

# Prevalence of Risk Factors in Pediatric History of Currently Overweight and Obese Adults

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Received: 04/01/2017

Revised: 18/01/2017

Accepted: 20/01/2017

## ABSTRACT

Obesity has been recognized as a disease of the modern society. It is a highly prevalent condition in today's world where constant efforts are made by a number of researches and treatment efforts being found in order to deal with this condition and to eradicate it. Management of obesity is difficult and a time consuming process. Hence prevention is a better approach towards effective management. Literature has identified various risk factors or determinants for childhood obesity. The purpose of this study is to identify the prevalence of these incriminated factors in childhood history of currently overweight and obese adults. This study provides further evidential support to the presence of the incriminated risk factors in children, which, if paid due attention can help early prevention of the condition by managing the modifiable risk factors. A survey based study was conducted in 300 overweight/obese subjects and analysis of data revealed that a variety of risk factors were evident in the history of the overweight/obese adults including maternal obesity, low physical activity profile, lesser durations of sleep, increased intake of junk foods and increased sedentary profile.

**Key Words:** Obesity, Risk Factors, Maternal weight, Physical; inactivity, Sleep duration

## INTRODUCTION

Obesity, a consortium of complex etiology, with grim repercussions for the physical, social, economic and psychological attributes, seems to be afflicting virtually all ages and socioeconomic groups and threatens to overwhelm both developed and developing countries, marking a global shift of health burden from communicable to non-communicable diseases. Obesity is a condition which arises due to a number of modifiable or non-modifiable factors which are either there are a plethora of evidences incriminating a variety of risk factors in childhood to adulthood obesity.

Moreover, obesity itself is a health related risk factor as it can lead to a variety

of health related conditions and an increased rate of mortality. <sup>[1]</sup> Studies have shown earlier that children who are overweight/obese during their childhood are more likely to be overweight/obese as adults. <sup>[2]</sup> Not only are the overweight and obese children at a greater risk of developing the various metabolic diseases but also suffer from a deterioration of various domains of health related physical fitness. <sup>[3]</sup> World health organization provides us with a mortality rate of 2.8 million people who die every year as result of overweight and obesity. <sup>[2]</sup> Also, according to 2014 reports, more than 39% of adults more than 18 years of age are overweight and 13% are overweight globally. <sup>[4]</sup> Since management of such patients is difficult, prevention should be

focused upon in order to reduce the prevalence of obesity in the population. Identification of risk factors is the key to prevention. [5] Early identification of risk factors in patients during their childhood can help in reducing the chance and risks of developing obesity and the consequences caused by it. Childhood obesity can affect children's health for the rest of their lives; it is directly associated with adult obesity, itself associated with many health problems. A good understanding of the causes and consequences of this problem is necessary in order to take preventive action. [5] Evidence has identified myriad risk factors in early history of individuals which act as determinants for Overweight & obesity in later life. Low birth weight has been associated with several chronic diseases in adults, including hypertension, diabetes mellitus, and obesity. [6] Intrauterine life, infancy, and the preschool period (around the time of the adiposity or body mass index rebound) have all been considered as possible critical periods during which the long term regulation of energy balance may be programmed. Literature supplicates evidence of the role of the early life environment in the later risk of obesity. Parental obesity may increase the risk of obesity through genetic mechanisms or by shared familial characteristics. Environmental factors such as such as food preferences, sedentary behaviors, physical activity profile and duration of night sleep [7] have been incriminated as decisive factors for obesity in adult life.

Hence, the aim of this study is to identify the prevalence of these incriminated factors in childhood history of currently overweight and obese adults. This study provides further evidential support to presence of the incriminated risk factors in children, which, if paid due and timely attention can help early prevention of the condition by controlling the modifiable risk factors. [8]

## METHODOLOGY

This retrospective study was conducted on a group of 315 individuals both adult male and female in the age group of the individuals was between 18-40 years were included in the study. Individuals with known genetic cause of overweight or history of musculoskeletal or neurological illness decreasing the level of Physical Activity thus predilecting them to over adiposity were excluded from the study. Written informed consent was taken from all study subjects. Anthropometric measurements of height and weight were noted with the help of a stadiometer and weighing scale. BMI values of the individuals were calculated. Overweight and obese individuals were identified from their BMI values as per the NICE guidelines.

For the survey, a questionnaire was formulated with due deliberations of the available literature and thereby validated with two experts in the field. Revisions were made based on comments regarding the language, format, and context issues of the questions. The survey Questionnaire contained information on three broad domains:

1. Demographic Details (age, gender, height, weight & BMI, Educational Qualifications, Socioeconomic Status)
2. Mother and father's Details: Educational Qualifications, Weight, Age at the time of birth, Medical history.
3. Sedentary behavior : Television time, Laptop/PC usage
4. Physical Activity Profile
5. Eating Habits: Food preferences, Intake of junk food- Frequency as well as quantity
6. Lifestyle habits like sleep duration

## DATA ANALYSIS AND REPRESENTATION

The data was processed using Descriptive statistics - for demographic data (age & BMI) and percentages were used to depict proportions.

Out of the 315 approached with the questionnaires, 210 responded with filled

questionnaires thus giving a response rate was  $210/315 = 66.66\%$ .

Potential risk factors identified from various researches were chosen to identify whether these risk factors were present in the history of the subjects chosen.

NO OF SUBJECTS	215
MALE:FEMALE	110/105
AGE GROUP	18-40 YEARS
MEAN AGE	23.89
MEAN BMI	28.75

Questions asked in the questionnaire focused on various aspects of their childhood habits such as:

- Eating habits and Food preferences.
- Activity Profile
- Parental Obesity
- Other lifestyle habits like sleep, TV etc.

### **PARENTAL BODY WEIGHT**

35% of the study subjects had either of their parents in overweight/Obese categories at the time of their birth. 24% of study subjects had overweight/obese mothers while 12.04% had obese fathers and 14% had both the parents in overweight/obese categories.

The data points to maternal obesity as a significant risk factor (more than paternal obesity) for obesity in the progeny.

Having both the parents as obese increased this risk much more.

### **EATING HABITS AND FOOD PREFERENCES**

Since adults were asked about their frequency of junk food consumption during their childhood, 36% subject consumed junk food more than 3 times a week which means that more than  $1/3^{\text{rd}}$  population had a high frequency of consumption of such foods.

Food preferences in school canteen.

70% of subjects opted for unhealthy options like vada, samosa and other fried foods. A meagre 18.5% subjects mentioned that they opted for healthier food variants in canteen such as idli, sandwiches etc.

11.5% subjects mentioned both healthy as well as unhealthy foods in their food choices.

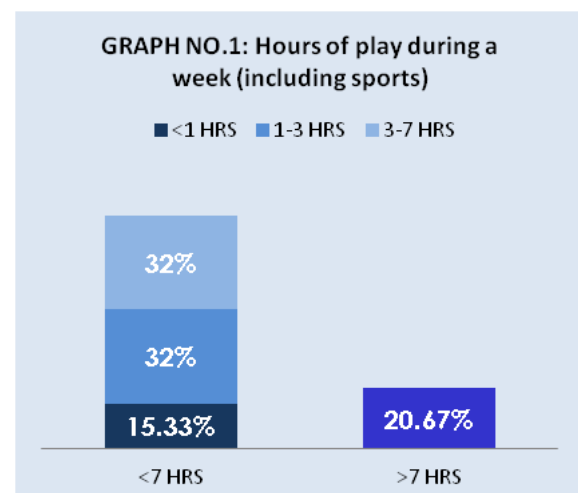
From the data available from schools which pointed to almost negligible availability of health snacking options, it can be inferred that the easy availability of unhealthy options in the school canteens propelled children towards this risk for adiposity.

### **ACTIVITY PROFILE**

The subjects were involved in sports and play during childhood. 35.3% played sports almost every day whereas 50% indulged 2-3 times a week. However their average hourly indulgence including sports and play was considerably less as compared to the guidelines of WHO [9] indicating ideal duration of play and sports during childhood.

### **SLEEP DURATION:**

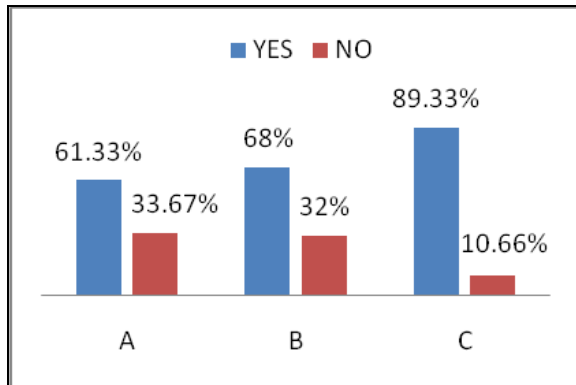
67% of the study subjects reported a sleep duration of less than 9 hrs during childhood. Our findings are corroborated by Ioná Zalcman Zimberget al in their research on Short sleep duration and obesity where they have incriminated sleep curtailment for the metabolic and endocrine alterations, including decreased glucose tolerance and insulin sensitivity, increased evening concentrations of cortisol, increased levels of ghrelin, decreased levels of leptin and increased hunger and appetite.



### **PARENTAL OBESITY**

Since parental obesity is a known risk factor with maternal obesity being more evidently found in a number of researches patients were asked about their parents' physical stature in which 52% mentioned their

mothers as overweight/ obese whereas 32.67% mentioned their fathers as overweight/ obese.

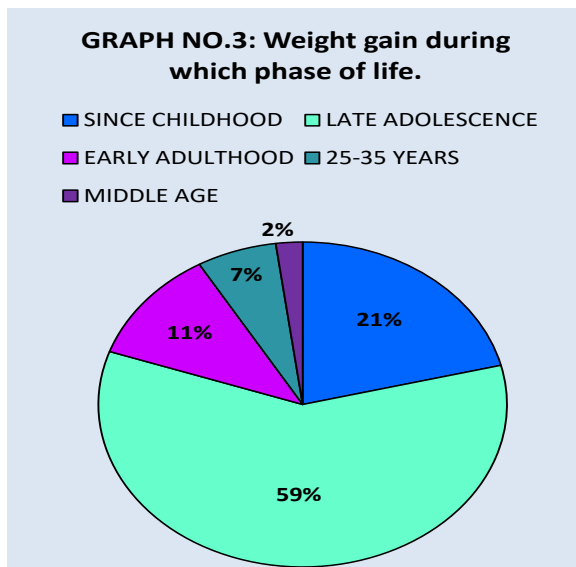


**GRAPH 2. OTHER LIFESTYLE HABITS LIKE SLEEP, TV ETC.**

A: Did you have breakfast before you went to school during childhood?

B: As a kid, did you live in a nuclear family?

C: Did you watch TV, read books or interact with family during your meals?



**Inference:** It was seen that 1/5 of the subjects was obese since childhood whereas the major chunk gained weight during their adolescence.

## DISCUSSION

Pediatric history of the currently overweight/obese subjects showed presence of many modifiable risk factors. Lifestyle habits at an individual level and the surrounding environment have a significant influence over the health and well being of an individual.

Weight gain during the late adolescence seen in majority of the subjects is one such example.

Increased promotion of 'The Big Five' (cereals, confectionaries, sodas, savory snacks and fast foods) is the most probable cause for these adults back then. Also activity levels are reduced from childhood to adolescence, thus making them overweight/ obese during that age.

Also, Genetics play an important role as inheritance patterns of obesity are commonly seen in families. The maternal obesity thus was found as a major risk factor for adiposity in adulthood. Also, parental lifestyle habits are an important factor as the children learn to develop the same habits and imbibe eating and other lifestyle patterns from their parents.

As mentioned earlier, 36% subjects were predisposed to unhealthy types of food very often during their childhood which can be the probable cause of their obesity today.

As far as preference of junk foods in school canteens are concerned, subjects probably chose the food options which they were given from the options to choose. Data shows the negligence of schools towards the diet and eating habits of their students during their childhood. Also, children prefer to eat items which they have been eating over the years with their parents. Hence, parental negligence is also responsible for the poor food choices made by the subjects during their childhood in school canteens.

It was also evident from the history that the subjects had a liking for sports and used to indulge in sports and play during their childhood. However, the frequency and duration of play in a week showed that the duration of sports involvement was too low thus reducing their overall physical activity profile which is a risk factor of obesity. As per WHO guidelines,<sup>[9]</sup> play or physical activity of at least one hour a day or 7 hours a week is essential for children. Low activity levels in children not only makes them overweight/obese but also affects their overall well being. Physical inactivity has an effect over the

musculoskeletal, cardiovascular and other systems of the body thus affecting the overall well being of the subject.

As seen in graph no. 3, lesser durations of sleep has been strongly linked to obesity thus being one of the factors for obesity in these subjects. Children who are 8 or 9 years old should sleep 10.5 hours a day and the duration of sleep decreases as the age increases. The optimum duration of sleep for children by the age of 14 is 9 hours. [10] 67% of the subjects revealed that they slept for less than 9 hrs during childhood which makes them more prone to obesity. Short sleep duration is associated with reduced levels of the hormone leptin in children and increased adiposity. [11] Lack of this satiety hormone tends to make children eat more than their daily requirements and gain excessive weight. Also, inactivity will make the child feel less energetic and lethargic throughout the day making him/her inactive thus leading to obesity.

Also, Children when performing other activities while eating tend to neglect portion sizes as their brain will not give signals of satiety. It is often seen that television viewing is associated with binge eating. Watching television for longer duration reduces leptin levels and increases craving. Also, longer durations of television viewing make one feel lethargic and a reduced physical activity profile is seen. Also studies reveal that children who eat while watching TV, read books or talk tend to consume more fat as compared to others which makes them more prone to become overweight and obese. Though these habits are not directly correlated to obesity, they are known to cause an effect over eating habits which leads to obesity.

## CONCLUSION

This study provides further evidence to previous researches as many risk factors identified in children earlier are found to be present in the childhood history of currently overweight and obese adults.

The significant factors thus identified in our research include birth

weight, maternal obesity, sleep duration, inadequate participation in physical activity & increased sedentary habits. Skipping morning breakfast, frequent intake of junk food also contributed to overweight & obesity.

## CLINICAL SIGNIFICANCE

The modifiable risk factors thus identified in this study could be worked upon with adequate & effective management strategies at school level, community level & at individual level to decrease the risk of obesity when these adolescents grow up. Moreover it important to appreciate that most lifelong habits be it propensity towards physical activity or appropriate dietary choices are made in childhood. So all management strategies aimed towards curbing the increasing epidemic of adiposity must target subjects early on in life for far reaching and positive results.

To prevent the development of obesity and its associated health risks, it is important to nip these incriminated risk factors in childhood itself through population-based efforts along with targeted interventions for these overweight and obese adolescents.

## Conflict of Interest

There exists no conflict of interest in this research to the best of our knowledge

## ACKNOWLEDGEMENTS

We wish to express our sincere gratitude to all our study subjects for their support to this research.

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How to cite this article: Arora A, Meghani A, Yardi S. Prevalence of risk factors in pediatric history of currently overweight and obese adults. *Int J Health Sci Res*. 2017; 7(2):202-207.

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