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LONG-TERM CONSEQUENCES OF CHILDHOOD AND ADOLESCENT OBESITY ON PHYSICAL AND MENTAL HEALTH: IMPLICATIONS FOR ADULT LIFE. IMPORTANCE OF PREVENTION

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ABSTRACT

Obesity among children and adolescents has become a global problem. In recent years, the number of children with excess body weight has increased. Obesity among children often persists into adulthood, consequently contributing remarkably to an increase in the incidence of many diseases. The aim of this study is to conduct a comprehensive review of literature on obesity among adults and adolescents, focused on identifying the major side effects of childhood obesity on future adult life and importance of prevention. A review of the literature available in the "PubMed" database and books was conducted. Childhood obesity may have a significant impact not only on its side effects in the early age, but may also increase the risk of developing many chronic diseases in the future. It has been shown that childhood obesity may have an important impact on the development of cardiovascular, metabolic, oncological and mental health diseases. These diseases usually do not appear at a young age, but the processes leading to their development may be initiated already in the early years of life. Due to numerous unfortunate implications in both childhood and adult life, it is crucial to prevent obesity from an early age of life, which will subsequently help to avoid many diseases in the future. Teaching children and adolescents appropriate lifestyle habits, such as healthy diet and physical activity, is very important. In order to effectively avoid the complications of obesity, new strategies and solutions should be sought to help and protect children against this serious disease.

KEYWORDS

Childhood Obesity, Adolescent Obesity, Adult Obesity, Risk Factors, Morbidity, Childhood Obesity Prevention

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Introduction.

Obesity is a condition characterized by an excess accumulation of body fat. It is also widespread, significant and chronic disease, which affects both adults and children. The (CDC) Centres for Disease Control and Prevention defines obesity as body mass index (BMI) that exceeds 30 kg/m2 for adults. Over the last decades, the obesity has spread drastically and it is currently considered to be a worldwide epidemic. According to the World Health Organization over the 40 years the number of adults suffering from obesity had doubled and the number of adolescents had quadrupled. Currently the problem of obesity affects 890 million adults and 160 million non-adults in age 5-19 years (Tutor i in., 2023). Unfortunately obesity in childhood and adolescents tends to persist into adulthood (Kartiosuo i in., 2019). Therefore, it became a principal, public health problem of the 21st century, leading to further comorbidities, such as cancers, metabolic syndrome, cardiovascular diseases, mental health disorders and higher morbidity (Kartiosuo i in., 2019; Safaei i in., 2021). The aim of this study is to conduct a comprehensive review of literature on obesity among adults and adolescents, focused on identifying the major side effects of adolescent obesity on future adult life and importance of prevention.

Methodology.

A comprehensive review of literature available in the PubMed database was undertaken. This involved querying the database using key terms such as: childhood obesity; adolescent obesity; adult obesity, risk factors; morbidity; childhood obesity prevention. The gathered data was meticulously examined and analysed.

Results.

Obesity-related health problems can begin as early as childhood. Research shows that over half of children and adolescents who are obese have at least one cardiovascular risk factor or clinical marker, and a quarter have two or more. Additionally, many obese teenagers continue to struggle with obesity into adulthood, which can lead to higher risk of developing cardiovascular and metabolic disorders, cancers and mental health problems (Weihrauch-Blüher & Wiegand, 2018).

Childhood Obesity and Cancer Risk.

It has been shown that there are numerous environmental, exogenous and endogenous factors, which can lead to development of cancer (Lewandowska i in., 2019). There are many hypotheses suggesting the impact of the chronic low-grade inflammation, growth factors, steroid hormones, oxidative stress, and an altered microbiome on cancer development in obesity (Berger, 2014; Ackerman i in., 2017; Himbert i in., 2017). Processes, which are responsible for chronic subclinical inflammation, may start even in prenatal time, when placental inflammation, intrauterine growth retardation and an altered microbiome occurs. Potential risk factors causing chronic inflammation may occur also in postnatal life, including overfeeding and impairment of metabolism (Singer & Lumeng, 2017). These processes in obese children may cause a chronic inflammation, which can affect the processes of carcinogenesis in later life.

Researches conducted by The World Cancer Research Fund (WCRF) revealed s strong evidence that overweight and obesity among adults may lead to at least thirteen types of cancer, such as bowel, post-menopausal, gallbladder, kidney, liver, mouth/pharynx/larynx, oesophagus, ovary, pancreas, prostate, stomach and womb cancers (Malcomson i in., 2023). Similar correlation was also demonstrated in the group of adolescents. In Israel 2,3 million female and male adolescents ranging from 16 to 19 years of age, were regularly examined and followed-up throughout a period of 45 years. The study revealed that adolescents with a higher body mass indexes may suffer from leukaemia (Shamriz i in., 2017), Non-Hodgkin lymphoma (Leiba i in., 2016), pancreatic cancer (Levi i in., 2012), colorectal cancer (Levi i in., 2011), renal cell carcinoma (A. Leiba i in., 2013) and and gastroesophageal carcinoma in adult life (Levi i in., 2013) . Another similar research with a follow-up period of 50 years also demonstrated a relationship between an increased body mass index in the late childhood (8-14 years) and higher cancer risk in the adulthood, especially smoking-related cancers. The same correlation was not shown in the group of obese children in the early childhood (2-8 years) (Jeffreys i in., 2004).

Childhood Obesity and the Risk of Cardiovascular and Metabolic Diseases.

Obesity is associated with a higher risk of incidence and an earlier onset of cardiovascular and metabolic diseases, such as hypertension, dyslipidaemia, non-alcoholic fatty-liver, hyperuricemia, hyperinsulinemia or insulin resistance (Wiegand i in., 2010; Zimmet i in., 2007; Blüher i in., 2013; Bjerregaard i in., 2018; Baker i in., 2007). Chronic inflammation and hormonal disorders accompanying obesity, even in children, may already cause vascular changes, which subsequently may result in earlier atherosclerosis and earlier occurrence of cardiovascular diseases in adulthood (McPhee i in., 2020). Atherogenesis, which leads to atherosclerosis, is a process that occurs from an early age (Berenson i in., 1992). Obesity further accelerates this process. This means that adolescents with other, numerous risk factors may develop cardiovascular disease even before the age of 50 (Morrison i in., 2007). It was also shown that increased total cholesterol levels in childhood were positively correlated with carotid intima media thickness in adulthood (Mahoney i in., 1996; Davis i in., 2001). Moreover, it has been proven that obesity may increase the risk of stroke and myocardial infarction (Zou i in., 2021; Drozdz i in., 2021). This correlation regarding obesity and the occurrence of coronary heart diseases has been especially noticeable in boys, however it increases with the age in both genders (Baker i in., 2007).These are the mainly diseases that tend to appear later in life, nevertheless it is evident that the processes leading to these serious conditions may begin already in childhood (Drozdz i in., 2021).

Furthermore, the relationship between obesity and hypertension was noticed. Obese people are more likely to develop hypertension regardless of gender and age (Muntner i in., 2004; Cheung i in., 2017; Koebnick i in., 2013). It was noticed that 30% of children with obesity are exposed to increased blood pressure, compared to the 5% of children with normal body weight (Drozdz i in., 2021).

Moreover, obesity may also lead to insulin metabolism disorders. Constant, excessive food intake may lead to ectopic deposition of lipids. It may result in an impaired insulin signalling, thus contributing to the development of insulin resistance (Samuel & Shulman, 2012). It was noted that the risk of developing type 2 diabetes increases dramatically when the onset of obesity occurs around age 7, before puberty, even if body weight was normal before. Additionally, it was shown that for each 2-year period of obesity duration, the risk of type 2 diabetes mellitus may increase by up to 14%. Nevertheless, the risk of type 2 diabetes can be significantly reduced by even minimal weight loss before puberty begins (Weihrauch-Blüher i in., 2019). Interestingly, it was observed that the incidence of type 2 diabetes in children who managed to lose weight is comparable to children who were never obese (Juonala i in., 2011).

Childhood obesity and Risk of Mental Health Disorders.

In addition to the negative cardiovascular, metabolic and oncological effects, obese children are at increased risk of mental health disorders. Compared to children with normal weight, obese children have a significantly higher risk of experiencing low self-esteem and developing depressive syndromes in adulthood (Mühlig i in., 2016).

Children, who are overweight or obese often exhibit disordered eating behaviours, which can significantly raise their risk of developing eating disorders later in life. Additionally, a significant number of adolescents who suffer from restrictive eating disorders have a history of being overweight or obese during childhood. This highlights the complex relationship between weight status and the development of eating disorders, underscoring the importance of early intervention and support for children struggling with weight-related issues (Lebow i in., 2015).

Prevention.

Prevention of obesity in children and adolescents has a great importance and should be implemented as early as possible, as it has been shown that childhood obesity persists into adulthood (Kartiosuo i in., 2019). Obesity has many adverse side effects and leads to numerous comorbidities in the future. It has been shown that obesity prevention brings much better results and also reduces the treatment costs of such patients in the future (Barlow, 2007). The basis of obesity prevention is maintaining proper eating habits and physical activity. The supporting environment plays a very crucial role, which is why families and friends should be involved in this process. Such approach makes it easier for the children to learn proper lifestyle habits and increases the probability of patient compliance (Styne i in., 2017). The role of parents is to maintain a supportive attitude and good relationship with the child, which is a promising way to prevent obesity and also it supports the child in learning healthy behaviours (Anderson & Keim, 2016).

Role of Physical Activity.

Weight loss is determined by the difference in the amount of energy expended compared to the energy consumed, therefore physical activity is an important component in maintaining proper body weight (Thomas i in., 2012). Experts have looked into how much physical activity is needed to stop gaining weight. According to the American College of Sports Medicine (ACSM), aiming for 150 to 250 minutes of moderate to vigorous physical activity per week may help to prevent gaining excess body weight (Donnelly i in., 2009). It is also very important to encourage children to participate in physical education classes. It has been shown that the mandatory attendance of such 2 hour classes may reduce body weight and improve muscle endurance (Bao i in., 2020). Sedentary activities such as watching TV and playing computer games should also be limited (Kumar & Kelly, 2017).

Role of Diet.

Diet has a great impact on maintaining appropriate body weight. According to experts' recommendations, children's diet should consist wide variety of vegetables and fruits, multigrain products, unsaturated fats and an appropriate amount of proteins. It is equally important to limit processed foods, including saturated fats, simple sugars and salt. The appropriate caloric content should also be maintained depending on the child's age (Phillips, 2021).

Discussion.

Obesity during childhood and adolescence is a critical public health problem. It affects not only physical but also mental health. Research indicates that obesity-related health risks can manifest early in life, and these risks often persist into adulthood, leading to severe long-term consequences. This is particularly troubling as obesity is strongly linked to numerous chronic diseases, including cardiovascular diseases, cancers, metabolic disorders, and mental health issues. The findings suggest that obesity is not just a concern for the present but a precursor to life-long health challenges. Moreover obesity has huge negative impact on mental health. It can lead to developing low self-esteem, depression, and eating disorders. All this indicates how important it is to prevent obesity already among the youngest. Maintaining a proper diet full of healthy fats, fruits, vegetables and proteins, as well as being active is key to preventing the population from developing many lifestyle diseases.

Conclusions.

Nowadays obesity is one of the major challenges of the public health. The number of people suffering from obesity is constantly growing and increasingly younger people struggle with their body weight due to changing lifestyle. The relationship between childhood obesity and increased morbidity and mortality in adulthood is not yet fully understood, however the evidence suggests that an increased body weight in childhood may negatively impact adult life, especially since overweight and obesity among children and adolescents tends to persist until adulthood. Maintaining a proper body weight, especially after puberty, can reduce the risk of cancer, cardiovascular, metabolic diseases and mental health disorders, which will have a positive impact on the quality of life in the future. In the upcoming years more researches, particularly those with long period of follow-up, have to be performed in order to better understand the direct correlation between excess body weight in children and adolescents and its effects in the future. It is significant to focus on finding successful strategies, which should be implemented to prevent and protect children and adolescents from obesity, which nowadays has become a global pandemic.

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