

# Root and Interruption of Childhood Obesity: A Systematic Review

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## ABSTRACT

Childhood obesity has reached epidemic levels in developed as well as in developing countries. Overweight and obesity in childhood are known to have significant impact on both physical and psychological health. Overweight and obese children are likely to stay obese into adulthood and more likely to develop non-communicable diseases like diabetes and cardiovascular diseases at a younger age. Environmental factors, lifestyle preferences, and cultural environment play pivotal roles in the rising prevalence of obesity worldwide. In general, overweight and obesity are assumed to be the results of an increase in caloric and fat intake. On the other hand, there are supporting evidence that excessive sugar intake by soft drink, increased portion size and steady decline in physical activity have been playing major roles in the rising rates of obesity all around the world. Childhood obesity can profoundly affect children's physical health, social, and emotional well-being, and self esteem. It is also associated with poor academic performance and a lower quality of life experienced by the child. Many co-morbid conditions like metabolic, cardiovascular, orthopedic, neurological, hepatic, pulmonary, and renal disorders are also seen in association with childhood obesity.

**Keywords:** Childhood obesity, consequences, epidemiology, lifestyle, non-communicable disease, overweight

## INTRODUCTION

As demonstrated by the incidence of stunting, anemia, and iron and zinc deficiencies, the world is witnessing a rapid epidemiological and nutritional transition characterized by steady nutritional deficiencies. The World Health Organization (WHO) classifies adults with a BMI of 25 to 30 as overweight, while obesity is categorized by phase or grade - grade 1: BMI 30.0-34.9, grade 2: BMI 35.0-39.9 and grade 3: BMI 40.0.0. Grade 3 obesity has been referred to as morbid obesity, but the word has been altered appropriately for several reasons: morbidity may not happen at BMI concentrations above 40 but it can definitely be discovered

at BMI concentrations below 40 The incidence of obesity, diabetes and other chronic diseases (CDDs) linked to nutrition is increasing gradually. In developed countries, obesity has reached epidemic rates. In developed countries, the largest prevalence rates of childhood obesity were observed; however, their incidence is also increasing in developing nations. <sup>[1]</sup>

Females are more likely to be obese than men due to intrinsic hormonal differences. <sup>[2]</sup> It is convincing that the genesis of Type 2 Diabetes and Coronary Heart Disease begins in adolescence, with childhood obesity being an significant factor. <sup>[3]</sup> In the last four centuries, particularly in the developed world, there

has been a phenomenal rise in children's ratios. Studies from various areas of India over the past century also show comparable trends. [4-6] Childhood obesity is one of the most severe challenges. The issue is global and affects many low-and middle-income nations on an ongoing basis, especially in urban environments. Increased prevalence at an alarming pace. Overweight kids under the age of five are projected to exceed 42 million worldwide in 2010. Nearly 35 million of these live in developing countries. [7]

### CAUSES OF CHILDHOOD OBESITY

It is frequently acknowledged that an increase in obesity outcomes from an imbalance between energy intake and consumption, with an increase in the favorable energy equilibrium being strongly linked to the adopted lifestyle and nutritional intake preferences. [8] However, there is increasing proof that the genetic background of an individual is crucial in determining the risk of obesity. Research has made a significant contribution to our understanding of variables associated with obesity. [9] Child risk variables for obesity include nutritional consumption, physical activity, and sedentary behaviour. [10] Factors like age, gender, moderate the effect of such risk variables. Parenting style family features, lifestyles of parents also play a part. Environmental factors such as school policies, demographics, and work-related requirements of parents further affect the behaviors of eating and activity. [11] Genetics is one of the main variables deemed to be a cause of obesity. Some trials discovered BMI to be heritable by 25–40 percent. [12] However, genetic susceptibility often needs to be combined with contributing environmental and behavioral variables to impact weight. [13] The genetic factor accounts for less than 5% of childhood obesity cases. [14] Thus, while genetics can play a part in obesity growth, it is not the cause of the drastic rise in childhood obesity. [15]

### 1. CONSUMPTION OF FAST FOOD

Fast food consumption: Increased fast food intake in latest years has been associated with obesity. Many families, particularly those with relatives working outside the home, opt for these locations because their kids often favor them and they are both convenient and cheap. [16] Foods served in restaurants serving fast food tend to contain an enhanced amount of low-nutrition calories. A research undertaken in fast food restaurants examined the eating practices of lean and overweight adolescents. [17] Researchers discovered that both groups burned more calories eating fast food than they would normally eat at home, but the lean group compensated for the greater caloric intake by changing their caloric intake before or after the fast-food meal in anticipation of or compensation for the surplus calories eaten during the fast-food meal. [18] While many studies show that weight gain with frequent fast food consumption, a causal relationship between fast food and obesity is hard to develop. [19]

### 2. SUGARY BEVERAGES

A research indicates kids aged 9–14 from 1996–1998 discovered that sugar beverage consumption increased BMI by tiny quantities over the years. [20] Sugary beverages are another factor examined as a potential contributing factor to obesity. Sugary drinks are often considered to be soda-limited, but juice and other sweetened drinks fall into this category. [21] Many studies have examined the connection between sugar drink consumption and weight gain and have consistently been discovered to contribute to overweight [22] Also avoid carbohydrate drinks such as breads, starchy vegetables, legumes, drinks such as orange fruit juice. Sugary drinks are less filling than food and can be consumed faster, leading to higher caloric intake. [23] Eating high-calorie foods on a regular basis, such as fast foods, baked goods and snacks on sales machines, can cause your kid to gain weight. Weight gain can also be caused by candy and desserts, and more and more

proof points to sugar beverages, including fruit juices, as some individuals blame for obesity.

### 3. ENVIRONMENTAL FACTORS

While comprehensive television viewing and the use of other electronic media contributed to the sedentary lifestyles, the possibilities for physical activity were decreased by other environmental variables. Opportunities to be physically active and secure environments to be active in have declined in latest years. [24] In the past, most kids have been walking or cycling to college. A 2002 research discovered that 53% of parents drove their kids to school. [25] If your kid comes from a family of individuals who are overweight, he or she may be more likely to weigh. In an setting where high-calorie foods are always accessible and physical exercise is not encouraged, this is particularly true. People have restricted funds and restricted access to supermarkets in some societies. As a consequence, they could purchase convenient foods that do not rapidly spoil such as frozen meals, crackers and cookies. In addition, individuals living in neighborhoods with reduced incomes may not have access to a safe place to practice.

### 4. LACK OF EXERCISE.

Children who don't burn as many calories, because they don't practice much are more likely to gain weight. Also contributing to the issue is too much time invested in sedentary operations, such as watching TV or playing video games.

### FUTURE HEALTH RISKS

- **Type 2 diabetes:** They are more likely to create elevated concentrations of insulin in their body when kids are obese. This may lead to diabetes of type 2. Type 2 diabetes is a severe disease that can result in harm to the nerves, eye issues, and kidney issues.
- **Asthma:** Children who are obese are 40-50 percent more probable than kids with ordinary weight to create asthma.

- **Obstructive sleep apnea:** Children who are obese are 60% more likely to develop breathing problems in their sleep.
- **Cardiovascular diseases:** Obese children are increased risk of developing high cholesterol level and high blood pressure. This can lead to the build-up of plaque in the arteries. This in turn to heart attacks and strokes.
- **Non-alcoholic fatty liver disease (NAFLD):** Obese children are at a higher risk of developing non fatty liver disease. Non fatty liver disease is a condition in which the fat accumulates inside the liver. When this happens, the child might suffer from scarring and liver damage.
- **Early puberty:** It is more likely that obese children will experience hormonal imbalances in their bodies. This may result in early puberty.

### Depression and anxiety

A latest study found that most trials find a potential connection between eating disorders and depression. [26] This connection, however, is not unidirectional; depression can be both a cause and a result of obesity. [27] In addition, a greater life-time incidence of anxiety disorders was recorded in a clinical sample of obese adolescents compared to non-obese controls. [28] While some trials show no important connection between enhanced BMI and enhanced symptoms of anxiety. [29] Therefore, the connection between obesity and anxiety may not be unidirectional and definitely not conclusive.

### Emotional problems

A review of 10 published studies over a 10-year period (1995-2005) with sample sizes greater than 50 revealed in one of the few studies to investigate the psychological impact of being overweight / obese in children that all participants reported some level of psychosocial impact as a result of their weight status. [30] Being younger, female, and with an increased perceived lack of control over eating. [31]

- Childhood obesity can be detrimental to the body in a multitude of ways. More likely to have children with obesity [32-35]
    - High blood pressure and elevated cholesterol, they are risk factors for cardiovascular disease (CVD).
    - Increased risk of glucose tolerance, resistance of insulin, and type 2 diabetes.
    - Breathing difficulties, like asthma and sleep apnea.
    - Joint problems and musculoskeletal discomfort.
    - Fatty liver disease, gallstones, and gastro-esophageal reflux like heartburn
- Obesity in children is also linked to: [36-38]
- Psychological issues like anxiety and depression.
  - Low self-esteem and lower self-reported quality of life.
  - Social problems like bullying and stigma.
- Children with obesity are more probable to become obese adults. [39] Adult obesity is associated with enhanced danger of a number of severe health circumstances, including heart illness, type 2 diabetes, and cancer. [40]
  - If kids are obese, their adult risk factors for obesity and illness are likely to be more serious. [41]

## CHILDHOOD OBESITY- PREVENTION

As many, but not all, obese kids will eventually become obese adults; prevention is the key to achievement in obesity control. The age is linked to "tracking" or the probability of childhood obesity persistence into adulthood. Adult obesity management is a challenging and often unsuccessful feature, particularly in the lack of a recognized organic etiopathogenesis. [42] On the other side, childhood obesity prevention can be more rewarding, offering better opportunities to reduce long-term complications. There are three levels of childhood obesity prevention. [43,44]

1. Primordial prevention: addresses the maintenance of a good weight and ordinary BMI throughout childhood and adolescence.
  2. Primary prevention: seeks to avoid obese kids with overweight.
  3. Secondary prevention: aimed at obesity treatment to decrease co-morbidity and, if possible, reverse overweight and obesity.
- The pillars of the prevention program are the inculcation of healthy habits such as plant-based foods and fruit consumption and integration of exercises and active lifestyle. When coupled, all the above strategies can be implemented sequentially from perinatal to adolescence as follows:

**Perinatal:** This involves appropriate prenatal nutrition with ideal maternal weight gain, excellent diabetic blood sugar control, postpartum exercise weight loss and dietary counseling. [45]

**Infancy:** Early breastfeeding, exclusive 6-month breastfeeding followed by the incorporation of strong ingredients, a healthy diet to avoid unhealthy calorie-rich meals and close weight gain tracking. [46]

**Preschool:** Providing parents and kids with dietary education to create healthy eating habits, offering healthy food preferences through early knowledge of various foods and flavors and carefully following the rate of weight gain to avoid early adiposity rebound [47]

**Childhood:** Monitoring both weight and height, preventing excessive prepubertal adiposity, providing dietary advice and emphasis on day-to-day physical activity. [48]

## CONCLUSION

When society focuses on the causes, the increasing problem of childhood obesity can be slowed down. There are many elements that play into obesity in adolescence, some of which are more important than others. In order to prevent obesity or overweight, a mixed diet and physical activity intervention in the community with a classroom element is more efficient. In addition, if parents implement a healthier lifestyle at home,



many issues with obesity might be prevented. Children learn to eat healthy, exercise and make the correct dietary decisions at home will eventually spill over into other parts of their lives. The prevention and control interventions targeted at reducing sugar intake and high-calorie snacks with greater consumption of vegetable-and fruit-based diet. This involves eating high-fiber calcium-rich diet with balanced micronutrients, regular good breakfasts, home-cooked family meals, lower portion size, and eating-out curtailment. Last but not least, it is vital to reduce the duration of "screen time," particularly television time, and to increase the level of physical activity to prevent obesity in children. This will have the greatest impact on the decisions that children make when choosing foods to eat at school and fast-food restaurants and when choosing to be active. In the course of time, focusing on these causes can reduce childhood obesity and contribute to a healthier community as a whole.

#### Authors' Contribution

All the authors contributed equally

#### Conflict of Interests

No conflicts of interest

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