



## Obesity as a Problem in Children and Adolescents: Literature Review

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**ABSTRACT:** Obesity in children and adolescents affects health worldwide and is linked to premature death, comorbidities in the cardiometabolic and psychosocial systems, and other conditions. The problem of obesity in children and adolescents is 10% for children aged 5 to 17 years and 2-3.5% for teenagers, according to the most recent official data. The number of adolescents and children in Indonesia who suffer dietary deficiencies has risen every year. Adolescent obesity is caused by a variety of factors. The effects of childhood obesity can range from psychosocial effects to lifelong clinical changes like hypertension, hypercholesterolemia, metabolic syndrome, orthopedic disorders, obstructive sleep apnea (OSA), asthma, fatty liver disease, and increased risk for cardiovascular disease. Local, regional, and global efforts are encouraged by the World Health Organization's (WHO) strategy on diet, physical activity, and healthier lifestyle.

**KEYWORDS:** Adolescents, Children, Health Problem, Obesity.

### INTRODUCTION

Obesity in children and adolescents is a global health problem with increasing prevalence in low- and middle-income countries and high prevalence in many high-income countries. Obesity in childhood is likely to continue into adulthood and is associated with cardiometabolic and psychosocial comorbidities and premature death. In recent decades, obesity in children and adolescents (2-18 years of age) has emerged as a serious health problem worldwide, including in Asian countries. The effects of obesity are evidenced in three aspects: (1) continued obesity into adulthood (2) increased risk for diseases, such as type 2 diabetes, cardiovascular disease, chronic kidney disease, and cancer; and (3) increased mortality and premature death. Child obesity is related to adult obesity.<sup>1</sup> A meta-analysis showed that obese children have five times the risk of obesity as adults of normal weight. In another study, about 80% of obese adolescents remained obese in adulthood. Childhood obesity affects various aspects of physical and mental health during childhood. <sup>2</sup> Overweight and obesity are chronic conditions that result from an imbalance of energy over a period of time. Energy imbalance occurs when the number of calories consumed does not equal the number of calories the body uses. The cause of this energy imbalance can be due to a combination of several different factors and varies from one person to another. Globally, overweight is fast becoming one of the most important public health problems of our time with an alarming increase in its magnitude among the young population. According to recent statistical data the worldwide rates of overweight and obesity in children aged 5-17 years are 10% and 2-3.5% respectively.<sup>3</sup> In China, along with the rapid increase in overweight and obesity has experienced social, economic, and environmental transition problems. Lifestyle factors such as dietary habits and physical activity have changed drastically. In general, there has been a shift towards a diet with more animal products, refined grains, and highly processed foods, and towards a more sedentary lifestyle. To systematically assess how the dynamics of overweight and obesity are affected by lifestyle changes and more broadly socioeconomic developments in China.<sup>3</sup> Although obesity rates vary between countries, the prevalence has increased over the past 40 years. Since 1980, obesity among children has doubled in more than 70 countries and roughly tripled in some developing countries. The rate of increase in obesity is higher in children than in adults. Moreover, despite the recent high prevalence of adult obesity in high-income countries, the prevalence of childhood obesity continues to increase regardless of sociodemographic stratum. The prevalence of overweight and obesity in children and adolescents is increasing significantly in developed countries; prevalence reached 23.8% for boys and 22.6% for girls in 2013 compared to 16.9% for boys and 16.2% for girls in 1980.<sup>4</sup> In developing countries, the prevalence has also increased from 8.1% in 1980 to 12.9% in 2013 for boys and from 8.4% in 1980 to 13.4% in 2013 for girls. In 2015, 107.7 million children were considered obese worldwide. Although the overall prevalence of childhood obesity in 195 countries was reported at 5% in 2015, the prevalence is higher in countries with higher socioeconomic levels. The prevalence of childhood obesity is more than 10% in developing countries and even higher (>20%) in developed countries. Several Asian countries, such as Vietnam (1.6%) and Bangladesh (1.2%), have relatively low rates of childhood obesity. However, the increase in tariffs did not differ between Asian and Western countries. In addition, in absolute terms, China and India have the



highest number of children with obesity.<sup>4</sup> Children and adolescents with obesity nutritional status in Indonesia have increased the number every year. Factors causing obesity in adolescents are multifactorial. Excessive intake of macronutrients, increased consumption of fast food, lack of physical activity, genetic factors, psychological factors, amount of pocket money, influence of advertising, socioeconomic status, not having breakfast, age, and gender are factors in diet and lifestyle changes. They can cause an energy imbalance resulting in the risk of obesity. The research aims to determine the factors that influence the risk of obesity in adolescents. Adolescents with excessive intake of macronutrients, frequent consumption of fast food, low physical activity, high pocket money and a history of obese parents have a greater risk of developing obesity.<sup>5</sup>

## DISCUSSION

Obesity in children and adolescents contributes to debilitating health including an increased risk of cardiovascular disease and type 2 diabetes. Children 2 years of age and older can be categorized as obese according to their body mass index (BMI), which is a measure for obesity by comparing a person's height and weight compared to other people of the same age and sex. BMI 95th percentile or higher can be considered obese.<sup>6</sup>

The problem of obesity in children and adolescents can have lifelong clinical and psychosocial consequences, including hypertension, hypercholesterolemia, metabolic syndrome, orthopedic disorders, obstructive sleep apnea (OSA), asthma, fatty liver disease, and increased risk for cardiovascular disease.<sup>7</sup> In addition, obesity can cause low self-esteem, poor body image, social isolation, discrimination, and depression among young patients.<sup>8</sup> Obesity among children and adolescents can have the following long-term physiological consequences. (1) Cardiovascular System, obesity is associated with increased adipose tissue, and adiposity is associated with hypertension. Dysfunctional adipocytes and neurohormonal activation of the sympathetic nervous system are key factors in obesity. In addition, an unbalanced diet can lead to hypercholesterolemia and lead to plaque buildup in the arteries, increasing the risk of myocardial infarction or stroke later in life. Similarly, children and adolescents with diabetes, hypothyroidism, and kidney and liver disease are at increased risk of hypercholesterolemia.<sup>9</sup>

(2) Endocrine system. Obesity and a sedentary lifestyle increase an individual's risk for Diabetes Mellitus which affects how the body uses glucose. The prevalence of children and adolescents with diabetes mellitus type 2 continues to increase, which has long-term life-threatening consequences, so children should be monitored and treated for this problem. In addition, children and adolescents who are obese may have other co-morbidities, including impaired glucose tolerance; growth-related disorders and puberty such as accelerated bone age and linear growth; and, in women, hyperandrogenism and early-onset polycystic ovary syndrome.<sup>10</sup>

(3) Metabolic syndrome. The metabolic syndrome describes the following grouping of risk factors for type 2 diabetes mellitus and atherosclerotic cardiovascular disease: central obesity, hyperglycemia, dyslipidemia and hypertension. Obese children are at increased risk for developing metabolic syndrome, which is also associated with insulin resistance characterized by macrophage accumulation and proinflammatory inflammation and is associated with obesity and type 2 Diabetes Mellitus.<sup>11-12</sup>

(4) Dermatological effect. Obesity is associated with a variety of skin conditions including acanthosis nigricans, which is characterized by dark, velvety discoloration of body folds and folds and thickened skin. This can affect skin changes in the patient's armpits, groin, and neck. Children who develop acanthosis nigricans have an increased risk of type 2 Diabetes Mellitus. In addition, obesity may be associated with other dermatological conditions, including distensae (stretch marks), intertrigo (inflammation of skin folds), furunculosis (boils), and inflammation of the hair follicles.<sup>13</sup> (5) Renal system. Obese children and adolescents may have kidneys that are larger than normal for body weight. Likewise, hypertension and diabetes mellitus can impair kidney function in obese children and adolescents.<sup>14</sup> (6) Neurological effects. Obese children and adolescents have an increased risk of idiopathic intracranial hypertension, which refers to high pressure in the epidural space around the brain and spinal cord. These spaces are filled with cerebrospinal fluid to protect against injury, provide nutrition, and remove waste.<sup>15</sup>

(7) pulmonary system. Globally, obesity and asthma are common childhood health problems, and a correlation has recently been found between the two. Higher body weight influences and modifies asthma characteristics, such as increased airflow resistance and a slightly reduced response to corticosteroids, but does not appear to worsen symptoms or affect stability. Although these are not mutually exclusive, the increased incidence of asthma in obese children and adolescents is significant.<sup>16</sup> Obstructive sleep apnea (OSA) is a serious disorder in which a person's breathing stops and start repeatedly during sleep. Snoring is also common in OSA patients which can lead to complete airway obstruction, oxygen desaturation, fragmented sleep patterns and sleep disturbances. In



obese patients, this may exacerbate underlying cardiovascular or metabolic problems, and early identification can reduce these problems. Similarly, obesity hypoventilation syndrome is a rare, life-threatening disorder characterized by severe obesity and alveolar hypoventilation while the patient is awake.<sup>11</sup>

(8) Musculoskeletal system. Obesity increases the stress on bones, potentially causing fractures. For example, hip fractures are more common among children or adolescents who are obese than those who are not. Given the rising obesity rate, safety devices such as car seats should provide an effective measure of preventing fractures in obese people. In addition, compared to children and adolescents with lower BMI, children and adolescents with obesity are also at higher risk of developing genu valgum; impaired mobility; lower extremity malalignment; and musculoskeletal pain in the back, legs, knees, ankles, and feet may also have orthopedic co-morbidities such as a slipped capital femoral epiphysis or Blount's disease.<sup>11</sup>

(9) Digestive system. Coupled with a sedentary lifestyle, eating high amounts of refined carbohydrates may increase an individual's risk for nonalcoholic fatty liver disease in which fat deposits build up in the liver and cause scarring. Obesity is the leading cause of nonalcoholic fatty liver disease, and it affects 10% of people worldwide regardless of ethnic background. Lifestyle and family habits are contributors to the increase in prevalence.<sup>17</sup> However, research regarding the adverse outcomes of nonalcoholic fatty liver disease and the development of future health conditions in pediatric patients is limited.<sup>18</sup> In addition, in boys and girls and adolescents without pre-existing conditions, obesity increases the risk of cholelithiasis.<sup>11</sup>

(10) Psychosocial effects. In addition to the consequences of physiological changes, obesity in children and adolescents can also have negative effects on self-confidence and cognitive development. For example, one study showed significant impairment in attention, retention, intelligence, and cognitive flexibility among obese adolescents. Another studies concluded that the link between adolescent obesity and cognitive deficits is worrying and can reduce adolescents' academic and professional potential.<sup>19</sup>

The influence of socioeconomic and cultural environment on childhood and adolescent obesity is more important than genetic factors. The overall prevalence of childhood obesity is greater in countries with a higher socioeconomic level than in countries with a lower socioeconomic level. In a community-based study observed that the prevalence of obesity is increasing in children from low-income families. Non-parental caregivers were also associated with increased childhood obesity (unpublished data). Countries that are experiencing rapid development are showing sharp increases in childhood obesity. In China, the number of overweight and obese children aged 7-18 increased 28-fold from 1985 to 2000.<sup>4</sup> The World Health Organization (WHO) Strategy on Diet, Physical Activity and Health calls for local, regional and global efforts to improve the well-being of children worldwide through education, exercise and healthy food choices. The World Health Assembly has set six global targets for improving maternal, infant and child nutrition by 2025. Support enables children and adolescents with obesity to overcome the everyday restrictions in their environment. WHO advises making healthy choices easy by working with school and community programs to provide healthy options for school lunches. Recognizing goals and strategies for obese children and young people encourages positive behavior and promotes healthy choices and practices. In addition, exploring ways to overcome environmental limitations can help children with the choices they have and ultimately guide them to a healthier lifestyle.<sup>20</sup>

## CONCLUSION

The various problems in obese children and adolescents are multifactorial in nature that tend to persist into adulthood with lifelong clinical changes including hypertension, hypercholesterolemia, metabolic syndrome, orthopedic disorders, obstructive sleep apnea (OSA), asthma, fatty liver disease, and increased risk for cardiovascular disease to psychosocial consequences.

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