



## **The Major Contributors to Childhood Obesity: Unhealthy Diet and Lack of Physical Activity**

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**Citation this Article:** Dr. Sudhir Ambati, “The Major Contributors to Childhood Obesity: Unhealthy Diet and Lack of Physical Activity”, IJMSIR- May - 2021, Vol – 6, Issue - 3, P. No. 18 – 25.

**Type of Publication:** Review Article

**Conflicts of Interest:** Nil

### **Abstract**

Understanding childhood obesity and obesity-related risk factors provide the basis to explore the necessary measures to prevent disease progression and to improve disease management. Childhood obesity remains a public health issue globally, and the disease can progress to adulthood if not treated or managed well. There has been an assumption that a combination of different lifestyle behaviors plays a role in the development of childhood obesity. Such behaviors are modifiable factors that need to be effectively managed. This review thus focuses on discussing the risk factors of childhood obesity. The article outlines how lifestyle behaviors, mainly unhealthy eating and lack of physical activity, are the main contributing factors to childhood obesity. Effective management of these lifestyle behaviors has an important role in preventing and controlling childhood obesity. Therefore, understanding how these factors contribute to childhood obesity helps achieve effective management and early treatment of childhood obesity.

**Keywords:** Childhood obesity, Risk factors, Lifestyle behaviors, Unhealthy eating, Physical activity

### **Introduction**

Obesity during childhood has been a public health issue globally. Childhood obesity is among the most serious

public health problems globally for the 21st century that affects many countries but steadily affects low and middle-income countries [1]. Obesity as a public health issue impacts the health and wellbeing of children and can progress to adulthood if not managed and treated well. Obesity affects the health and wellbeing of children, mainly psychological health, cardiovascular health, and overall physical health [2]. Similarly, childhood obesity is associated with several comorbidity conditions, including diabetes, depression, hyperlipidemia, hypertension, sleep apnea, and low self-esteem [2]. Thus, the relationship between obesity and health status makes the condition a public health concern [2]. Due to the increasing prevalence, childhood obesity has reached epidemic levels in various countries worldwide.

Recent evidence illustrates that in countries like the United States, childhood obesity has reached epidemic levels, with approximately 17% of children living with obesity [2]. Based on the current data collected about childhood obesity, it is evident that children aged six years and above are living with obesity. The National Health and Nutritional Examination Survey provided recent data on childhood obesity and demonstrated that between 2015 and 2016, the prevalence of childhood obesity among children in the United States is high,

with preschool-aged children (aged between 2 and 5 years) accounting for 13.9% and school-aged children from 6 to 9 years account for 18.4% [3]. It is generally acknowledged that an increase in obesity during childhood is associated with lifestyle behaviors, including eating habits and physical exercises. Existing evidence demonstrates that an imbalance between energy intake and energy expenditure is widely accepted as the contributing factor to childhood obesity [1, 22]. Other evidence illustrates that the genetic background of the individual, sedentary behaviors, dietary intake, and physical activity play a crucial role in the onset of childhood obesity. Factors, including gender and age, moderate such risk factors among children [4]. Besides, family features, which include the lifestyle of parents and parenting style, especially during pregnancy, have a crucial role in childhood obesity [1, 22]. Research has thus made a significant contribution to better understand the risk factors of obesity.

Environmental factors, including school policies, work-related demands of parents, and demographics, also influence children's eating and physical activity behaviors [1]. In this article, childhood obesity is discussed with a focus on the main contributing factors. The article discusses unhealthy eating and lack of physical activity as the major contributing factors to childhood obesity.

### **The Major Contributing Factors of Childhood Obesity**

Obesity is known to be a global problem, and there has been an eightfold increase in the prevalence of childhood obesity since 1975 [5]. Therefore, prevention interventions for childhood obesity have been introduced, and they mainly emphasize the use of behavioral interventions, highlighting the need for

behavioral changes, including a healthy diet or balance energy intake and increased daily physical exercises. However, the effects of such behavioral changes are limited globally and could not stop the prevalence of childhood obesity [5]. Therefore, exploring the effects of unhealthy eating and lack of physical activity provides the basis to understand the development of childhood obesity.

### **Unhealthy Diet and Childhood Obesity**

The world is experiencing rapid nutritional and epidemiological transition, which is characterized by malnutrition and nutritional deficiencies as evidenced by the persistent prevalence of stunting and deficiency in iron and zinc [6]. Thus, dietary-related behaviors and food choices are established mainly during early childhood, and they are widely acknowledged to contribute to obesity risks. Poor food choices or food preferences and overconsumption enhance the risks of developing obesity [18]. Further, unbalanced food intake, including the use of fast foods, and energy-dense foods during early childhood, leads to changes in body weight and body composition, which are the key determinants and predictors for obesity and overweight among children [18]. Dietary factors and the risk of developing obesity have also been reported in maternal eating status, particularly among pregnant women. Maternal malnutrition and a nutritional deficiency during the gestation period are among the key determinants of undernutrition that causes childhood obesity. Maternal nutrition and insufficient nutrition during the gestation period increase the risks of obesity among unborn and newborn children [6]. Besides, maternal malnutrition leads to maternal underweight due to inadequate nutrition during the gestation period when nutrient requirements should be increased. This increases the risk for childhood obesity before and after

birth. In such a context, the nutritional status of women, mainly maternal malnutrition and undernutrition, enhance childhood obesity during a child's growth period [7, 8]. Moreover, during the conception period and pregnancy, nutritional status is crucial for the growth and development of the fetus. Thus, poor maternal nutrition and undernutrition during fetal growth increase the risk of obesity in offspring [9]. Besides, an unhealthy diet during pregnancy in terms of protein intake, high fat, high sugar, and low fiber intake increases the likelihood of childhood obesity.

A prospective cohort study of 1410 pregnant women investigated the impacts of protein intake on the body composition of offspring aged six years and the association with obesity risks. The study revealed that a higher intake of proteins during pregnancy leads to a higher fat-free mass index and overweight among children. The study indicated that a higher protein intake during pregnancy increases infant body mass index (BMI), which is the main determinant of childhood obesity [10]. Based on the findings, increasing dietary intake of foods high in proteins increases neonatal fat mass among pregnant women. Besides higher protein intake, a high-fat intake among pregnant women is also associated with childhood obesity. Dietary intake of foods high in fats increases neonatal BMI, which reflects the onset of childhood obesity. This is evidently supported in a cohort study that examined the associations between macronutrient intake during pregnancy and infant BMI [11]. The study showed that maternal dietary intake of high-fat diets increases BMI peak among infants. Similarly, the study revealed that a higher maternal intake of carbohydrates and sugary foods during pregnancy leads to unfavorable BMI peaks and higher childhood BMI [11]. High-fat intake, especially diets with

polyunsaturated fatty acids, is associated with childhood obesity. Intake of such diets leads to increased body fats and adiposity. Fetal nutrition with diets high in polyunsaturated fatty acids can increase body weight and fat accumulation that causes the development of obesity. A prospective cohort study that investigated whether there is an association between high intake of polyunsaturated fatty acids during pregnancy and childhood abdominal fats supported the effects of such fats in facilitating the development of childhood obesity [12]. The study revealed that high concentrations of maternal n-3 and n-6 polyunsaturated fatty acids among pregnant women lead to increased abdominal and body fats during childhood, especially among children aged six years [12]. Moreover, unhealthy eating with the dietary intake of sugary foods during childhood enhances the development of obesity. Sugary foods are among the notable contributing factors of obesity risk.

A longitudinal study of 1189 children examined whether intake of sugar-sweetened beverages predicts the development of obesity at six years. The study found that consumption of sugar-sweetened beverages during infancy increases the risks for obesity during early childhood [13]. The study established that the prevalence of obesity among 6-year old who take sugary-sweetened beverages during infancy was 71%. Further, the study showed the prevalence of 92% before children reached six months [13]. From the findings, it can be concluded that a higher intake of sugary foods during infancy is a modifiable risk factor for obesity development. Similarly, a high intake of sweetened foods, such as soft drinks during early childhood, leads to increased BMI and abdominal obesity among children. Current evidence demonstrates that among pre-school children aged between 8 and 14 years,

frequent intake of sweetened products, such as juice leads to abdominal obesity [14]. This shows that daily consumption of foods and products with a high amount of sugar during childhood facilitates the onset of obesity that can last up to adulthood. Another study showed that a higher intake of juice of over 6 ounces every day among children, especially at one year of age, increases BMI during both early and mid-childhood, which indicates early development of obesity [15]. Higher intake of sugary foods during childhood is because the majority of children or infants have strong preferences for sweetened foods, hence promoting obesity development. Higher intake of obesity-causing foods is also based on formula feeding. For instance, higher consumption of foods with high-protein formula increased the risk of obesity during childhood.

A systematic review that examined formula feeding with a focus on the association of different concentrations of proteins in infant and child foods showed that such diets increase growth and body composition, which facilitates the risk of obesity and overweight later in life [16]. The review indicated that high protein concentrations in infant and child's food enhance obesity development. The review further indicated that in milk formula, protein concentrations of over 1.8 g/100 kcal leads to weight gain during infancy that increases the chance of later obesity development [16]. Further, a high intake of protein during early childhood, in excess of metabolic requirements, has been found to stimulate insulin secretion and insulin-related growth factors. This, therefore, enhances body weight gain during infancy and increased obesity risks in later life [17]. Despite the significant contributions of higher protein concentrations in formula feeding during infancy, the mechanisms by which such concentrations

enhance weight gain, body composition, and later obesity risks are not clear.

Unhealthy eating behaviors, together with lack of physical exercise, are believed to enhance the risk for obesity development during childhood. Lack of aerobic exercise is associated with weight gain and body composition, which are the risk factors for childhood obesity [6]. Similarly, researchers support that people across ages have a tendency to gain body weight due to fat accumulation when they are less active because engaging in physical exercises burns excess calories and helps maintain a healthy weight and reduces the development of obesity [19, 20].

#### **Lack of Physical Activity and Childhood Obesity**

Physical activity is an important aspect of enhancing physical fitness. Notably, physical activities are considered the foundation of all levels of personal development [21]. They play a central role in enhancing child health and development by increasing children's daily energy expenditure and improving their physical fitness [22]. For children and adolescents, these physical activities encompass games, sports, recreational activities, chores, physical education, and planned exercises such as family or community outdoor activities [23]. The World Health Organization (WHO) advises that children who seek to improve their fitness, enhance their bone and muscular health, and enhance their metabolic health should engage in at least 60 minutes of vigorous physical activity daily [23].

The lack of physical activity can significantly contribute to diverse diseases encompassing obesity, respiratory diseases, and some types of cancers [21]. Obesity is characterized by energy homeostasis occasioned by excess energy supply in relation to the demands of the body [23]. In this sense, there is an excess of energy accumulation in the body in the form

of adipose tissue. Specifically, childhood obesity has been considered one of the most critical public health challenges of the 21<sup>st</sup> century [21]. This is because obesity can severely damage a child's organs such as heart, lungs, and kidneys, thus impairing bodily functions encompassing blood control and circulation, alongside the balancing of hormones in the body. A child's lifestyle is highly relevant in determining or preventing the development of obesity [23]. Some habits such as formula-feeding instead of breastfeeding, overeating, preference for fast foods, playing video games, excess watching of television, and lack of exercise significantly contribute to the development of obesity [23].

Engagement in physical activity has been proven to reduce obesity risks among children. Regular physical activity is associated with an enhancement in aerobic capacity strength, muscle growth, reduction of blood pressure and cholesterol in the body [23]. The school environment provides children with the opportunity to engage in physical activity, given that most school curricula integrate physical education into learning [24]. It was established that friendly and vigorous physical activities among children were associated with lower obesity risks. Increased physical activity is a primary treatment goal in weight loss interventions intended to increase energy expenditure and improve cardiovascular health [25]. Thus, through participation in physical exercises, children spend accumulated energies in their bodies, hence reducing risks of obesity. A combination of enhanced physical activity and improved nutrition among children is highly likely to reduce incidences of childhood obesity [26]. On the contrary, childhood obesity has been attributed to the lack of physical activity among children. Notably, low levels of physical activity and an increasingly sedentary

lifestyle have been correlated with obesity [26]. Low or lack of physical activity in childhood is a global social norm that is also a significant contributor to obesity. Once obesity has set in, undertaking physical activity becomes a challenge, leading to a vicious cycle of lack of physical activity and obesity [27]. Children who do not engage in physical activities encourage sedentary lifestyles characterized by passive activities such as watching television.

Children who spend more screen time on computer devices such as phones, computers, and televisions developed childhood obesity [28]. This was attributed to the fact that children exposed to the screens for long periods of time do not participate in physical activities, hence consuming too much energy, thus developing obesity [28]. Similarly, it was established that children who were from families that led sedentary lifestyles and lacked sports practice were highly likely to develop childhood obesity [29]. Remarkably, sedentary lifestyles encompass spending most of the time in passive activities such as watching television or playing computer and video games, which lead to a high accumulation of energy in the body. Increased uptake of large quantities of energy combined with the lack of physical exercise significantly contributes to the development of obesity [29].

In a different study, it was shown that children who do not perform any physical activity daily have a high probability of becoming obese [30]. Furthermore, children who were obese could not engage in physical activities. This implies that obesity also reduces the ability of children to undertake physical activities. Notably, the lack of regular physical activity was also attributed to the development of obesity among children [30]. In the same sense, it was established that children who had low levels of engagement in physical

activities developed higher fat mass index and higher body mass index (BMI) levels. This implies that the lack of physical activity among children highly resonates with the development of childhood obesity.

Generally, the etiology of childhood obesity is multifaceted. The causes encompass genetic, environmental, and psychosocial factors [29]. However, the lack of physical activity is considered a major contributor to childhood obesity [27-31]. This is because lack of physical activity leads to high levels of energy and fat accumulation, leading to the development of obesity. In this sense, physical activity should be encouraged to eradicate childhood obesity.

### Conclusion

Childhood obesity is a public health concern worldwide. There are different risk factors that contribute to the development of childhood obesity. Among the most common risk factors include lifestyle behaviors, such as eating behaviors and poor engagement in physical exercise. Unhealthy eating during pregnancy or maternal malnutrition and frequent intake of diets rich in high levels of sugar or sugary-sweetened products, including soft drinks, facilitate the development of childhood obesity. Besides, lack of physical exercise after dietary intake of foods high in fats facilitates fat accumulation and excess calories in the body, hence increase the risk for obesity during childhood. Thus, unhealthy eating and lack of physical exercise are modifiable factors of childhood obesity, demonstrating the need to improve healthy eating and improve physical activity to prevent childhood obesity.

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