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## Clinical Information

# Childhood Obesity Is a Chronic Disease Demanding Specific Health Care – a Position Statement from the Childhood Obesity Task Force (COTF) of the European Association for the Study of Obesity (EASO)

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## Key Words

Obesity · Child · Adolescent · Non-communicable chronic disease · Morbidity · Classification · Treatment, · Policy · Health systems

## Abstract

Childhood obesity is one of the greatest health challenges of the 21st century. The EASO COTF is convinced that classifying obesity as a chronic disease in children and adolescents is a crucial step for increasing individual and societal awareness, and for improving early diagnosis and intervention. Such a classification will enhance the development of novel preventive and treatment approaches, health care policies and systems, and the education of healthcare workers. The management of obesity prior to the appearance of co-morbidities may prevent their escalation into significant medical and psychosocial problems, and reduce their economic and societal impact. Childhood is a unique window of opportunity to influence lifetime effects on health, quality of life, prevention of non-communicable chronic diseases and dis-

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abilities. The Convention on the Rights of the Child by UNICEF states that parties shall strive to ensure that no child is deprived of his or her right of access to health care services. The EASO COTF is aiming to address these issues via educational activities for health care workers, identification of research agendas, and the promotion of collaborations among clinicians, researchers, health institutions, organizations and states across Europe.

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## Introduction

The prevalence of childhood obesity has now reached alarming and concerning levels across the world and seems to be rising in low-income and middle-income countries. In 2014, the global number of overweight children under the age of 5 years was estimated to be over 42 million, 31 million of them living in developing countries [1]. Despite obesity being declared by the World Health Organization (1979) and by the American Medical Association (2013) as a disease, it is not recognized as such in children in the majority of countries.

'Medicalization' of obesity in children has been raising concerns and debate among scientists and clinicians regarding the potential risks of stigmatization of the obese child [2]. Moreover, there is an increased demand for pharmacological and surgical interventions [3] for obesity in general [4] and in childhood [5] in particular since its severity and seriousness have been 'upgraded' to the status of 'disease' [6]. Obesity in childhood is often considered by many as a risk factor or medical condition and not a disease, because it is not necessarily associated with co-morbidities that should be addressed by an immediate medical intervention. A medical condition is indeed a nonspecific term, often used in relation to states of normal health that may have implications for the provision of health care (such as pregnancy or hair loss). It may also be defined as 'a defective state of health'. A condition that indicates the presence of a pathology is sometimes used as a neutral term when a stronger more direct term may not be warranted. When such reasoning does not come into play, a condition conferring illness can be classified as a disease.

## Does Childhood Obesity Meet the Definition of a Disease?

The question whether and why to define a condition as a disease has multiple philosophical facets and has been evolving in recent years. From a more practical point of view, such definition can be divided to the semantic element and the purpose/implication of the definition (the 'what' and the 'why'). The semantic element is related to the descriptive components of the condition while the purpose/implications are associated with the motives that drove the composers of the definition. When it comes to obesity in general and specifically in childhood, the semantic argument (or the *what*) is simple to address. The definition of a disease as taken from the Oxford medical dictionary is: 'A disorder with a specific cause (which may or may not be known) and recognizable signs and symptoms; any bodily abnormality or failure to function properly, except that resulting directly from physical injury (the latter, however, may open the way for disease)'.

Obesity has multiple established specific causes, some being clearly identified such as a genetic component, increased availability of food supply, or reduction of physical activity. Obesity is indeed 'a response to environmental factors'. Multiple studies have shown that exposure of a predisposed population to an obesity-promoting environment results in increased prevalence of obesity [7, 8]. Moreover, this effect is in some cases reversible upon modification of specific environmental exposures such as dietary modifications [9]. Another

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potential factor that may contribute to the development of obesity is the gastrointestinal microbiome which has also been shown to have potential major effects on whole body metabolism and development of obesity [10, 11]. In some cases, overweight may be due to inherent defects of the organism such as genetic anomalies. Monogenic causes of obesity are usually manifested by extremely high BMIs and include leptin receptor deficiency; however, such etiology account for a very small fraction of severe obesity in the population [12]. Genome-wide association studies and single nucleotide polymorphisms (SNPs) only explain a modest part of the BMI in several populations [13], yet these variations may have strong interactions with specific environmental and perhaps biological exposures [14], emphasizing the multitude of interactions of these factors.

Obesity has recognizable signs and symptoms: the circular logic of defining obesity by its signs of elevated anthropometric values (such as BMI, waist circumference, or percent of body fat) seems problematic to some yet is shared by multiple conditions in the medical nomenclature. For example, hypertension is defined by statistically derived extremes of the distribution of values in the population tied to longitudinal calculations of risk prediction of such values. Importantly and similar to obesity, hypertensive subjects may have no clinical symptoms, and some may not suffer from any medical complication over time. In this case, the numerical value of blood pressure is the only defining feature of the disease and serves as a target for treatment interventions. Similarly, obesity in childhood, even without the presence of overt complications, has been shown to be a significant predictor of future morbidity and mortality in adulthood [15].

Childhood obesity is indeed associated with bodily abnormalities and failures to function properly [16]. Some but not all cases of childhood obesity are characterized by increased tendency towards tissue-specific resistance to the actions of insulin [17], increased mechanical stress on joints [18], and impaired cardiovascular function [19]. These may manifest as abnormal glucose tolerance, dyslipidemia, varying degrees of hypertension, orthopedic complications, and the presence of early atherogenesis. Importantly, childhood obesity is commonly associated with a reduced quality of life and impaired social functioning of the child [20].

Thus, obesity in childhood or adulthood fulfills the dictionary definition of a disease to its fullest. According to the US National Center for Health Statistics, a chronic disease is one lasting 3 months or more, cannot be prevented by vaccines or cured by medications, nor does it just disappear. In addition, a disease can be considered as a chronic if it is an illness persisting for a long time or constantly recurring. Thus childhood obesity is not simply a disease; rather it is a chronic disease.

### Implications of Defining Childhood Obesity as a Disease

The common counter-argument for defining a condition as a disease is the fact that some individuals who meet the definition will not suffer any medical complication in their lifetime. While this is true for multiple conditions, this is specifically relevant for the question of childhood obesity. Indeed, obesity in childhood has been shown to have a strong association with adult mortality and morbidity [15, 21]. The length of exposure to obesity is also associated with the risk of developing related co-morbidities over time, in particular non-communicable chronic diseases (NCDs) [22]. As childhood obesity has a strong tendency to track into adulthood, it is reasonable to assume that most of obese children and adolescents will become obese adults and will have a significant lifelong exposure [23]. Defining adult obesity as a disease while failing to do so with childhood obesity ignores the length of exposure which actually suggests that many youth have a greater risk of co-morbidities in comparison to those who have developed the condition in adulthood [24, 25].

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The notion that obesity is simply a normal response of the child's body to its surrounding environment and that the interface between the two should be the main target for intervention [3] is simplistic and somewhat naïve. A complete understanding of the pathophysiology of obesity in childhood (or adulthood) is lacking and the evidence of the obesogenic environment as the main cause of the obesity epidemic has been criticized [26]. The disconnection between the development of obesity in an individual (where body weight is tightly regulated under presumably understood physiological mechanisms) and the development of obesity at the population level remains enigmatic [27]. This discrepancy makes scientists who are focusing on population-based preventive/interventional obesity reduction approaches potentially neglect the individual obese child who is sowing the seeds of obesity related co-morbidities in the near future. Importantly, early biomarkers of co-morbidities may already be present in a significant portion of obese children despite being clinically silent [28]. Other factors such as the impact of intra-uterine exposures [29] as well as the role of early nutrition [30] and the microbiome during infancy and early childhood [31] suggest that more 'biological' explanations (and not only environmental exposures) may play a critical role in the development of this disease. Most importantly, the obese child who maintains being obese as an adult has a significantly increased risk for the development of type 2 diabetes, hypertension, dyslipidemia, and cardiovascular disease. In contrast, the risks of these outcomes among overweight or obese children who became non-obese in adulthood are similar to those of persons who were never obese [32]. These observations set a strong rationale for early interventions aimed at preventing and addressing childhood obesity as early as possible in the life course.

The motive for defining childhood obesity as a disease (the 'why') is indeed the main issue in this debate. Such definition has multiple consequences at the societal, health care system and individual levels and induces a major financial burden on health services and on the wider economy. The first and most important implication is that the modality of disease prevention is applied to diseases, and typically not to conditions. Similar to several other NCDs, it is well established that prevention of obesity could be much more effective and less costly than addressing it not until present [33, 34]. The burden of obesity in childhood is much more directly conveyed to stakeholders who are in position to address it (whether at a societal or individual level) when it is clearly defined as a disease rather than a condition. In the USA, estimates have shown that obesity accounted for 21% of all medical spending (USD 190 billion in 2005) [35]. Data regarding the present costs of obesity and co-morbidity treatment and its future financial implications on national health budgets seems to drive key stakeholders to act [36].

Despite this, preventing or fighting a disease, and not just addressing its financial implications, makes such efforts stronger and more justifiable from a moral and scientific point of view. Health care professionals treat patients and their diseases, such as diabetes or asthma. Obesity is typically not a reason to seek medical attention, specifically during childhood. The burden of raising and discussing obesity with the child and family rests upon the care provider who commonly tends to conveniently avoid this issue or fail to detect it [37]. Moreover, unlike typical acute diseases commonly encountered in a pediatric practice, obesity treatment has no 'silver bullet' solution. Pediatric obesity treatment typically requires intensive dedication of time and effort by a team of specialists, and the clinical response may sometimes be satisfactory or may also have a fluctuating course and, in many instances, have a significant failure rate [38–40]. For example, physical activity has been shown to modify body composition by reducing the percent of body fat yet its effect on other measures of adiposity in children is inconsistent [41]. The common wisdom based on current literature is that lifestyle interventions for obesity in childhood can lead to improvements in measures of adiposity and cardio-metabolic outcomes [42]. Interventions should be designed for their target populations, yet

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the optimal length of exposure, the intensity, and the need for long-term ‘booster’ modalities should be tailored to meet the specific needs and cultural characteristics of the population targeted.

Although recommending lifestyle modifications to adults with diseases such as hypertension or type 2 diabetes seems natural and acceptable to health care providers as a first line approach, implementing a similar strategy for children with obesity is less common. Defining obesity in childhood as a disease and mandating that the problem is intentionally addressed, rather than waiting for medical complications to be diagnosed or for the issue to be raised by a parent, may facilitate early preventive, diagnostic and treatment modalities which are feasible even in busy clinical practices [43, 44]. Seeking potential sub-clinical complications of a disease typically present in obese children may promote early diagnosis and intervention, prior to the establishment of an overt clinical morbidity [45]. Similar to other medical conditions, the severity of the disease (mild vs. severe obesity, presence/absence of related complications) may be considered important for decision makers with regard to indications to intervene. While the majority of children who are obese may appear ‘healthy’, those with severe obesity are becoming more frequent and their related medical complications are at much higher rates [46]. However, professionals must be aware that simplistic BMI cut-offs are a poor indicator for the presence of obesity driven co-morbidities and that, in some cases, the metabolic impact of obesity may already appear in children and adolescents with mild degrees of obesity [47].

To date, the development and the dissemination of novel treatment modalities for obesity in children have been limited due to the absence of recognition of the medical problem and the lack of financial resources. This is specifically relevant in view of the modest long-term positive effects of lifestyle interventions (physical activity, diet, and behavioral approaches) on the degree of obesity and the improvement of obesity-related co-morbidities in childhood [39, 43]. These observations call for re-evaluation of the currently used less effective approaches and for adaptation and dissemination of the key elements of success of the programs that have shown promising short- and long-term results. Obviously, one such key is the financial accessibility of the program to the obese children and their families. Effective and safe long-term pharmacological treatments are currently lacking for childhood obesity. If such medications emerge and prove to be safe and more effective than standard conservative measures, further questions will arise regarding the indications for their use in childhood. Until other effective interventions are discovered, utilizing bariatric surgical interventions in adolescents with severe obesity-related complications may be a rational approach as the success rates of traditional interventions in ‘super-obese’ adolescents are very modest. Importantly, while having proven short-term impressive effectiveness, the long-term medical consequences of bariatric procedures in adolescents are unknown, and the selection of suitable patients who will benefit most is still not clear. Thus, this drastic intervention should be reserved to a small minority of severely obese subjects and does not provide a relevant solution for the vast majority of obese children.

Declaring childhood obesity as a disease will create a significant number of new patients to treat and will increase immediate health costs. Developing specific health systems and training health care professionals working as multidisciplinary teams will be needed, as well as allocating related financial resources. For example, health insurance organizations will have to cover the costs of effective multidisciplinary interventions for children who are obese and their families [48]. Up to now, this care was reserved only for children suffering from other chronic diseases such as type 1 diabetes or inflammatory bowel disease. Physical, psychological and behavioral therapies are considered as essential components of childhood obesity management and should be delivered by a trained multidisciplinary team. There is also increasing evidence that hospital-based childhood obesity care can be transferred to

primary care [49]. In Europe, few countries such as Switzerland and the UK have recognized childhood obesity as a chronic disease, and multidisciplinary therapeutic programs have been developed and disseminated at a national level.

Recognizing obesity in childhood as a disease may however raise several concerns. First is the primary aim of this statement – the present lack of general effective treatment and adequate health care systems to address the problem. Recognizing the seriousness of obesity in childhood along with its short- and long-term health implications should drive the development and study of such interventions and systems which is significantly lagging behind more traditional childhood diseases such as diabetes which are recognized and addressed accordingly. The fear of stigmatization of the obese child should be weighed in relation to the risk of ignoring the seriousness of the condition and its health implications.

## Conclusion

Childhood obesity is the one of the greatest health challenges of the 21st century. The EASO COTF is convinced that considering it as a chronic disease is a crucial step for increasing individual and societal awareness as well as for improving the care of obese children worldwide. Treating obesity early prior to the appearance of co-morbidities may prevent its escalation into significant clinical and psychosocial problems. In Europe, 19–49% of boys and 18–43% of girls are overweight or obese [50]. This represents approximately 12–16 million overweight youth, very few of whom receive adequate treatment. According to the Convention on the Rights of the Child (CRC) by the UNICEF, this reality is unacceptable because all children should be able to receive medical care when it is needed: ‘States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services’ [51].

The recognition of childhood obesity as a chronic disease will therefore enhance the development of novel interventions and health policies to prevent and treat obesity at the societal and individual level. It will strongly encourage both families and physicians to address childhood obesity more seriously. Childhood is a unique window of opportunity to have a lifetime impact on health, quality of life, and prevention of disabilities. Health care systems should therefore be adapted, and professionals should be trained to treat obese children, similar to other chronic diseases of childhood. The EASO COTF is aiming to address these issues via educational activities for health care workers, identification of research agendas in this much needed field, and the creation of collaborations of clinicians, researchers, health institutions, organizations and states across Europe.

## Disclosure Statement

All authors declare no conflict of interest.

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