ORIGINAL ARTICLE

PREVALENCE OF OVERWEIGHT AND OBESITY IN PRIMARY SCHOOL CHILDREN

Jagdish Dubal

Assistant Professor, Department of Paediatrics, Gujarat Adani Institute of Medical Science, Bhuj, Gujarat

ABSTRACT:

Introduction: The emerging epidemics of obesity, cardiovascular disease (CVD) and diabetes form the crux of this phenomenal change. Among these entities, obesity has become a colossal epidemic causing serious public health concern and contributes to 2.6 million deaths worldwide every year. **Material & Method:** A cross-sectional study was conducted on a sample of students who attended government schools during the second school term between January 2010 to April 2010. Sample size consists of 2500 students covering the 3 socioeconomic classes so that the sample taken from each socioeconomic class is near to the percent of population for this class. **Result & Conclusion:** This study found a relatively high prevalence of overweight and obesity among 6–12 year-old children. Socioeconomic class, faulty dietary habits, sedentary life style, low level of physical activity, and finally parental BMI showed a strong association with the BMI of students. Decreased rate of obesity with an increase in age in our study signifies faulty feeding habits were the highest at lower ages. Increased awareness about childhood overweight/obesity through publications and symposia for parents is important.

Keywords: Obesity, Children, BMI

Corresponding author: Dr. Jagdish Dubal, Assistant Professor, Department of Paediatrics, Gujarat Adani Institute of Medical Science, Bhuj, Gujarat

This article may be cited as: Dubal J. Prevalence of Overweight and Obesity in Primary School Children. J Adv Med Dent Scie Res 2015;3(6):S58-S61.

INTRODUCTION:

In the last decade the estimated number of adults with excess weight has increased dramatically, from 200 million to 300 million affected individuals worldwide. Since 1980 obesity rates have risen three fold or more in some areas of North America, United Kingdom, Eastern Europe, Middle East, The Pacific Islands and Australia.[1] In developing countries the prevalence of obesity also exhibited a dramatic increase, obesity now being present in 60% of women and 50% of men in many of these countries. The percentage of overweight children and adolescents also increased, by almost 50%, in the last two decades of the 20th century.[2]

Worldwide, disease profiles are transforming at a rapid pace catching the attention of medical professionals and policy makers alike.[3] This is particularly true in low and middle-income countries that form the major chunk of global population. The emerging epidemics of obesity, cardiovascular disease (CVD) and diabetes form the crux of this phenomenal change. Among these entities, obesity has become a colossal epidemic causing serious public health concern and contributes to 2.6 million deaths worldwide every year.[4]

Obesity is an independent risk factor for CVD. Obesity is associated with an increased risk ofmorbidity and mortality as well as reduced life expectancy. The last two decades of the previous century have witnessed dramatic increase in health care costs due to obesity and related issues among children and adolescents.[5]

Childhood obesity affects both developed and developing countries of all socio-economic groups, irrespective of age,sex or ethnicity.[6] It has been estimated that worldwide over 22 million children under the age of 5 are obese, and one in 10 children is overweight. A wide range of prevalence levels exist, with the prevalence of overweight in Africa and Asia averaging well below 10 per cent and in the Americas and Europe above 20 per cent. The proportion of school-age children affected will almost double by 2010 compared with the most recently available surveys from the late 1990s up to 2003.[7]

Overweight and obesity in childhood have significant impact on both physical and psychological health; for example, overweight and obesity are associated with hyperlipidemia, hypertension, abnormal glucose tolerance, and infertility.[8] In addition, psychological disorders such as depression occur with an increased frequency in obese children. This study focused on prevalence and risk factors for obesity in covering all socioeconomic classes.

MATERIALS & METHOD

A cross-sectional study was conducted on a sample of students who attended government schools during the second school term between January 2010 to April 2010. Sample size consists of 2500 students covering the 3 socioeconomic classes so that the sample taken from each socioeconomic class is near to the percent of population for this class.A multistage random sampling technique was used to select a sample. In this type of sampling we combined more than one sampling technique. Then inside each school, pupils were chosen out of different school grade strata by selecting the students sitting in the middle three desks from each row of all classes of the whole school. Permission was obtained from heads of educational directorates. Then the researcher visited the chosen schools to inform them about the survey. All the classes from the first to the sixth grade in each selected school were included in the study. Systematic randomization was used to select the sample where the students in the middle three desks from each row in each class were chosen to give them the consent form.

After having got the agreement consent, the researcher measured the height, and weight for each student in the examination room of the school. The researcher himself did all measurements and the assistant did the registration; and then the students were asked to take the questionnaire to their homes to be filled by one of their parents or guardians and to bring it back the next day.

The filled questionnaires were collected on the next day and defaulters were asked to bring it on the following day. Inclusion and exclusion criteria Students aged between 6 and 12 years were included, while students less than 6 or more than 12 year of age were excluded.

Children with chronic illness as well as those on corticosteroid therapy or growth hormone replacement therapy and children with chromosomal disorders were excluded. A self-administered questionnaire was used. The questionnaire had two sections; the first section was filled in the school by the assistant, including personal information: age, grade, gender, date of birth, school name in addition to anthropometric measurements. The second section was filled by one of the parents. The section was concerned about frequency of eating fast food, drinking carbonated beverages, information about the sedentary/activity level of individual, socioeconomic status of family, and information about parents such as weight, height, in addition to information about the sedentary/activity level of individual. The researcher personally took different anthropometric measurements at the examination room, after instructing the students to take off heavy clothes. One suitable weight balance measuring to nearest 0.5 kg was used. Students were weighed while wearing light school uniform. Suitable metallic meter scale measuring to the nearest 0.5 cm, fixed on the scale was used.

Coded data were computerized, and analyzed using SPSS (version 11 Inc. Chicago). So the study descriptive statistics were presented in frequency tables, median, minimum, maximum, mean and standard deviation, whenever appropriate. Normally distributed data were compared using Student's t-test for 2 groups and ANOVA test for more than 2 groups. On the other hand, non-parametric tests were used for abnormally distributed data; Mann–Whitney test was used to compare two groups and Kruskall–Wallis test for more than 2 groups. Significance level of 0.05 is used.

RESULTS

Out of 2500 children screened, 1800 responded to the questionnaire and were enrolled in the study. Out of 1800 students, 1000 (60.8%) were males, while 800 (39.2%) were females, with a mean age of 12 ± 4 years. The mean and standard deviation of anthropometric measurements were as follows: weight: 42.12 ± 10.6 kg, height: 120.4 ± 16.7 cm and BMI: 30.3 ± 7.2 kg/m2 . Out of the 1800 participants, 19.4% (350 students) were overweight, 13.5% (250 students) were obese, and 66.8% (1200 students) represented normal and underweight children. The frequency of overweight and obesity peaks among socioeconomic classes is shown in Table 1. The rate of obesity was the highest at the age of 7– 8 years (grade 2) and decreased with an increase in age, while overweight increased with an increase in age to be the highest at the age of 9–10

(grade 4) and 10–11 (grade 5). Several variables were tested to determine their effect on BMI. The variables included socioeconomic class of the family, dietary habits, physical activity and family history of obesity and overweight. Our data showed a significant association between socioeconomic class and BMI, (p = 0.047) and showed that faulty dietary habits; having more fast food, candy, chocolates, sugary Juices, and carbonated beverage lead to a higher BMI (p value < 0.001). Data showed that playing any kind of sport like biking, swimming or football regularly is strongly associated with fewer incidence of overweight and obesity (P value < 0.001).

Table 1: Frequency of overweight and obesity among different socioeconomic class

	High standard	Middle standard	Low standard	Total
Overweight no.	100	150	100	350
Obesity no.	50	100	100	250

DISCUSSION:

In the present study, the overall prevalence of obesity among children aging from 6 to 12 years was 13.5%, while the overall prevalence of overweight was 19.7%. No previous studies were carried out in at this age group which makes it difficult to compare. A previous Egyptian study mediated by Hafez et al. showed a prevalence of overweight and obesity of 11%, and 3.8% respectively, among children of governmental school in Cairo. On the other hand higher values were detected among children of private schools with percentage values of 21%, and 12.9% for obesity and overweight, respectively. The prevalence of obesity and overweight in our study was higher than values described by Hafez et al. among children of governmental school. This variation might be partially attributed to the difference in standard curves used for defining obesity and overweight as Hafez et al. used the American standard curve.[9]

In children, a significant association between excess weight and asthma incidence has been observed. Population surveys do suggest that persons with asthma are disproportionately obese compared with persons who have never had asthma.[10] Weight-loss studies on the basis of behavioral change and bariatric studies have shown substantial improvements in the clinical status of many obese patients with asthma who lost weight.[11] Orthopedic complications of obesity are believed to be largely of mechanical nature. During childhood, slipped capital femoral epiphysis, Legg-Calve-Perthes disease, and genu valgum tend to be more common in obese subjects. Orthopedic disorders such as Blount's disease (tibia vara) and slipped capital femoral epiphysis are frequently seen in obese adolescents. Also, overweight children are more likely to have persistent symptoms 6 months after an acute ankle sprain suggesting increased risk of chronic orthopedic morbidity in obese following acute injury.[12]

Genetic conditions known to be associated with predilection forobesity include Prader-Willi syndrome, Bardet-Biedl syndrome, and Cohen syndrome. Obesity clearly demonstrates a familial tendency. The Avon Longitudinal Study demonstrated that the odds of children aged 7 becoming obese if the father, mother or both had obesity were 2.93, 4.66 and 11.75, respectively showing clearly the dominant influence of parental obesity. Before 3 yr of age, parental obesity is a stronger predictor of obesity in adulthood than the child's weight status.[4]

The results of several studies conducted in developed countries showed an inverse association or relation between the income, wealth, mother's education, and overweight/obesity. On the other hand, in developing countries a direct association was seen. In this study, socioeconomic class showed a significant direct association (p value 0.047) with BMI, as both overweight, and obesity were more prevalent among the children from high socioeconomic class. In accord with these results; the study done by Chakar et al. in Lebanon, Khader et al. in Jordan and Mo suwan et al. in Thailand showed that boys and girls in the high income families had higher mean BMI levels.

CONCLUSION:

This study found a relatively high prevalence of overweight and obesity among 6–12 year-old children. Socioeconomic class, faulty dietary habits, sedentary life style, low level of physical activity, and finally parental BMI showed a strong association with the BMI of students. Decreased rate of obesity with an increase in age in our study signifies faulty feeding habits were the highest at lower ages. Increased awareness about childhood overweight/obesity through publications and symposia for parents is important.

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Source of support: Nil

Conflict of interest: None declared