

## Review Article

# Childhood Obesity: A Review

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### Abstract:

*Childhood obesity is a complex disorder that occurs when a child is above normal weight for his/her age and height. According to World Health Organization childhood obesity is one of the most serious global public health challenges for the 21st century. Obesity predisposes health problems that previously were not seen until adulthood such as high blood pressure, elevated blood cholesterol level, type 2 diabetes, reproductive dysfunction, liver and renal diseases. Obese children are more prone to low self-esteem, negative body image and depression. The most effective cure for childhood obesity is prevention. Prevention may include primary prevention of overweight or obesity, secondary prevention or prevention of weight regains following weight loss. Until now, most of the approaches to control obesity have focused on changing the behavior of individuals, especially on diet and exercise.*

**Keywords:** Obesity, Lifestyle modification

**Received:** September 12, 2016; **Accepted:** October 16, 2016

### Introduction:

Childhood obesity has reached epidemic levels and a major health concern of the developed countries. Children who are overweight or obese have substantially higher risk of remaining obese into adulthood<sup>1</sup>. Children with obesity are at higher risk for having other chronic health conditions and diseases that impact physical health, such as asthma, sleep apnea, bone and joint problems, Type-2 diabetes and risk factors for heart disease. Children with obesity are more likely to suffer from social isolation, depression and lower self-esteem. About 70% of obese adolescents grow up to become obese adults<sup>2,3,4</sup>.

As developing countries move up the income scale and switch from traditional diets to Western foods, obesity rates rise<sup>5</sup>. As a result the low and middle income countries often face a dual burden: the infectious diseases that accompany malnutrition and increasing risk of chronic diseases linked to obesity and Western lifestyles. This review will discuss the cause and effect of childhood obesity as well as compile recommendations and initiatives currently in place to prevent childhood obesity.

### Epidemiology:

Globally, an estimated 43 million preschool children (under age 5) were overweight or obese in 2010, a 60 percent increase since 1990<sup>6</sup>. Of the world's 43 million overweight and obese preschoolers, 35 million live in developing countries. By 2020, if the current epidemic continues unabated, 9 percent of all preschoolers will be overweight or obese that is

nearly 60 million children<sup>6</sup>. According to the world survey statistics, childhood obesity statistics has dramatically multiplied in kids and quadrupled in teenagers in the previous 30 years. The rate of youngsters aged 6–11 years in the United States who were obese expanded from 7% in 1980 to about 18% in 2012. In 2012, more than 33% of kids and youths were overweight or obese. Obesity prevalence remains high and thus it is important to continue surveillance.

### Etiology:

Most Obesity results from excessive daily caloric intake relative to daily caloric expenditure. There are multiple etiologies for this imbalance. So, the rising prevalence of obesity cannot be addressed by a single etiology. Some genetic syndromes are associated with obesity such as Prader-Willi syndrome, Down syndrome and Turner syndrome. There are hormonal disorders associated with obesity like Hypothyroidism, Growth hormone deficiency, Cushing Syndrome.

However, environmental factors, lifestyle preferences and cultural environment seem to play major roles in the rising prevalence of obesity worldwide<sup>7,8,9,10</sup>. In a small number of cases, childhood obesity is due to genes such as Leptin deficiency or resistance to Leptin action, side effects due to drugs (e.g. Sulfonylureas, Tricyclic antidepressants)<sup>11</sup>. Most of the time, however, eating habit, personal lifestyle choices and cultural environment believed to play role in the development of obesity.

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**Diet:**

Over the last decades, the price of food has decreased substantially relative to income which made it more affordable to larger numbers of people. Children do not understand the consequences of their eating habit. Thus, junk food may appear especially appetizing to them.

Regular consumption of fattening junk foods like fast food, cookies and other baked goods, soda, candy, chips as a source of pleasure can be addictive for children. These changes have resulted in larger portion sizes and increased snacking between meals.

**Physical Activity:**

A steady decline in physical activity among all age groups has contributed to rising rates of obesity all around the world. Such low levels of physical activity have been shown to contribute to obesity and consequent circulatory problems.

In 2004 a study shows obese children had reduced blood flow compared with children of normal weight. Blood flow substantially improved after obese children exercised for 8 weeks<sup>12</sup>. As little as 3 hours of aerobic exercise per week significantly reduced the effects of obesity on blood vessels<sup>13</sup>. Furthermore, children in schools with more frequent physical education activity were more likely to have normal body weight<sup>14</sup>.

**Social Factors:**

Social factors also play a role in childhood obesity. Many urban neighborhoods do not have supermarkets, outdoor produce stands, or other healthy alternatives to convenience stores and fast food outlets, making it harder for residents to purchase fresh and inexpensive products<sup>15</sup>.

Concerns about the safety of outside play, more traffic on streets and fewer open spaces for outdoor activities often cause parents to keep their children inside and sedentary where computers, video games, and television offer entertainment<sup>13</sup>.

**Mechanism of Obesity:**

During growth, fat cells increase in number and when energy intake exceeds expenditure, fat cells increase in size. When fat cells have reached their maximum size and energy intake continues to exceed energy expenditure, fat cells increase in number again.

With fat loss, the size of the cells shrinks, but not the number. When fat loss occurs, none of the cells decrease in number they only decrease in size.

**Effects of childhood obesity:****Physiological effects:**

Children who have obesity are more likely to have: <sup>16-22</sup>

- High blood pressure and dyslipidemia, which are risk factors for cardiovascular disease (CVD).
- Increased risk of impaired glucose tolerance, insulin resistance and type 2 diabetes.
- Breathing problems, such as asthma and sleep apnea.
- Joint problems and musculoskeletal discomfort.
- Fatty liver disease, gallstones and gastro-esophageal reflux (i.e., heartburn).

**Psychological effects:** <sup>23-25</sup>

- Anxiety and depression.
- Social discrimination, low self-esteem and lower self-reported quality of life.

**Future Health Risks:**

- Children who have obesity are more likely to become adults with obesity<sup>26</sup>. Adult obesity is associated with increased risk of a number of serious health conditions including heart disease, Type-2 diabetes and cancer <sup>27,28</sup>.

**Prevention and Management:**

Obesity is easy to recognize but difficult to treat. The best way to significantly affect the prevalence of obesity is to prevent it. Parents should be taught to respect their child's appetite and to understand that it is not necessary for a child to finish every meal. Breast feeding and delaying the introduction of solid foods may decrease the risk of future weight problems<sup>29</sup>.

Food should not be used for non-nutritive purposes such as comfort or reward. Family meals should be oriented toward a healthy diet with 30 percent or less of calories derived from fat. Finally, parents should limit the amount of television that the child is allowed to watch and should encourage active play in its place<sup>29</sup>.

**Setting goals for weight loss:**

Weight loss goals should be obtainable and should allow for normal growth. Goals should initially be small, so that the child doesn't become overwhelmed or discouraged. Five to ten lb is a reasonable first goal or, if preferred, a rate of 1 to 4 lb per month can be established<sup>30</sup>.

**Effects of dietary pattern and TV watching:**

It appears that gains can be made in obesity prevention through restricting television viewing. Although, it seems that reduced eating in front of the television is at least as important as increasing activity.

Fast foods are one of the most advertised products on television and children are often the targeted market. Reducing the huge volume of marketing of energy-dense foods and drinks and fast-food restaurants to young children, particularly through the powerful media of television, is a potential strategy that has been advocated<sup>31</sup>.

#### **Physical activity:**

Activity patterns are an important target for behavior modification. Rewards should be determined with input from the child, and they should encourage further physical activity. Exercise is necessary to maintain weight loss and to redistribute body fat into muscle.

It is, therefore, an essential part of any weight management program. Initial exercise recommendations should be small and exercise levels should be increased slowly, to avoid possible discouragement. A reasonable goal is 20 to 30 minutes of moderate activity per day, in addition to whatever exercise the child gets during the school day<sup>31</sup>.

#### **Behavior modification:**

Nutritional education should be aimed at both the child and the family. It should include the components of a healthy diet and an understanding of food labels and the importance of dietary fiber. Parents should not verbally encourage the child to eat, and the child should not be forced to finish the entire meal.

It should be kept in mind that 3,500 calories must be eliminated by diet and exercise to lose 1 lb. It is necessary to provide parents with a specific calorie-per-day recommendation that follows guidelines for percentages of fat, protein and carbohydrates. Dietary fiber is also important, as it increases satiety and displaces fat in the diet<sup>32</sup>.

#### **Family involvement:**

It is important to involve the entire family when treating obesity in children. Many studies have demonstrated a familial aggregation of risk factors for obesity, and the family provides the child's major social learning environment.

It has been demonstrated that the long-term (10-year) effectiveness of a weight control program is significantly improved when the intervention is directed at the parents as well as the child, rather than aimed at the child alone<sup>33</sup>.

#### **Tips for Parents to prevent obesity:**

- Promote exclusive breast feeding for 6 months.
- Do not force to finish every bottle or meal.
- Introduce more fruits and vegetable after 6 months of age.

- Avoid highly sugared beverages and foods when possible.
- Limit the amount of high-calorie foods kept in the home.
- Provide a healthy diet, with 30 percent or fewer calories derived from fat.
- Do not provide food for comfort or as a reward.
- Limit amount of television viewing, computer and video games, snacking during television watching.
- Encourage health promoting active play.
- Establish regular family activities and outdoor activities.

#### **Conclusion:**

Obesity is a chronic disorder that has multiple causes. Overweight and obesity in childhood have significant impact on both physical and psychological health. In addition, psychological disorders such as depression occur with increased frequency in obese children. The causes of obesity, numerous recommendations and initiatives have been discussed that could potentially be effective for decreasing the rates of childhood obesity.

In today's society, too many parents are busy with their jobs and focusing on supporting the family that they often forget their children. Apparently, primary or secondary prevention could be the key plan for controlling the current epidemic of obesity and these strategies seem to be more effective in children than in adults. However, further research needs to examine the most effective strategies of intervention and prevention.

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**Citation of this article:**

Alam R, Sadique Z, Jahid I. Childhood Obesity: A Review. *Eastern Med Coll J.* 2017; 2 (1): 20-24.