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A Cross-Sectional Study on Prevalence of Obesity in Adolescents

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ABSTRACT

Introduction: Obesity is a life style related metabolic disorder which has significant impact on health. Obesity is affecting children and adolescents, there is an increase in the prevalence of obesity in our country. Obesity leads to development of metabolic syndrome, diabetes mellitus and coronary heart disease. The objective of the study is to find out the prevalence of obesity and overweight among the adolescent population. **Material and Methods**: A cross-sectional study was conducted to find out the prevalence of obesity among adolescents in our population at CCM Medical College Bhilai, Durg. We included a total of 500 school children in the age group of 13-17 years from various schools of Bhilai, CG. A written informed consent was obtained from each participant. A pre-designed and pre-tested questionnaire was used to elicit the information for the study. Anthropometric measurements included body weight, height, mid upper arm circumference. Measurements were recorded by the Investigator using standardized procedures [Jelliff, 1966]. **Result**: In our study, we included a total of 500 adolescents aged between 13-17 years. Body mass index (BMI) was calculated. Out of the 500 adolescents included in our study, 216 had BMI <18.5 kg/m2, 184 had 18.5 - 24.9 kg/m2, 68 had 25-30 kg/m2 and 32 had BMI >30 kg/m2 respectively. The prevalence of obesity was 6.4% and the prevalence of overweight was 13.6%. **Conclusion**: It is essential to maintain good BMI for a healthy lifestyle, our study shows that a large % of the student body has a BMI outside of the normal range the contributing factors include increased use of technology; lack of exercise, increased consumption of fast food. With the growth in household income, we need to keep the focus on maintaining a good lifestyle.

Key Words: *obesity, overweight, prevalence, body mass index, healthy life style and lack of excericise.*

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INTRODUCTION:

The term overweight refers to excess body weight for a particular height whereas the term obesity is used to define excess body fat [1]. Overweight and obesity primarily happen either due to excess calorie intake or insufficient physical activity or both. Furthermore, various genetic, behavioural, and environmental factors play a role in its pathogenesis. Childhood obesity is a forerunner of metabolic syndrome, poor physical health, mental disorders, respiratory problems and glucose intolerance, all of which can track into adulthood [2]. Developing countries like India have a unique problem of 'double burden' wherein at one end of the spectrum we have obesity in children and adolescents while at the other end we have malnutrition and underweight. Globally, the prevalence of childhood obesity has risen in recent years. The International Association for the Study of Obesity (IASO) and International Obesity Task Force (IOTF) estimate that 200 million school children are either overweight or obesity [3].

Lower BMI (body mass index) cut-offs of 23 and 25 kg/m^2 have been suggested by the World Health Organization (WHO) and IOTF for Asian Indian adults for overweight and obesity, respectively but these are not applicable for children and adolescents. Over the years, there has been a lack of consensus on the various cut-points or definitions used to classify obesity and overweight in children and adolescents. This makes it difficult to interpret and compare the global or national prevalence rates [4-10]. There is lack of national representative data on obesity in children from India with its widely varying geographical, social and cultural norms. We have taken up the present study to find out the prevalence of obesity among children and adults.

OBJECTIVES OF THE STUDY

The objective of the present study is to estimate the prevalence of obesity among adolescents in our population.

MATERIALS AND METHODS

A cross-sectional study was conducted to find out the prevalence of obesity among adolescents in our population at CCM Medical College Bhilai, Durg. We included a total of 500 school children in the age group of 13-17 years from various schools of Bhilai, CG. A written informed consent was obtained from each participant. A pre-designed and pre-tested questionnaire was used to elicit the information for the study. The general information on individual characteristic like age, sex, ordinal position, education, school and residential address with contact number and family characteristics like family size, type of family, religion, caste, mother tongue, parents' education ((High School, Graduate, Post Graduate), occupation and income, details about family members, total income of the family, living conditions at home, Time spent in sleep (number of hours /day), Time spent in study (number of hours /day), Time spent in Technology (number of hours /day), Time spent in exercise (number of hours /day), calorie intake/day, calories deficiency and frequency of fast food per week. The specific information on teenager's daily activities, TV viewing behaviour pattern, eating habits while watching TV were included.

Anthropometric measurements included body weight, height, mid upper arm circumference. Measurements were recorded by the Investigator using standardized procedures. Body weight was measured to the nearest to 100g with minimal clothing and without shoes, using portable personal weighing balance. Height was measured to the nearest cm with subject in the full standing position without shoes using stature meter. Mid-upper arm circumference was taken at biceps using non-stretchable measuring tape. BMI-for-age and sex appropriate z-score classification was used as indicator to classify underweight, normal weight, overweight and obesity.

Body fat analysis was carried out using bioelectrical impedance technique which is based on the principle that electric current flows at different rates through the body depending upon its composition. The body is composed mostly of water with ions, through which an electric current can flow. On the other hand, the body also contains non-conducting materials (body fat) that provide resistance to the flow of electric current. Adipose tissue is significantly less conductive than muscle or bone. The principal of BIA is that electric current passes through the body at a differential rate depending on body composition. Hence, there is a direct relationship between the concentrations of ions and the electrical conductivity and an indirect relationship exists between the ion concentration and the resistance of the solution. The procedure is as follows: a. Participant stands on the machine barefoot b. low-grade current enters body c. impedance to current offered by tissue is measured d. impedance offered depends on the moisture content of the tissue e. difference in impedance is translated into percentage of tissue in body.

STATISTICAL ANALYSIS

The collected data were analysed using IBM SPSS Statistics 19 version. The prevalence of underweight, overweight and obesity was calculated under each gender and age.

RESULTS AND DISCUSSION:

In our study, we included a total of 500 adolescents aged between 13-17 years. Body mass index (BMI) was calculated.

Table 1: Shows Distribution Body Mass Index (kg/m^2) among the Adolescents

	BMI	No of Students	Percentage
Group 1	<18.5 kg/m^2	216	43.2
Group 2	18.5 - 24.9 kg/m^2	184	36.8
Group 3	25-30 kg/m^2	68	13.6
Group 4	>30 kg/m^2	32	6.4

Out of the 500 adolescents included in our study, 216 had BMI <18.5 kg/m^2, 184 had 18.5 - 24.9 kg/m^2, 68 had 25-30 kg/m^2 and 32 had BMI >30 kg/m^2 respectively. The prevalence of obesity was 6.4% and the prevalence of overweight was 13.6%.

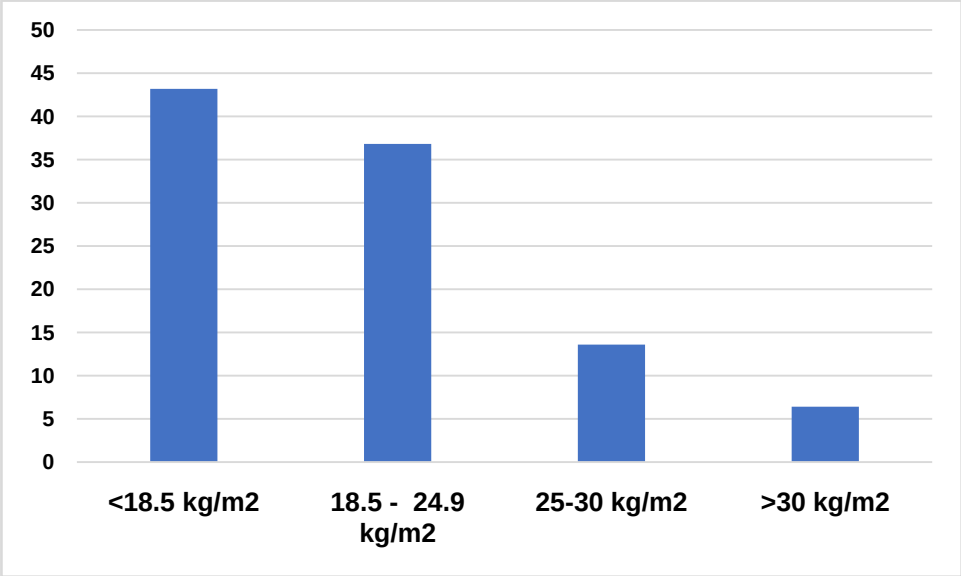

Figure 1: Shows Distribution Body Mass Index (kg/m^2) among the Adolescents

In the present study, we evaluated the prevalence of obesity among adolescents in the age group 13-17 years. We found the prevalence of 6.4% and overweight 13.6% respectively which was consistent with a recent study [9]. However, the National Nutrition Monitoring Bureau surveys in 2002, in rural areas, reported the prevalence of as little as 0.6% [7]. A similar study done in Hyderabad showed that the prevalence of overweight was 7.2% among the 12 to 17-year age group [10]. Although, some other studies done in India showed a higher prevalence of overweight and obesity[11-14]. A study in Delhi on affluent school children showed the prevalence of obesity to be 7.4% [15]. Another study among affluent girls in Delhi reported the prevalence of obesity and overweight to be 5.3 and 15.2%, respectively [16]. Similar studies had been conducted to assess the prevalence of overweight and obesity in India and the results are comparable to our study, with respect to the prevalence of obesity [17]. A study done in USA during 2001–2002 showed the prevalence of overweight and obesity as 31.5 and 16.5%, respectively, for the 6 to 19-year age group [16]. The widely differing prevalence of overweight and obesity was due to the definitions used, age group and sex taken for the study, uniformity of selection of the sample, area selected, and the methodology used for the survey. Overweight and obesity were marginally higher in the pubertal age groups of 13 to 15 years, perhaps because of increased adipose tissue and overall body weight in children during puberty. One of the major reasons for childhood obesity was watching television or using computers as shown by another study [10]. The studies on determinants of Adolescent obesity clearly stated that more hours of TV viewing, lack of sleeping time, physical inactivity, high socioeconomic status and dietary transitions were major lifestyle factors causing overweight and obesity among adolescents. BMI is positively correlated with body fat, as evidenced in our study that, those who had increased BMI had increased body fat as compared to those with BMI less than 18.5 kg/m^2.On the other hand, we know that malnutrition is a double edge sword. Whereas adolescents from families of elite higher income group are having higher BMI. Their lifestyles are luxurious with increased consumption of junk food. These adolescents come to school in lavish cars and have limited exercise. Adolescents coming from middle class families are coming to school in their bicycles which itself is a good exercise. Also, these adolescents had clinical anaemia due to under nutrition hence BMI is less than 18.5 kg/m^2.

CONCLUSION

It is essential to maintain good BMI for a healthy lifestyle, Our study shows that a large % of the student body has a BMI outside of the normal range the contributing factors include increased use of technology; lack of exercise, increased consumption of fast food. With the growth in household income, we need to keep the focus on maintaining a good lifestyle.

REFERENCES

1. National Institutes of Health, & National Heart, Lung, and Blood Institute. (2010). Disease and Conditions Index: what are overweight and obesity. Bethesda, MD: National Institutes of Health.
2. Centers for Disease Control and Prevention (CDC). Fact sheets.[accessed on November 22, 2013].
3. International Obesity Task Force. [accessed on November 22, 2013].
4. Ogden, C. L., Carroll, M. D., Curtin, L. R., Lamb, M. M., & Flegal, K. M. (2010). Prevalence of high body mass index in US children and adolescents, 2007-2008. Jama, 303(3), 242-249.
5. Wang, Y., & Lobstein, T. I. M. (2006). Worldwide trends in childhood overweight and obesity. International journal of pediatric obesity, 1(1), 11-25.
6. Raj, M., & Kumar, R. K. (2010). Obesity in children & adolescents. Indian Journal of Medical Research, 132(5), 598-607.

Goyal, R. K., Shah, V. N., Saboo, B. D., Phatak, S. R., Shah, N. N., Gohel, M. C., ... & Patel, S. S. (2010). Prevalence of overweight and obesity in Indian adolescent school going children: its relationship with socioeconomic status and associated lifestyle factors. The Journal of the Association of Physicians of India, 58, 151-158.

7. Laxmaiah, A., Nagalla, B., Vijayaraghavan, K., & Nair, M. (2007). Factors affecting prevalence of overweight among 12-to 17-year-old urban adolescents in Hyderabad, India. Obesity, 15(6), 1384-1390.
8. Aggarwal, T., Bhatia, R. C., Singh, D., & Sobti, P. C. (2008). Prevalence of obesity and overweight in affluent adolescents from Ludhiana, Punjab. Indian pediatrics, 45(6), 500.
9. National Nutrition Monitoring Bureau. Diet and nutritional status of rural population national institute of nutrition. India: Indian Council of Medical Research Hyderabad; 2002.
10. Ramachandran, A., Snehalatha, C., Vinitha, R., Thayyil, M., Kumar, C. S., Sheeba, L., ... & Vijay, V. (2002). Prevalence of overweight in urban Indian adolescent school children. Diabetes research and clinical practice, 57(3), 185-190.
11. Chatterjee, P. (2002). India sees parallel rise in malnutrition and obesity. The Lancet, 360(9349), 1948.
12. Kaur, S., Kapil, U., & Singh, P. (2005). Pattern of chronic diseases amongst adolescent obese children in developing countries. Current science, 1052-1056.
13. Khadilkar, V. V., & Khadilkar, A. V. (2004). Prevalence of obesity in affluent school boys in Pune. Indian Pediatr.
14. Kapil, U., Singh, P., Pathak, P., Dwivedi, S. N., & Bhasin, S. (2002). Prevalence of obesity amongst affluent adolescent school children in Delhi. Indian pediatrics, 39(5), 449-452.
15. Mehta, M., Bhasin, S. K., Agrawal, K., & Dwivedi, S. (2007). Obesity amongst affluent adolescent girls. The Indian Journal of Pediatrics, 74, 619-622.
16. Kaneria Y, Singh P, Sharma DC(2006). Prevalence of overweight and obesity in relation to socio economic conditions in two different groups of school age children of Udaipur city (Rajastan) J Indian Assoc Community Med; 7:133–5