficiency), and vitamin B6 deficiency, xerophthalmia (deficiency of vitamin A) are diseases seen in regions with economic deprivation and also in some severe acute infections or noninfectious chronic diseases [6, 7]. Osteoporosis, cataract, and mental dysfunctions in the elderly were associated with vitamin and mineral deficiencies [8].

From past to present, human nutrition has undergone a transformation over time. This transformation has changed from herbal nutrition to hunting, from ready food to genetically modified food [9]. This change and diversity has come to prominence especially in recent years. Nowadays, mostly foods have high glycemic index, too much salt, too much oil and energy, and little vitamins and minerals. Together with changing living conditions such as inactivity, have increased the frequency of obesity in the world and the incidence of obesity-related chronic noncommunicable diseases such as diabetes mellitus, cardiovascular diseases, cerebrovascular diseases, renal diseases, and peripheral artery diseases [10, 11].

Obesity is an energy metabolism disorder caused by excessive fat storage in the body and causing physical and psychological problems. Obtaining more energy than consumed is the most important cause of obesity, but physical activity habits, some environmental reasons, hormones, gut microbiota, and genetic structure are also effective in the development of obesity [12, 13].

The MONICA study was conducted by WHO in six different regions of Asia, Africa, and Europe and reported to have increased obesity prevalence in 10 years. There was a trend of increasing body mass index with half the female populations and two-thirds of the male populations [14].

The WHO Regional Office for Europe reported that overweight in the world affected 35% of adults over 20 years of age (BMI ≥ 25 kg/m^2) (34% men and 35% of women). According to this report, 12% of the world's population (10% of men and 14% of women) is obese. Between 1980 and 2008, the prevalence of obesity (BMI ≥30 kg/m^2) in the world has doubled [15]. Finucane et al. indicate that between 1980 and 2008, mean BMI worldwide increased by 0·4 kg/m^2 per decade for men and 0·5 kg/m^2 per decade for women [16].

Body mass index is the most commonly used method in adults to determine nutritional status (and therefore obesity). BMI, formerly called the Quetelet index, is calculated by proportioning the body weight to the square meter in meters (kg/m^2). The BMI value is considered to be normal between 18.5 and 24.9, overweight between 25 and 29.9, and obese at 30 and above [17].

Obesity in children is more commonly evaluated with percentiles. The recommended cutoffs are: >95th percentile: overweight, 85th–95th percentile: risk of overweight, and <5th percentile: underweight. However, there are also tables and graphs of the WHO and the Centers for Disease Control and Prevention (CDC) showing the BMI of the children's percentile values [18–20].

Other methods of obesity determination are weight scales arranged according to height-age-gender. Based on these standards, it is possible to decide whether the body weight is normal or not. Z score, waist-hip ratio, skinfold thickness measurement, and body fat percentage measurement are other methods used in the diagnosis of obesity.

Many studies have found a relationship between overweight and obesity and sleep disorders and physical activity limitation [21]. The relationship between depression and BMI has also been investigated. It has been found that BMI does not reduce depression, but there is no clear finding that it increases [22, 23].

The relationship between BMI and osteoporosis has also been investigated. Some studies concluded that increasing fat mass may not have a beneficial effect on bone mass [24]. Contrarily, some study concluded that obese women or obese elderly had lower prevalence of osteopenia compared with normal weight subjects and also with lower prevalence of osteoporosis as compared to normal- and overweight women [23, 25]. It is also reported that high BMI is associated with breast, colon, prostate, endometrium, kidney, and bladder cancers [26–29]. Obesity has also been reported to be associated with asthma, osteoarthritis, gout, bladder diseases, pancreatitis, dementia, nonalcoholic fatty liver disease [30].

In addition, BMI was also associated with mortality. Mortality rates increase with increasing degrees of overweight, as measured by body mass index [31, 32].

Ways to resolve health problems due to inadequate and unbalanced diet can be summarized as follows: the fight against poverty, the development of food policies by governments, the protective policies that health authorities will initiate and continue. Main foods, especially bread, must be enriched with vitamins and minerals whose deficiencies are frequently observed. Vitamins and minerals such as B2, B6, B12 vitamins, folic acid, iron, zinc, and calcium are nutrients that can be added to foods.

Many countries have initiated control programs to combat obesity. These programs have been reported to reduce both the prevalence of obesity and the associated chronic noncommunicable diseases. Having an active life, reducing energy intake, limiting salt and saturated fats and refined sugars, restricting processed food consumption are among the measures to combat obesity.

Finally, programs organized for the prevention of diseases related in a healthy diet and malnutrition consisting of Turkey are as follows, and all of them are based on weight control and BMI measurement.

• Breastfeeding and Baby Friendly Health Institutions Program [33]

• Breastfeeding Protection, Promotion of Prevention and Control of Iron Deficiency Anemia With Support Program "Turkey Strong as Iron Project," 2004- [34]

• Program for the Prevention of Vitamin D Inadequacy and Bone Health Development in Infants, 2005- [35]

• Turkey Complementary Nutrition Program, 1990- [36]

• Healthy Nutrition, Let's Protect Our Hearts Program, 2004- [37]

• Fight Against Obesity Program, 2010-2014 [38]

- Turkey 2010-2014 program on healthy eating and active lives [39]

- Turkey Excessive Salt Consumption Reduction Program, 2011-2015 [40]

- Turkey Diabetes Prevention and Control Program, 2011-2014 [41]

- Turkey Diabetes Program, 2015-2020 [42]

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