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Primary and Secondary Prevention of Obesity

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ABSTRACT

Introduction and purpose: Obesity is a persistent and recurring chronic condition marked by an excessive accumulation of body fat, which can deteriorate health, heighten the risk of complications, and shorten life expectancy.This review provides a comprehensive overview of the primary and secondary prevention of obesity, with a focus on interventions and strategies.

Material and methods: An extensive examination of articles published in scientific journals was carried out through online research platforms PubMed and Google Scholar. We searched articles by entering keywords in appropriate configuration: “primary prevention of obesity”, “secondary prevention of obesity”, “obesity”.

Description of the state of knowledge: According to published data, the growing problem of obesity translates into negative consequences in the form of the development of numerous complications associated with it and a shortening of the life expectancy of patients. Primary prevention of obesity includes health policy and health care, that aim to prevent the development of obesity. Secondary prevention focuses on detecting and treating obesity at an early stage to prevent the development of complications.

Summary: Implementing comprehensive primary prevention strategies across the population could substantially decrease the occurrence of numerous chronic conditions associated with overweight and obesity, yet effective large-scale programs to achieve this are currently lacking.

Keywords: “primary prevention of obesity”, “secondary prevention of obesity”, “obesity”

Introduction:

Obesity is a chronic disease characterized by excessive accumulation of body fat, which can lead to deteriorating health, heightened risk of complications, and reduced life expectancy. It has become a global epidemic, affecting individuals across all age groups and socioeconomic statuses [1] [2]. The World Health Organization characterizes obesity as an excessive and

harmful buildup of body fat that contributes to various chronic conditions, arising from a long-term positive energy balance where energy intake surpasses expenditure [3]. Regular measurement of weight, body mass index, and waist circumference are basic screening tests to diagnose overweight and obesity [1].

Obesity has a multifaceted etiology, with various genetic, epigenetic, hormonal, neurohormonal, psychological, social, and environmental factors contributing to its development. The prevalence of obesity in adults has more than doubled globally since 1990. As of 2022, over 2.5 billion people worldwide were overweight, with nearly 890 million classified as obese [3]. Data from the Center for Public Opinion Research indicates that in Poland, 21% of adults are obese, while 38% are overweight. Furthermore, projections suggest the percentage of obese individuals in the country could increase to 33% by 2035 [4] [5]. The increasing prevalence of obesity has been linked to various negative health outcomes, including the development of numerous complications and a reduction in life expectancy for affected individuals [6]. Preventing obesity and its associated health risks is a crucial public health objective.1 While the majority of interventions focus on diet and exercise, numerous other factors that indirectly influence weight management can also be addressed [7].

Table 1: Classification of Overweight and Obesity by BMI

Classification	BMI (kg/m2)
Underweight	< 18.5
Normal	18.5 – 24.9
Overweight	25.0 – 29.9
Obese I	30.0 – 34.9
Obese II	35.0 – 39.9

Obese III	≥ 40.0

Primary Prevention Strategies:

Primary prevention encompasses a wide range of activities aimed at preventing weight gain and the onset of obesity, particularly in the realms of health policy and healthcare [8].

The primary aim of prevention strategies is to reduce the occurrence of the disease within a given population [9].In view of the steadily rising obesity rates across diverse age groups, it appears prudent to implement primary prevention strategies targeted at the entire population. Its tasks should include the development of a health education program, especially in the area of healthy eating and increased physical activity. Poland has implemented prevention programs focused on healthy lifestyles in kindergartens and schools, but lacks similar initiatives targeting adults, including the elderly population. Educating the public on the importance of healthy eating is necessary [10]. This includes interventions such as displaying the calorie or nutritional value (e.g. on a 5-point Nutri-Score colour scale) of food products on packaging or additional taxation of unhealthy foods and drinks [11] [12]. Primary prevention strategies should also prioritize the restructuring of our environment to promote physical activity. This includes urban planning that facilitates walking, cycling and other physical activities (so that basic public facilities are accessible to residents within a 15-minute walk - the 15-minute city concept) or by bicycle (bicycle paths and bicycle parking facilities), and provide opportunities for frequent physical activity (parks, outdoor gyms, sports fields)[13]. Limiting the advertising of unhealthy, highly processed foods and sugary beverages is also reasonable, along with continuously updating regulations on the types of foods sold to children and adolescents in educational institutions[12]. Educating and training healthcare professionals in dietary counseling is another crucial component of primary obesity prevention efforts.

Smoking cessation

Patients should be informed that quitting smoking improves health, but may lead to weight increase. Healthcare professionals should proactively monitor the patient's weight and provide

guidance on maintaining a healthy weight while quitting smoking. The results of a meta-analysis indicate that the risk of death associated with the weight gain that accompanies quitting is significantly lower than that of continuing to smoke [14]. Patients who are overweight (BMI ≥27 kg/m2) and have comorbidities with obesity or who are obese and intend to stop smoking cigarettes may be considered for a naltrexone-bupropion combination preparation, which may prevent further weight gain [15]. In addition to smoking cessation programs, healthcare providers should also advise patients to adopt healthy lifestyle habits. This includes guidance on incorporating physical activity to promote rejuvenation and overall wellbeing, as well as recommendations for maintaining proper sleep hygiene and developing strategies to manage excessive stress [16].

Prevention of excessive weight gain before and during pregnancy

Another important primary prevention strategy is to address obesity in pregnancy. Preventing obesity in pregnant women is an extremely crucial task [17]. Excessive weight gain during pregnancy is, among other things, a risk factor for obesity after delivery. Pregnant women should also be counseled on the principles of healthy eating, physical activity and, in the case of initial excessive weight, appropriate dietary management and psychological interventions [18]. According to systematic review, nutrition and/or exercise interventions were linked to a 20% lower risk of excessive weight gain in pregnant women. These interventions also showed potential benefits, including decreased risks of cesarean delivery, fetal macrosomia, neonatal respiratory infections, and pregnancy-related hypertension [19]. Overweight or obese pregnant women have a significantly greater risk of developing gestational diabetes compared to those with a healthy body weight. To prevent the onset of diabetes, it is crucial to aim for a normal body weight during the preconception period and, once pregnancy begins, prioritize a nutritious diet, monitor body weight, and avoid excessive weight gain [20].

Use of drugs

Certain medications, including antipsychotics, antidepressants, antidiabetics, and corticosteroids, have been associated with varying degrees of weight gain risk. Healthcare providers should weigh the risks and benefits of prescribing these medications carefully and proactively monitor patients' weight. As part of primary prevention of overweight and obesity, physicians should, as far as possible, select pharmacotherapy taking into account among the its side effects the risk of weight gain. [21].

Antipsychotic drugs

The association of many antipsychotic drugs with weight gain has been well-documented. Of these, olanzapine and clozapine carry the greatest risk of this side effect. Insofar as clinically appropriate, pharmacotherapy should be started with drugs with less impact on body weight, especially if they are to be used long-term, and the patient's weight should be monitored during treatment. It may be beneficial to undertake behavioral interventions soon after starting antipsychotic treatment. In patients who require treatment for obesity, the use of drugs registered for this indication should be considered. [22].

Antidepressant medications

The weight gain associated with antidepressants, including tricyclic antidepressants, monoamine oxidase inhibitors, and selective serotonin reuptake inhibitors, is generally less pronounced compared to the weight gain seen with antipsychotics. Where possible, early intervention aimed at preventing excess weight gain should be considered. Observational studies have shown that dietary choices are associated with differences in weight gain. However, it should be weighed against the fact that depression precludes participation in some of the intervention studies undertaken to assess weight changes. There can be no certainty that nutritional therapy or physical activity are effective in preventing weight gain associated with antidepressant use, particularly in individuals, who were not obese at baseline. Weight gain can also result from untreated illness, especially atypical depression. It is worth mentioning that the antidepressant drug bupropion is a component of the combination preparation registered for the treatment of obesity [23].

Antidiabetic drugs

Excess weight is common among individuals with type 2 diabetes, and recommended weight loss can significantly improve blood sugar regulation and protect patients from developing other obesity-related health issues, or at least lessen their severity. Certain diabetes

medications, especially insulin and sulfonylureas, have been shown to increase the risk of weight gain.The mechanisms underlying the weight-increasing effects of certain antidiabetic therapies involve increased appetite, anabolic processes that promote tissue growth, as well as enhanced lipid deposition and fluid retention within the body.Metformin, the most commonly prescribed first-line medication for treating type 2 diabetes, has been observed to potentially contribute to modest weight loss. Metformin may also help mitigate weight gain associated with the use of other diabetes medications. Conversely, some antidiabetic drugs, such as GLP1 agonists or phlozin (inhibitors of sodium-glucose cotransporter 2 [SGLT2]), have been found to induce clinically significant weight loss. Taking this into account, when selecting antidiabetic medications, healthcare providers should consider the potential impact on body weight.

Menopause

During menopause, the risk of fat gain increases and weight gain may intensify.[24]. Despite the beneficial effects of menopausal hormone therapy on fat distribution, it should not be recommended for the treatment of abdominal obesity. Few studies have shown that behavioral intervention is effective in preventing weight gain for 5 years in perimenopausal women. Further research is needed to determine the most effective methods to prevent the development of obesity associated with menopause [25].

Secondary prevention of obesity

Secondary prevention targets individuals who are already overweight or obese, aiming to screen them and prevent additional weight gain before the development of significant complications or obesity-related functional limitations. There is evidence that lifestyle interventions, including diet, physical activity, and behavioral components, can promote clinically meaningful weight loss (5-10% of initial body weight) and produce beneficial effects on cardiometabolic risk factors in overweight and obese adults. While obesity is strongly linked to health issues and reduced longevity, individuals with the same body mass index can have vastly different health risks. Some obese patients may not have yet developed typical complications like hypertension, abnormal cholesterol levels, orthopedic problems, or type 2 diabetes, as the pace of their development depends on other factors as well. Research indicates that in approximately 40% of individuals, an elevated body mass index is not associated with obesity-related health issues, leading to the suggestion that these persons be

classified as "metabolically healthy." However, the lack of observable obesity-related complications does not necessarily indicate their future absence. Additionally, many such complications can develop without obvious symptoms, making regular check-ups crucial for their early identification [26] [27] [28]. A combination of dietary changes, physical activity, and behavioral modification has been the mainstay of obesity management [1] [29].

Self-assessment of body mass

One of the key issues in the prevention (both primary and secondary) of obesity is regular monitoring and early recognition of excessive body weight. Regular weight assessments of patients in primary care settings are crucial for early obesity prevention. This allows for timely interventions in response to weight gain and helps make patients aware of potential health risks associated with further weight increases, even at the overweight stage. Observational studies have shown that individuals who regularly monitor their weight are less likely to experience weight gain [30]. Additionally, frequent weighing is associated with a greater probability of achieving weight reduction and sustaining a lower body weight. For obese patients, regular weight assessments can be a source of stress and frustration, potentially leading to increased food intake as a way to alleviate this tension. Therefore, weight management should be approached individually, in close collaboration with the patient [31].

The role of doctors in obesity prevention

Healthcare professionals can play a key role in primary prevention of obesity by discussing obesity prevention approaches with patients and emphasizing the importance of taking action to lose weight even at the early stages of being overweight. However, the impact of these efforts may be challenging to quantify, as the benefits may only become apparent over an extended period of time. For overweight patients, healthcare providers should proactively discuss the potential health risks associated with excess weight, even if the patient has not yet developed overt obesity or related complications. On the other hand, in patients who have obesity, the doctor should look for its causes and consider taking tailored measures, including recommending nutritional treatment and specific forms of physical activity, and referring the patient to a nutritionist or obesity treatment center. Adopting healthy lifestyle habits requires the collaborative support of a nutritionist, physiotherapist, and potentially a psychologist - secondary prevention is a multidisciplinary effort. The doctor's primary responsibility is to

coordinate the multidisciplinary approach, closely monitor the effectiveness of the management plan, and determine if pharmacological or surgical interventions for obesity are appropriate for the individual patient.

Summary

Obesity prevention is a crucial concern due to the significant rise in both the prevalence of obesity and the average body weights of individuals in Poland over the past decade. Preventing obesity and its health consequences is an important public health goal. Most interventions address nutrition and physical activity, but many other factors that indirectly affect weight regulation can also be modified by taking care of: adequate quality and length of sleep, limiting stressful situations, proper composition of the intestinal microbiota (through a healthy diet and responsible use of antibiotics), and the choice of medications that do not promote weight gain when pharmacotherapy is necessary for the treatment of chronic diseases. Health education on healthy eating is necessary. Another important activity in the primary prevention of obesity is also the training of medical personnel for dietary counseling, with particular emphasis on the prevention of childhood obesity and adolescent obesity. At the same time, in patients already affected by obesity, an appropriate therapeutic approach is necessary, involving dietary changes, increased physical activity, and behavioral therapy, which can contribute to significant long-term weight reduction and improvement in obesity-related diseases.

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Statement of the authors' contribution

Aleksandra Kiełczewska: Conceptualization, Writing-rough preparation

Grzegorz Szcześniak: Methodology, Investigation Resources

Anna Kiełczewska: Formal analysis, Visualisation, Writing-review and editing

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