



Assessment of Obesity and Factors Responsible for Obesity among School Going Children

Authors

Ujwal L Yeole^{1*}, Pratiksha D Dighe², Pravin P Gawali³, Roshan G Adkitte⁴,
GauraiM Gharote⁵

¹MPT, Associate Professor, Dept. of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune- 411037
Email: drujwalyeole@gmail.com, Contact no: 9422331831

²Final Year Student, Dept. of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune-411037
Email: pratikshadighe95@gmail.com; Contact no: 7738390275

³Assistant Professor, MPT, Dept. of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune-411037
Email: drpravingawali@gmail.com; Contact no: 9503358020

⁴Assistant Professor, MPT, Dept. of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune-411037
Email: dr.roshanadkitte@gmail.com; Contact no: 9021273004

⁵Assistant Professor, MPT, Dept. of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune-411037
Email: gaurai.gharote@gmail.com, Contact no: 9021273004

Abstract

Purpose: Overweight and obesity is confined not only to adults but also being reported among children and adolescents. This study was done to evaluate the prevalence of obesity and Factors associated to it in school going children.

Methods: A cross sectional study was carried out in schools selected randomly across Pune City. Total 253 school going children were screened among them 100 children satisfying inclusion criteria were recruited. A written consent of the students and school was taken. Questionnaire was explained the students and were requested to fill the questionnaire. The clinical examination of students included assessment of body mass index (BMI) and waist hip ratio (WHR). The students were categorized into underweight, healthy weight, overweight, and obese using WHO approved CDC age specific charts (percentile BMI).

Results: Total 100 school going children 49 female (mean age 14.2) and 51 male (mean age-14.0) were examined. The study showed 13% underweight, 47% healthy weight, 22% overweight and 18% obese students. About 88% populations found to be spending 0-2 hours in watching T.V., 72% spent 0-2 hours in playing video games. Only 16% students were involved in daily playing and 86% students preferred to play outdoors. About 62% mentioned about lack of physical activity in family. Many of the students had snacks as a part of diet which included drinking of sweetened beverages over fruits and vegetables.

Conclusion: Overweight and obese children showed sedentary lifestyle as compared to healthy weight and underweight children. Majority of obese children showed lack of physical activity and unhealthy dietary habits.

Keywords: School going children, Obesity, Healthy lifestyle questionnaire.

Introduction

The world health organization (WHO) describes overweight and obesity as one of today's most important public health problems, which is escalating as global epidemic.^[1] Overweight and obesity is confined not only to adults but also being reported among children and adolescents of developed as well as developing countries.^[2] About 43 million children and adolescents are estimated to be affected with obesity and overweight across the globe and this number is rising exponentially.^[3] The prevalence reported in India in various studies ranges from 8.5 to 29% for overweight and 1.5 to 7.4% for obesity.^{[4],[5]}

Since, adolescence is period of transition from childhood to adulthood; it assumes critical position in life cycle of human beings, characterized by an exceptionally rapid rate of growth.^[2] Body mass is modulated from birth to adulthood by physiological mechanism such as balancing intake, caloric expenditure and energy reserves. Hypercaloric diet and sedentary lifestyle have resulted in the development of obesity in younger populations.

The development of obesity triggers a vicious cycle in which subjects become obese, and systemic repercussion of their disease process make them intolerant to exercise; therefore, they become more sedentary, which promotes additional weight gain. Multisystem dysfunction, an entity previously observed only in adults, has become more common among children and adolescents, resulting in physical exercise intolerance and increasing the prevalence of obesity, which affects the cardiorespiratory system.^{[6],[7]}

Our genetic makeup does not necessarily cause obesity, but it does lower the threshold for the development of the disease (susceptibility genes) and contributes significantly to the variability in weight gain observed among individuals fed identical daily caloric excesses.^[8] The mutation of gene called obese or simply ob, is believed to disrupt hormonal signal that regulate metabolism, fat storage, and appetite, causing energy balance to tip in the direction of fat accumulation.^[9]

A person's risk of developing morbid obesity is often is heavily influenced by psychological factors. Boredom, depression, anxiety, stress, trauma (whether as an adult or a child), and feelings of low-esteem are examples of psychological factors that could result in an individual's overeating of under-exercising.^[10]

Obesity can occur in any age, and generally increases with age. The etiology of obesity is complex, and is one of multiple-causation. Obesity in childhood is associated with increased risk of hypertension, diabetes, coronary artery diseases and osteoarthritis during adult life.^[11] Hence, it is necessary to detect the obesity and factors leading to it at the early age and effectively correct the obesity during childhood and adolescence by advocating some life style changes. This study was done to evaluate the prevalence of obesity in school going children and factors responsible for obesity.

Materials and methods

Study design: Descriptive study

Participants: The participants selected for the study were school going children (both boys and girls) from underweight, healthy weight, overweight and obese category aged between 13-16 years. The students with any physical or mental illness were excluded from the study.

Procedure: The project was approved by Institutional Ethical Committee, Department of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune. Total 216 school going children were screened amongst five different schools selected randomly across the city and 100 children satisfying inclusion criteria were recruited using simple random sampling. Aim and objectives of the study was clearly stated in a cover letter in order to obtain the consent from respondents. The respondents were made clear that the information gathered will be remaining confidential and will be used only for research purpose and written consent was taken.

Healthy Lifestyle Questionnaire was explained and given to each subject. They will be requested to fill the questionnaire. This was followed by clinical examination of subject including height, weight,

body mass index (BMI) examination and waist hip ratio was recorded in both the sexes. The CDC and the American Academy of Pediatrics (AAP) recommend the use of BMI to screen for overweight and obesity in children. The use of percentiles is recommended in children and teens as the amount of body fat differs between boys and girls and body fat also changes with age. The percentile BMI was calculated by using CDC's online Child and Teen BMI Calculator. ^[12] WHO approved CDC age specific chart of BMI was used as reference standards. Children with BMI above 95th percentile were considered obese; those between 85th to 95th percentiles were considered overweight and accordingly were categorized into underweight, healthy weight, overweight, and obese. ^[13]

Results

Out of 100 school going children aged 13-16 years, 49 girls (mean age 14.2) and 51 boys (mean age-14.0) examined, 13 students found to be underweight (15.11±2.15), 47 healthy weight (21.18±3.13), 22 overweight (27.54±4.12) and 18 obese (33.12±4.34). The prevalence of obesity in study population was 18% in which 8% were girls and 10% were boys. The prevalence of overweight and obesity was significantly higher among males than females in present study.

Table.1 indicates that about 88% populations found to be spending 0-2 hours in watching T.V., 72% spent 0-2 hours in playing video games. Only 16% students were involved in daily playing and 86% students preferred to play outdoors. About 62% students mentioned about lack physical activity in family. Many of the students had snacks as a part of diet which included drinking of sweetened beverages over fruits and vegetables.

Discussion

The present cross sectional community based study conducted showed that out of 100 schools going children, Prevalence of obesity in study population was 18%. Increasing prevalence of Childhood obesity is being observed with the changing life style of families with increased purchasing power,

increasing hours of inactivity due to addiction to television, videogames and computer, which have replaced outdoor games and other social activities. ^[10]

It has been suggested that increase in body weight have been caused primarily by reduced levels of physical activity, rather than by changes in excess food intake or by other factors. ^[14] In urban areas, considering the safety of keeping children away from the heavy traffic congestion, parents feel more comfortable, if their children played indoor games or watched television, consequently hindering their children participation in outdoor games or sports.

A person's environment (at home, school, at play in the community etc.) can have a significant impact on his or her risk of developing morbid obesity. His or her environment in this regard would be comprised of, types of food that is available to the individual, the quantity of food available, the level of physical activity available or attainable, and the diet and exercise habits of the individuals. ^[15]

Unhealthy lunch options and regular consumption of high calorie foods, like fast food, cookies and other baked goods, soda, sweetened beverages, candy, chips these all things contribute to weight gain. Parents are key to developing a home environment that fosters healthful eating and physical activity among children and adolescents. ^[16] If the child opens up the refrigerator which is greeted by bags of chips, candy bars and microwave pizza, then they will prefer to it those things only. Similarly, if we keep our fridge stocked instead with fresh fruits and vegetables then children will prefer this healthier option.

A recent study conducted on Assessment of obesity among school going children in urban area of Eluru, Andhra Pradesh, by K Chandra Shekhar, P G Deotale, Siddharth Sankarreddy concluded prevalence of obesity was 9.3%. ^[17] Similar studies done reported the prevalence of obesity in affluent public school children to be 7% in New Delhi, and about 15% in Chennai, Tamil Nadu. ^[18]

Table .1: Factors associated with Obesity

Details of activity	Respondents (%)
Hours of watching television	
0-2 hrs	88
3-5	11
More than 5	1
Hours of playing video games	
0-2	72
3-5.	23
More than 5	5
Outdoor play	
Daily	16
Sometimes	66
Rarely	16
Never	2
Safe to play Outdoor	
Yes	86
No	14
Family do something active	
Daily	0
Sometimes	6
Rarely	32
Never	62
Parent play actively	
Daily	1
Sometimes	18
Rarely	16
Never	21
Daily eating habit	
Breakfast, Lunch, Dinner, Snacks	76
Breakfast, Lunch, Dinner	15
Breakfast, Dinner, Snacks	3
Breakfast, Lunch, Snacks	2
Lunch, Dinner, Snacks	1
Lunch, Snacks	1
Breakfast, Dinner	1
Breakfast, Lunch	12
Eat breakfast everyday	
Yes	59
No	41
Watching T.V. while eating	
Yes	81
No	19
Family eat out each week	
Daily	0
Sometimes	26
Rarely	54
Never	20
Eat fruits and vegetables	
Daily	33
Sometimes	54
Rarely	12
Never	1
Sodas and sweetened beverages	
0	31
1-3.	38
more than 3	31

There are evidences that children and adolescent of affluent families are increasingly becoming overweight and obese in recent times. Involvement

of the entire family into a physical activity rather than involving only child can be more beneficial. Parents must provide support for children to be active like planning weekend activities that get kids exercising or planning family events that get everyone active and encouraging everyone to think of fun things to do to get up and moving, and away from the screens. As been recommended by American College of Sports Medicine in news letter "Fit society", time spent being active as a family is a great way to meet physical activity recommendations while improving family relationships, bonding, and cohesion. ^[19]

India being a country of different religions and cultures, food habits and practices also vary across different regions. Further cross-sectional study is recommended across different regions comparing variations with different cultures, Government and Private schools across India. Assessing physical fitness in relation with obesity in school going children is also recommended in order to promote appropriate health behaviors and exercise regimens amongst school going children.

Acknowledgement

We extend our gratitude towards participants for their consent & co-operation for the study.

Funding

This study is not funded or sponsored by any financial resources.

Conflict of interest: Nil

Source of support: None

References

1. WHO Nutrition [Internet], Available from: <http://www.who.int/nut/obs/ht>. Last accessed in March 2016.
2. Tanner JM. Fetus into man: physical growth from conception to maturity. New York wells, open book publishing limited, 1978: pp 22-36
3. De Onis M, Blossner M, Borghi E. Global prevalence and trends of overweight and obesity among preschool children. *Am J Clin Nutr*. 2010;92:1257-64.

4. Singh RB, Pella D, Mechirova V, et al. Prevalence of obesity, physical activity, and undernutrition, a triple burden of diseases during transition in a developing economy. The five city study group. *Acta Cardiol.*2007 ; Apr; 62(2):119-27.
5. Chatterjee P. India sees parallel rise in malnutrition and obesity. *Lancet*, Dec.2002;360 (9349):1948.
6. Ebbeling CB, Pawlak DB, Ludwig DS. Childhood obesity: Public-health crisis, common sense cure. *Lancet* 2002;360:473-82.
7. Speiser PW, Rudolf MCJ, Anhalt H, et al: consensus statement: childhood obesity. *J ClinEndocrinolMetab.* 2005, 90 (supp 3): 1871-1887.
8. McArdle and Katch and Katch, essential of exercise physiology, body composition, obesity and weight control third edition; 603
9. Freedman DS, Khan LK, Dietz WH, Srinivasan SR, Berenson GS. Relationship of childhood obesity to coronary heart disease, risk factors in adulthood: The Bogalusa Heart Study. *Pediatrics* 2001; 108: 712-718.
10. Singh M and Sharma M 2005. Risk factor for obesity in children. *IndPeadiatr*; 42;823-847
11. Freedman DS, Khan LK, Dietz WH, et al. Relationship of childhood obesity to coronary heart disease, risk factors in adulthood: The Bogalusa Heart Study. *Pediatrics* 2001; 108: 712-718.
12. CDC Calculator [Internet]: Online BMI calculator:, accessed in January 2016, Available from: <http://apps.nccd.cdc.gov/dnpabmi/>.
13. Centers for Disease Control Website, accessed in March 2016, <http://www.cdc.gov/healthyweight/assessing/bmi/childrensBMI/aboutchildrenBMI.html>
14. Aykroyd, W.R. and J.Mayer. Food and nutrition Terminology. In: WHO Doc Nut/68.6, Geneva.
15. Causes of obesity; environmental and psychological factors, www.docshop.com, accessed in February 2016.
16. Ana C Lindsay, Katarina M. Sussner, Juhee Kim, Steven Gortmarker et al. The role of parents in preventing childhood obesity, *Future of Children*, SPRING 2006; vol.16/ No.1/
17. K Chandra Shekhar, P G Deotale, Siddharth Sankarreddy, A Study on assessment of obesity among high school children in urban area of Eluru, Andhra Pradesh, *Indian Journal of Public Health Research and Development*, April-June 2015, vol.6, No.2.
18. Subramanyam V, Jaysree R, Mohmad Rafi. Prevalence of Overweight and Obesity in Affluent girls in Chennai 1981 and 1998, *Indian pediatrics*, 2003.
19. Dixie L. Thompson, ACSM Fit Society Page, *American College of Sports Medicine*, October 2013, vol.15, No.3.