

## Childhood Obesity: Risk Factors and Preventive Measures

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### Abstract

The obesity epidemic has grown worldwide in both the developed and developing countries. We are the “present” of the era with ever increasing growth of obesity; the coming generation is our “future”. Future of obesity largely depends on how we are handling it in present. Overweight and obesity prevailing in children has multiple causes from genetic factor, hormonal imbalance to environmental factors, lifestyle preferences and cultural practice. Keeping apart the hormonal, genetic and any physiological causes of obesity which are not in direct control, the remaining factors such as lifestyle, environment and cultural background which can be modulate to help eliminating percentage of existing and future obesity. Evidences have suggested that the major cause of obesity is imbalance between food habits and physical activity. Additional factors as per the recent researches show that excessive use of smart phones has increased the overweight issues and also increases the anxiety among the user. Childhood obesity has maximum chances to develop into adulthood obesity. Therefore, to eradicate the future obesity, there is need to increase the awareness of do's & don'ts to prevent obesity and also the educate common people to know about the pros & cons of obesity. This paper is inclined towards the various risk factors of childhood obesity, and also pointing some preventive and educational measure to avoid obesity in the future.

### Introduction

Obesity is a major global health issue. Worldwide, the incidence of obesity has been doubled in the past 30 years [1]. This gradual and constant increasing rate of obesity shows that the prevailing interventions are lacking somewhere. This also indicates that there will be more individual with overweight in coming years. Worldwide obesity has nearly tripled since 1975. In 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese. As per statistics 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese. Prevalence of childhood obesity is even alarming, it has been found that 41 million children under the age of 5 were overweight or obese in 2016. Over 340 million children and adolescents aged 5-19 were overweight or obese in 2016[1].

Significantly increased body weight is consider to be a factor in heart diseases, diabetes, stroke and some type of cancer [2,3]. Individual with a body mass index (BMI) of over 35 may face an increase in mortality of 40% in female and 62% in males, as compared to individuals with BMI in normal range [4]. Obesity, a potential threat to the decades-long decline in American mortality rates. Globally, overweight and obesity comprise the fifth leading risk factor for the mortality, resulting in some 2.8 million annual death [1].

### Causes

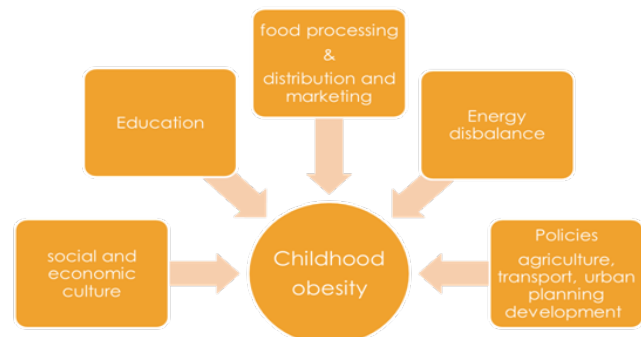
There are various causes of developing in an adult or a child. Few causes are documented as hormonal factor, genetical issues, medical reasons etc. Both genetic and environmental factors contribute to childhood obesity [5,6]. Majorly affected cause has been found to be the imbalance between calories consumed and calories expended. As per the WHO documentation, Global increases in

childhood overweight and obesity are attributable to number of factors including:

- A global shift in diet towards increased intake of energy-dense foods that are high in fat and sugars but low in vitamins, minerals and other healthy micronutrients;
- A trend towards decreased physical activity levels due to the increasingly sedentary nature of many forms of recreation time, changing modes of transportation, and increasing urbanization [7].

The changing diet pattern plays very crucial role in prevailing obesity as increasing trait in children and adults [8,9]. Some environmental factors including parental overweight, shared family lifestyle, dietary habits, and socio-economic status (SES) are linked to childhood overweight [10-14].

Various factors for childhood obesity from different background has been described in the chart below:



## Risk factors of childhood obesity

With advance researches, many studies shows various risk factors which indicate role of parents plays crucial role in their child weight. From Peri and prenatal factors to the BMI of parents are deciding factor for childhood obesity.

## Prenatal & perinatal influence

Researchers have considered effects that may occur in utero to “program” for obesity. In particular, as the number of women who are overweight early in pregnancy, increases the effects of this altered metabolism on the fetus may be important Catalano et al. examined 89 women either with impaired glucose tolerance or normal glucose tolerance in a prospective study of in utero effects on childhood obesity [15,16]. They assessed these women during pregnancy and at delivery, and assessed their children at an average of 8.8 years later. The strongest predictor of being in the highest tertile for weight for the children was the maternal pregravid weight, and this predictor was independent of maternal glucose tolerance and infant birth weight. Weight of mother before pregnancy can be consider as one of the factor of child measure in weighing machine.

## Parental BMI

There is an extensive evidence base to support the relationship between parental obesity and childhood overweight. Parental obesity is also related to children's fat intake, snack food consumption, a higher preference for high-fat foods and a lower preference for vegetables [17-19]. Various studies has shown that Parental BMI is one of the factor for overweight or obese child [17,20]. Children of overweight parents are also less active and more likely to prefer sedentary activities than children of parents with normal weight [19,21]. The family environment, including parental modeling of eating, can influence children's dietary behaviors [22]. As the researches showing link between parent and BMI, hence the prevention measures to tackle childhood obesity should target parent on basic level of any strategies formed.

## Parental restriction

There are researches which show that restrictive feeding practices have negative outcomes in the context of both child weight and child eating behaviors. In the context of child weight, Faith and colleagues in 2004 showed that higher restriction at age 5 years predicted higher BMI z-scores at age 7 years among low-risk children (defined as having a normal-weight mother [23]. Likewise, Francis and Birch in 2005 reported higher child weight and adiposity was associated with higher use of restrictive feeding. (20) High levels of control over children's food intake have been linked with subsequent disinhibited child eating and childhood overweight [24-27]. This risk factor surely needs to make parents more aware of how to deal their children wisely.

## Night time sleep duration

Many documented research studies are concluded that there is relationship between night time sleep duration of a child and the obesity or over weight child [28]. There are results which show child with lesser sleep duration falls in overweight or obese categories [29,30]. In school-age children, several studies have consistently reported that short sleep duration was an independent risk factor for obesity [29,31]. Drawing from a nationally representative sample of 2281 children 3–12 years of age, Snell and colleagues,[31]concluded sleeping less than 8 hours a night was correlated with higher BMI and being overweight at time 1 (baseline) and 2 (after 5.5 years), whereas

sleeping between 10 and 11 hours a night was correlated with not being overweight at time 1 (baseline) and 2 (after 5.5 years) [32].

Reasons referring to the link between short sleep duration and obesity has been explained by few studies. Shortened sleep duration has been hypothesized to influence weight status through decreased physical activity as a result of tiredness and increased energy intake given greater opportunity to eat. Another pathway is through influence on the hypothalamic mechanisms that regulate body weight and metabolism by key hormones, such as leptin and ghrelin [29,30, 33,34]. Hunger and appetite increase with lower leptin levels and higher ghrelin levels, and both low leptin and high ghrelin levels have been linked to short sleep duration [33,34].

## Sedentary lifestyle

It has been eventually found that the kids in today's generation prefer more sedentary behavior. With growing technology children are more drawn toward playing video games and watching TV rather than going out for play. Studies has shown half of obese children engaged in  $\geq 2$  h a day of screen time, compared to 33% of normal-weight children [34-36].

## Preventive Initiative

Considering the risk factors and causes discussed above and as the researches suggesting there is major role of individuals, parents and community to control the obesity today and tomorrow, hence a multilevel and multisectoral plan needs to be implemented globally.



## Preventive strategies

Following steps and preventive strategies should be implement in different level in family & community level [37]:

### Community programs

- NGO & community to organize activity based camp for children
- Increasing availability of healthier foods and beverages in public service venues and restricting access to less healthy foods and beverages
- Improving affordability of healthier food and beverage choices in public service venues
- Increase access to farmers' markets
- Limit advertising of less healthy foods and beverages
- Discourage consumption of sugar-sweetened beverages

### Back to old days

- Back to playground as in 80s -90s rather on screen.
- Relive your childhood play and ancient games with your kids.

- More social timing together than spending time alone over phone & tab.
- Organizing more outdoor activities in weekends rather than going to play zones.
- In cultivate importance of eating home food.

#### Counselling couples

- Assessment prior planning family.
- Tracking weight/BMR/BMI
- Encourage to incorporate balance diet & physical activity
- Less consumption of alcohol & cigarette smoking
- Avoid stress eating.

#### Educating & encouraging parents

- Plays most crucial role
- Being role model
- Avoid being restricting parents most of the time.
- Educate child about importance of physical activity & balance diet
- Encouraging frequent healthy meal and on portion control.
- Not to provide smart phone & tabs to get some time for themselves

#### Mandatory programs in school

- Regular weight & basic health components.
- Documentation of child eating pattern/habits.
- Reporting to parents for any unhealthy eating behavior.
- Every day Schedule for play time.
- Teaching about importance of physical activity.
- Teaching about good & bad food.
- Educating about meals portion & importance of breakfast .
- emphasis on activity based project than just reading & writing

**Who Recommendation on Children Physical Activity:** In order to improve cardiorespiratory and muscular fitness, bone health, and cardiovascular and metabolic health biomarkers:

- Children and youth aged 5–17 should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily.
- Amounts of physical activity greater than 60 minutes provide additional health benefits.
- Most of the daily physical activity should be aerobic. Vigorous-intensity activities should be incorporated, including those that strengthen muscle and bone\*, at least 3 times per week.

*\*For this age group, bone-loading activities can be performed as part of playing games, running, turning or jumping.*

#### Conclusion

As the researches and studies showing the various reasons and risk factors of adult and childhood obesity, which should be taken into consideration while making preventive strategies. One of the crucial factors coming up is parental health, hence educating adult, couple counseling before planning family is very important step toward preventing future obese and overweight child. Base of healthy life style is based teaching in young level hence the family and teachers or school plays important role. Hence the preventive measures should be taken starting primarily from family level and keeping the healthy life style should be continue towards the school and at

different community level. Multilevel, multispectral and multiple intervention strategies are needed to implement globally to eradicate the childhood obesity epidemic, which is growing all around in very progressive rate.

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