

Childhood Obesity - A Pandemic and Global Health Crisis

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Abstract

Children and adolescents are most likely to suffer from pediatric obesity or childhood obesity. The prevalence of obesity among adults is approximately 43 million, while the prevalence of overweight and abdominal obesity among children and adolescents is 21 - 24%. Specific ethnic groups have the highest prevalence of obesity. Children and adults who are obese are more likely to suffer from heart disease. Among adults, obesity causes hypertension, hyperlipidemia, liver and kidney diseases, and insulin resistance in children and adolescents. The developed world faces a major health concern when it comes to obesity among children. Obesity has been reported to be increasing in males and females of all pediatric ages, as well as across racial and ethnic groups. Obesity is influenced by a variety of factors, including eating habits, genetics, environment, metabolism, and lifestyle. Less than 10% of obesity cases are genetic or hormonal, with over 90% being idiopathic. A person becomes obese when they consume more calories than they burn, which is usually due to overeating and not exercising enough. Breathing disorders, sleep apnea, chronic obstructive pulmonary disease, cancers such as prostate, bowel, breast and uterine, heart disease, diabetes (type 2 in children), depression, liver and gallbladder problems, gastro-esophageal reflux disease, high blood pressure, high cholesterol, stroke, and joint diseases such as osteoarthritis, knee pain, and low back pain are some of the symptoms of obesity. Pediatric obesity is influenced by environmental factors, behavioral factors, such as convenience food consumption, genetic factors, and family factors. Increasing physical activity and reducing calorie intake can help combat obesity. Weight is influenced by endogenous molecules such as leptin, mitochondrial uncoupling proteins, and hypothalamic melanocortin 4 receptors. Molecular targets such as these are potentially useful for pharmacologically manipulating obesity. Compared to a placebo, sibutramine and orlistat produce modest weight loss, ranging from 3 to 8% in adults with obesity. Insulin resistance and hyperinsulinemia are treated with metformin in children and adolescents. Hypothalamic obesity is treated with octreotide. Severe childhood obesity is treated with bariatric surgery. Pediatric obesity is described in the present review in terms of its causes, symptoms, prevention, and treatment.

Keywords: Children, Adolescents, Pediatric obesity

Introduction

There are alarmingly high levels of childhood obesity in low-

income and middle-income countries, and the prevalence is rising worldwide. A global estimate of 68 million overweight children under 5 years of age was made in 2022, 54 million of whom lived in developing countries. Children in the majority of countries are not recognized as obese despite obesity being declared a disease by the World Health Organization and the American Medical Association [1].

Scientists and clinicians have been expressing concerns regarding potential stigmatization risks associated with 'medicating' obesity in children. Additionally, the intensity and seriousness of obesity have been 'upgraded' to the status of disease, which has led to a demand for pharmacological and surgical interventions. Since obesity in childhood is not necessarily associated with co-morbidities that demand immediate medical attention, many people view it as a risk factor or medical condition, not a disease. Medical conditions are nonspecific terms that can refer to general health conditions (such as pregnancy or hair loss) that may affect how health care is provided. A defective state of health can also be defined as such. In situations where a stronger, more direct term may not be appropriate, a condition that indicates a pathology may be used as a neutral term. An illness-causing condition can be classified as a disease when such reasoning does not apply [2].

Implications of Defining Childhood Obesity as a Disease

Some people argue against defining a condition as a disease because they will not suffer from any medical complications in their lifetimes if they meet the definition. The same can be said for a variety of conditions, but it is especially valid when it comes to childhood obesity. There is a strong association between childhood obesity and adult mortality and morbidity. Long-term obesity exposure also increases the risk of chronic noncommunicable diseases and their co-morbidities. Children and adolescents who are obese at a young age usually become obese adults, so most of these individuals will have a significant lifelong exposure to obesity. Adult obesity is defined as a disease while childhood obesity is not, despite the longer exposure time suggesting that young people have a greater risk of co-morbidities than adults [3].

A simplistic and somewhat naive view of obesity is that it is simply a normal response of the child's body to the environment, and that the interface between the two should be the main focus of intervention. A complete understanding of the pathophysiology of childhood obesity (or adult obesity) is lacking, and obesogenic environments have been criticized as the main cause of obesity [4-6]. It remains enigmatic how



obesity develops at the population level, when body weight is tightly regulated under presumably understood physiological mechanisms. Since this discrepancy exists, scientists who are focused on population-based obesity prevention/interventional approaches would be likely to neglect obese children who are sowing the seeds of obesity-related health problems in the near future. Some obese children may already exhibit early biomarkers of co-morbidities despite being clinically silent. There are also reasons to suggest that more 'biological' explanations (not only environmental exposures) may have a significant role in the development of this disease, including intra-uterine exposure and early nutrition and the microbiome during childhood and infancy [7]. It should also be noted that obesity in childhood increases the risk of developing type 2 diabetes, hypertension, dyslipidemia, and cardiovascular disease in adulthood. Conversely, obese children who become non-obese in adulthood have similar risks of these outcomes as non-obese individuals. Childhood obesity should be prevented and addressed as early in a child's life as possible based on these findings [3, 8].

It is indeed the 'why' that is at the core of the debate as to whether childhood obesity should be defined as a disease. A definition such as this has multiple implications for society and the health care system, as well as for individuals. It also imposes a major financial burden on health care and the broader economy. Firstly, and most importantly, the modality of disease prevention is used for diseases, and not for conditions. Prevention of obesity is well established to be more effective and less expensive than addressing it, as it is with several other noncommunicable diseases. If obesity in childhood is clearly defined as a disease rather than a condition, it can be directly communicated to stakeholders who can address it (whether at a societal or individual level). According to estimates, obesity is responsible for 21% of all medical spending in the United States (USD 412 billion by 2023). Several key stakeholders seem motivated to act based on data on obesity and co-morbidity treatment costs and their future financial implications [9-11].

It remains true, however, that preventing or fighting a disease, rather than simply addressing its financial implications, makes such efforts more morally and scientifically justified. Taking care of patients with chronic diseases such as diabetes or asthma is the responsibility of health care professionals. In children, obesity is not usually a cause for seeking medical attention. Commonly, care providers conveniently avoid or fail to detect obesity in their patients, making it difficult to raise and discuss the issue with parents and children [12,13]. Additionally, obesity treatment does not have a 'silver bullet' solution like other acute diseases encountered in pediatric practice. A team of specialists must devote a significant amount of time and effort to pediatric obesity treatment, and the outcomes may sometimes be satisfactory or may fluctuate throughout the treatment period and, in many instances, result in significant failure [14]. In children, physical activity has been shown to reduce body fat percentages, but its effects on other measures of adiposity are inconsistent. Studies have shown that lifestyle interventions can improve measures of adiposity and cardiometabolic health in childhood obese people [15]. While interventions should be tailored to the specific needs and cultural characteristics of target populations, the optimal duration and intensity of exposure, as well as the need for long-term 'booster' modalities, should be determined based on the populations' needs and cultural characteristics [16, 17].

Health care providers often recommend lifestyle modifications to adults with hypertension or type 2 diabetes as a first line approach, but a similar strategy for children with obesity is rarely implemented. In order to facilitate early preventive, diagnostic, and treatment modalities that are feasible even in busy clinical practices, it may be

useful to define obesity in childhood as a disease and mandate that it be addressed intentionally rather than waiting until medical complications are diagnosed or for parents to raise the issue [18, 19]. The prevention of overt clinical morbidity may be achieved by seeking subclinical complications of a disease usually present in obese children. With regard to indications for intervention, it may be important to consider the severity of the disease (mild vs severe obesity, presence/absence of related complications). It may appear that most obese children are healthy, but they suffer from greater medical complications when they are severely obese. The metabolic impact of obesity can already be seen in children and adolescents with mild degrees of obesity in some cases, despite simplistic body mass index (BMI) cut-offs [20].

There has been a lack of recognition and financial resources for obesity in children, which has limited the development and dissemination of novel treatment modalities. It is particularly pertinent because lifestyle interventions (physical activity, diet, and behavioral approaches) have modest long-term benefits for obesity and obesity-related co-morbidities in childhood. Based on these observations, it is critical to reevaluate the currently employed fewer effective approaches and to adapt and disseminate the key elements of successful programs. For obese children and their families, affordability is obviously a key factor. Currently, childhood obesity is not treated with safe and effective long-term pharmacological interventions. There will be further questions regarding the indications for such medications if they prove to be safe and effective over standard conservative measures. As traditional interventions in 'super-obese' adolescents have modest success rates, bariatric surgery may be a rational approach until other effective strategies are discovered [21]. Despite their short-term impressive effectiveness, bariatric procedures in adolescents have yet to be proven to have long-term medical outcomes, and it is still unclear which individuals will benefit most from these procedures. Therefore, this drastic intervention should only be performed on a small minority of severely obese individuals and does not offer a relevant solution for the majority of obese children (Figure 1).

As a result of declaring childhood obesity a disease, there will be a significant increase in health care costs and an increase in new patients [22]. The development and training of multidisciplinary teams of health care professionals, as well as the allocation of related financial resources, will be necessary. Multidisciplinary interventions for obese children and their families will have to be covered by health insurance organizations. Inflammatory bowel disease and type 1 diabetes were among the chronic diseases for which this care was reserved until now [23]. A trained multidisciplinary team should deliver physical, psychological, and behavioral therapies in order to manage childhood obesity. Children with obesity can also be treated in primary care by transferring hospital-based care. Childhood obesity has been recognized as a chronic disease in few developed nations, such as Switzerland and the United Kingdom, which have developed and disseminated multidisciplinary therapeutic programs [3, 24].

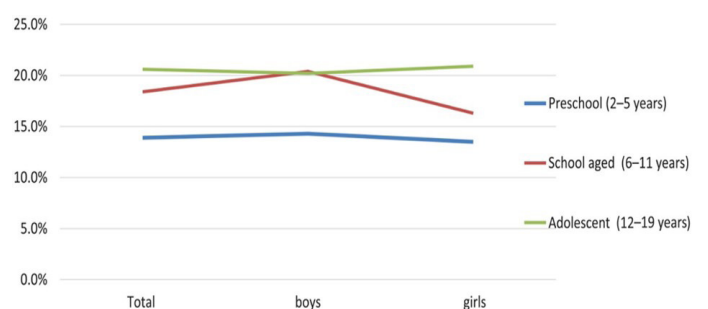


Figure 1: Childhood and adolescent obesity prevalence, by age and sex [22].



There are several concerns that may arise when childhood obesity is recognized as a disease. This statement aims to address the problem of insufficient effective treatment and inadequate health care systems [25]. Developing and studying such interventions and systems should be based on recognizing the seriousness of childhood obesity and its long- and short-term health implications. Childhood diseases like diabetes, which are well recognized and treated in a timely manner, are significantly lagging behind. There is a risk of ignoring the seriousness and implications of obesity in children, which should be weighed against the risk of stigmatizing them [26].

Does Childhood Obesity Meet the Definition of a Disease?

In recent years, there has been an evolution in how and why to define a condition as a disease. Practically, such definitions can be divided into the semantic element and the purpose/implication of the definition (the 'what' and 'why'). A semantic element is associated with descriptive components of the condition, while a purpose/implication is associated with the motivations of the definition's creators. A semantic argument (or what) about childhood obesity, in general, is simple to address. In accordance with the Oxford medical dictionary, a disease is defined as follows: A disorder that has a specific cause (which might or might not be known) and recognizable signs and symptoms; any bodily abnormality or failure to function properly, except those directly caused by physical injury (the latter, however, might open the door to disease) [27].

Some of the causes of obesity have been clearly identified, such as genetics, an increase in food availability, and a decrease in physical activity. 'Environmental factors' do indeed contribute to obesity. The prevalence of obesity increases when predisposed populations are exposed to obesity-promoting environments. The effect of certain environmental exposures, such as dietary modifications, may be reversible in some cases. The gastrointestinal microbiome may also contribute to obesity, as it has also been shown to have major effects on whole body metabolism and obesity development. Overweight may be caused by genetic anomalies or other inherent defects in the body. A very small fraction of severe obesity is caused by monogenic causes, such as leptin receptor deficiency and extremely high BMIs. There is only a modest explanation of BMI in several populations for genome-wide association studies and single nucleotide polymorphisms. However, these variations may interact strongly with specific environmental factors and perhaps biological influences, emphasizing how these factors interact in many ways [28, 29].

In medical nomenclature, obesity is defined by its signs and symptoms. It seems problematic to some to define obesity based on its anthropometric values (such as BMI, waist circumference, or percent body fat), yet it is the same for multiple conditions. Hypertension, for example, is defined by statistically derived extremes of population values and risk prediction based on longitudinal calculations [30]. The most important factor to note, like obesity, is that hypertensive subjects may not experience any clinical symptoms or medical complications in the long run. Treatment interventions are guided by the numerical values of blood pressure, which are the only defining features of the disease. Similarly, obesity in childhood is significantly associated with mortality and morbidity in adulthood, even in the absence of overt complications.

There is indeed an association between childhood obesity and bodily abnormalities and dysfunctions. Childhood obesity is associated with tissue-specific insulin resistance, increased mechanical stress on joints, and impaired cardiovascular function, but not always. Among

the manifestations are abnormal glucose tolerance, dyslipidemia, several types of hypertension, orthopedic complications, and early atherosclerosis. In addition to reducing quality of life, childhood obesity reduces a child's social function [31, 32].

Obesity is, therefore, defined as a disease in every sense of the word by the dictionary. Chronic diseases last for 3 months or longer, cannot be prevented by vaccines or cured by medications, and do not just disappear. Furthermore, chronic diseases are those that persist for a long time or recur frequently. Children who are obese suffer from chronic diseases, not just a disease [33, 34].

Conclusion

A major health challenge of the 21st century is childhood obesity. In order to increase individual and societal awareness and to improve the care of obese children worldwide, we need to view it as a chronic disease. In order to prevent the escalation of obesity into significant clinical and psychosocial problems, obesity should be treated early before co-morbid conditions develop. The percentage of overweight or obese children in developed nations varies from 19 to 49% for boys and 18 to 43% for girls. Nearly 12 - 16 million overweight youth receive inadequate treatment, which represents approximately 12 - 16 million people. UNICEF's Convention on the Rights of the Child states that this is unacceptable, since all children should have access to medical care at all times. It is understood that States Parties recognize that children are entitled to the highest attainable standard of health as well as facilities for treating illnesses and rehabilitating their health. Children have the right to such health care services, and States Parties shall strive to ensure that they are not deprived of them.

Childhood obesity will therefore be recognized as a chronic disease that can be prevented and treated at the societal and individual level by novel interventions and policies. Children's obesity will be addressed more seriously by both families and physicians as a result of this initiative. Childhood provides a unique chance to influence the quality of life, health, and prevention of disabilities for a lifetime. As with other chronic diseases of childhood, health care systems must be adapted to treat obese children. These issues will be addressed in our upcoming research and reviews by engaging health care workers in educational activities, identifying research agendas in this much needed field, and establishing collaborations among clinicians, researchers, health institutions, organizations, and states across developed nations.

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Conflict of Interest

None.

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