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DOI https://doi.org/10.30525/978-9934-26-514-3-20

OBESITY AS A CHALLENGE FOR THE 21ST CENTURY

ПРОБЛЕМА ОЖИРІННЯ У 21 СТОЛІТТІ

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1. Concept, types and methods for measuring obesity

Obesity is a conditioned increase in body weight significantly above normal values established for a given age, sex and race[1]. The interpretation of obesity is found in many scientific disciplines, with a common important element being the universal body mass index BMI for the diagnosis of overweight and obesity. In medical science, obesity refers to a progressive and recurrent disease characterised by excessive body fat that worsens health, increases the risk of complications and shortens life expectancy [2]. According to the World Health Organisation (WHO), obesity is an abnormal, excessive and detrimental accumulation of body fat in the human

body that leads to a number of chronic diseases and is the result of a sustained positive energy balance over a long period of time [3].

The location of excess adipose tissue has a strong influence on the degree of risk of obesity-related diseases. A distinction is made between abdominal obesity (apple type) and thigh and buttock obesity (pear type). To differentiate the type of obesity, the WHR index is used, which determines the distribution of body fat [4]. A distinction is also made between primary obesity (abnormal eating habits and lifestyle) and secondary obesity (effect of disorders caused by disease processes).

The location of body fat influences the risk of obesity-related diseases. Obesity is divided into abdominal (apple-type) and femoral-abdominal (pear-type), defined by the WHR index. The method for calculating WHR is outlined below: WHR=waist circumference(cm)/hip circumference(cm). Abdominal occurs with a WHR >0.85 in women and >0.9 in men, and femoral-abdominal with lower values[7].

BMI and waist circumference are used to assess obesity. In women, overweight is a circumference of 80–88 cm, obesity >88 cm, in men 94–102 cm and >102 cm respectively [5]. The method for calculating BMI is outlined below[6]: BMI=weight(kg)/height(m)^2. A BMI in the range 25–29.9 indicates overweight and ≥30 indicates obesity, classified as moderate (30–34.9), significant (35–39.9) or giant (≥40) [6]. In children, centile grids are used – overweight is the 90–97th centile and obesity above 97.

2. Causes and analysis of the magnitude of the obesity problem

The exact causes of obesity are not known, there is a complex relationship between biological, psychosocial and economic factors that influence the development of civilisation. The causes of obesity can be divided into different groups depending on criteria such as the source of the problem, the nature of the factors or the mechanisms leading to excessive weight gain. Normally, among the causes of obesity, one can distinguish between intrinsic and extrinsic and mixed causes.

Intrinsic causes of obesity are due to disturbances in metabolism, appetite and energy processing, often independent of conscious actions, e.g. related to specific alleles of the genome. [8] Hormones such as GLP, GIP, OXM, leptin, PYY, CCK and ghrelin, which regulate feelings of satiety and hunger, play an important role [8]. GLP and GIP, incretin hormones, increase insulin secretion, inhibit glucagon and delay gastric emptying in response to hyperglycaemia. OXM controls food intake and energy expenditure by acting on the hypothalamus [9]. Leptin inhibits Neuropeptide Y, reducing hunger, activating fat breakdown and raising body temperature. PYY and CCK inhibit appetite by signalling satiation, without affecting gastric emptying.[10] The opposite effect is exerted by ghrelin, which increases

gluconeogenesis, lowers insulin and stimulates gastric motility [9]. Adiponectin, inversely related to the amount of adipose tissue, decreases as the risk of obesity increases [11]. Treatment requires a comprehensive approach, combining medical interventions with education and support.

The external causes of obesity are due to environmental and social factors such as lifestyle, eating habits and physical activity, irrespective of genetic characteristics. Diet, based mainly on highly processed foods, rich in fats, simple sugars and salt, with a shortage of fibre, fruit and vegetables, plays a key role. The structure of the gut microbiota also influences absorption processes and energy balance, which promotes fat storage, especially in people with fewer fermentation-supporting bacteria [12].

Physical inactivity further contributes to obesity by reducing energy expenditure, leading to visceral and ectopic fat accumulation. Regular activity improves insulin sensitivity and fitness. Obesity can also have mixed causes, resulting from a combination of internal predisposition and external environmental conditions. Understanding these mechanisms allows obesity to be prevented and treated more effectively.

Obesity is a disease of civilisation of the world population and is recognised as an epidemic of the 21st century. It should be emphasised that there is a trend towards increasing levels of this phenomenon (Figure 1).

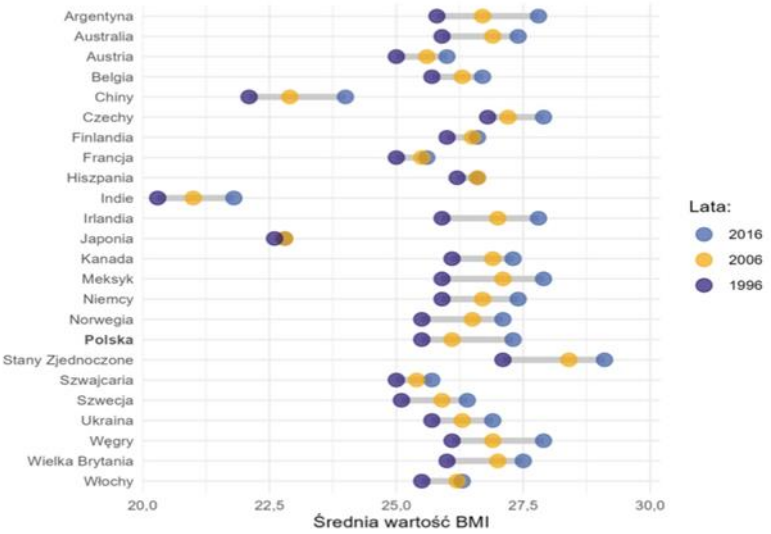

Fig. 1. Average BMI in adults by country, 1996, 2006, 2016

Source: compiled from WHO, NFZ Health Report. Obesity and its consequences. Warsaw 2024, p. 9.

The increase in obesity worldwide is often linked to a country's level of economic development. In more developed countries, such as the United States and Argentina, the increase in average BMI can be attributed to wealth, which allows easy access to highly processed, calorie-dense foods and facilitates the use of technology that reduces the need for physical activity.

Paradoxically, the wealth of developed countries often encourages habits that favour obesity – sedentary lifestyles, large portions of food and a culture of fast consumption are prevalent. At the same time, in developing countries, rising incomes and urbanisation are leading to lifestyle changes: traditional diets are being replaced by processed foods and physical activity is decreasing due to greater access to transport or office work. In contrast, in lower-income countries such as India and China, average BMI remains lower, which may be due to limited access to calorie-dense foods and a greater proportion of physical activity in daily life. Increased affluence in society not only increases the availability of food, but introduces habits and convenient lifestyles that encourage obesity [13].

3. Consequences of obesity

The problem of obesity poses a major socio-economic challenge, the consequences of which are felt by both individuals and societies as a whole. Focusing on the costs resulting from the limitations that obesity brings, several key areas can be identified: health, social and economic. The group of health costs includes complications from the systems: cardiovascular (hypertension, chronic coro, stroke), respiratory (obstructive sleep apnoea bronchial asthma), endocrine (hypothyroidism, hypercortisolemia), gastro-intestinal (gallstones), genitourinary (chronic kidney disease), musculo-skeletal (osteoarthritis) and skin (striae, cellulite, lymphoedema, burns) and malignant tumours. Metabolic complications such as type II diabetes mellitus and lipid disorders such as fatty liver disease should also be mentioned [2].

The social consequences of obesity arise from the exclusion and reduced quality of life of those affected. Often, obese people face discrimination in their everyday environment, e.g. at work, school. In addition, the problem of obesity also impacts on the lives of the family and community, including the health care system, increasing the need for public support. From an economic perspective, obesity generates huge costs for chronic disease management. Ultimately, obesity leads to huge economic losses due to reduced productivity, increased medical costs and adapting the environment to the needs of people with obesity. This problem calls for preventive measures, such as the promotion of healthy lifestyles, as treating the effects of obesity is much more costly than preventing its occurrence.

4. Summary and conclusions

Obesity has become a global health problem. It increases mortality and the risk of other diseases, and affects our mental and social health.

Obesity generates major economic and social challenges that affect the functioning of individuals, families and entire societies. The key to tackling the problem is education, investment in infrastructure and effective policies that reduce economic and social barriers, reducing the scale of the problem in the future.

Multidimensional action is needed to understand the causes, minimise the effects and implement effective prevention strategies.

It is important to undertake educational activities that identify methods to prevent obesity. Only a collective commitment to promoting health-promoting activities to raise awareness of the dangers of obesity can contribute to reducing the scale of the problem.

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