Research Article

An epidemiological study to find the prevalence and socio-demographic profile of overweight and obesity in private school children, Mumbai

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Abstract

Background: As developing societies industrialize and urbanize, and standards of living continue to rise, weight gain and obesity are now becoming a growing threat to the health of the future citizens.

Objective: To find the prevalence of overweight and obesity and socio-demographic factors among children in private schools of an urban area.

Methods and Material: A cross-sectional study, conducted in all private schools present in the Sion area. Age group selected was 13–15 years. Data were collected using semi-structured self-administered questionnaire schedule. Data were related to information about socio-demographic factors, anthropometric measurements (height, weight) of study subjects to calculate body mass index, and certain risk factors of obesity and overweight. Analysis was done by using chi-square test.

Results: There were 44.2%, 49.3%, and 18.1% students overweight and obese in 13 years, 14 years, and 15 years of age, respectively. The prevalence of overweight and obesity in children was 31.1% and 5.7%, respectively. More than half number of school children belonged to the upper-middle (35.3% and upper-lower (28.7%) economic class, who ate fast foods, noodles, snacks, pastries, butter, ice-cream, fizzy drinks, chocolates, milk, and non-vegetarian food particularly chicken and fish from outside.

Conclusions: The nutritional transition, lifestyle, and popularity of fast food, fizzy drinks, sedentary behavior, lack of sport, increased TV/computer watching and working parents are risk factors.

KEY WORDS: Overweight, obesity, body mass index, children

Introduction

The presence of plump children in some communities reflects positively on the man's ability to be a good provider and on the women as a good mother and cook. These additional perceptions are changing as developing societies embrace the more dominating western economic culture and social mores.[1] The increasing prevalence of obesity in a population is an early indicator of an emerging health burden due to the increasing mortality and morbidity from non-communicable disease in developing countries.[2] Paradoxically coexisting with under nutrition, an escalating global epidemic of overweight and obesity—Globesity—is taking over many parts of the world. The 2002 world health report lists "overweight" as the fifth most serious risk factor for both developed and developing countries. Childhood obesity is forecast to increase dramatically in most parts of the world over the next few years.

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Materials and Methods

The present cross-sectional study was conducted in all 10 private schools present in the vicinity of Sion. Age group selected was 13–15 years as children in that age group would be able to communicate and answer in a proper way. Since that was the age of adolescence and at this stage lot of eating, physical activity patterns developed, and they do become conscious of their own body weight.

Statistics

Only six schools gave permission to conduct the study. The school had 1323, 1429, and 1319 students respectively in each standard. Sampling units were selected by using systematic random sampling method. Sample size was 897 students.

First student was selected by random sampling method. This process was continued till all the students were covered or the desired sample size was obtained or whichever was later. Predesigned and pretested questionnaire was used. The questionnaire was explained to students beforehand. The information about identifying data and socio-demographic factors and anthropometric measurements (height and weight) of children was collected using a semi-structured questionnaire schedule by personal interview method. Data of 897 students were collected, compiled, and then entered in MS EXCEL 2003 worksheet and analyzed by SPSS 10.0.

Height was measured in centimeters against a tape fixed to a vertical wall with participant standing on firm surface**.** Weight was measured in kilograms using a calibrated spring balance weighing scale placed on hard, smooth, horizontal surface.

Results

Distribution of students in each class was homogenous. There were 43.1% male and 31.1% female students in 13 year age, 29% male and 31.9% female students in 14 years of age, and 27.9% male and 37% female students in 15 years of age.

There were 44.2%, 49.3%, and 18.1% students overweight and obese in 13 years, 14 years, and 15 years of age, respectively. There was a significant increase in overweight and obesity seen from 13 to 14 years of age.

Prevalence of overweight and obesity had significant association with age. As the age increases from 13 to 14 years, prevalence of overweight and obesity also rises steeply with age and the difference was found to be statistically significant. As the 13 years would be pubertal age, there was an increase in overweight and obesity seen from 13 to 14 year of age.

The high prevalence of overweight and obesity in adolescents is important because obese adolescents become obese adults, thus increasing risk of various diseases. The prevalence of overweight and obesity was 31.2% and 5.7%, respectively in private school children aged 13–15 years in the study area. This study showed that 38.3% of male children were overweight as compared to female that is 26.1% and 7.5% female children were obese as compared to male that is 2.1%. The difference was statistically highly significant. The reason may be that the females restrict their activity from any outdoor activity during pubertal age. It showed that 79.2% of overweight and obese students' fathers were educated up to pregaduate level, 7.4% were educated up to primary level, 48.5% were educated up to secondary level, and 47% were educated up to graduate level. The above difference was found to be significant.

In the study, 51.5% of overweight and obese students' fathers' occupation was business, 38.7% were manual laborer, 12.5% were in service sector, and 32.8% were in other occupational category. The difference was statistically significant.

In the study, there were more number of overweight and obese students belonging to the upper-middle and upper-lower class status, and education of their fathers was up to pregraduate level and occupation of the fathers was business. All the findings of study were found to be statistically significant.

Discussion

O'Malley found that the children in 8th, 9th, and 10th grade in the United States were at risk of overweight and obesity at 23%, 32%, and 27%, respectively. High rates of tracking of overweight and obesity from childhood to adulthood are also reported from other longitudinal studies.[5]

Similarly a school-based study in Chennai done on adolescents girls 10–15 years old found that more number of female children were obese, while more number of male children were overweight.[1]

Mohan et al. found that in Ludhiana the prevalence of overweight and obesity was 11.64% and 2.35%, respectively in healthy adolescent children aged 11–16 years.[6] Kaneri et al. found that in Udaipur city the prevalence of overweight and obesity was 3.25% and 3.73% in school children aged 12–17 years. This increased in the prevalence of overweight and obesity is due to pubertal age.[3]

Ms. Flower study conducted in Ernakulam on school children in adolescent group found that the prevalence of overweight and obesity was 24% and 10.5%, respectively.[12]

Kapil et al. had also reported 7.4% of prevalence of obesity and 24.7% of overweight, in one of the public school of Delhi in the 10–15 years of age group.[5]

Sheetal et al. study conducted in New Delhi among school children of six schools using NHANES III criteria found that 6.22% of children were found to be obese and 8.24% were overweight. O'Malley found that in the United States the proportions of overweight and obesity were 32% and 27% in school children.[13]

Kaneri et al. proved that there was a significant increase in overweight (3.25%) in affluent groups compared to non-affluent groups. These comparative data delineate that the obesity is increasing in affluent population.[18]

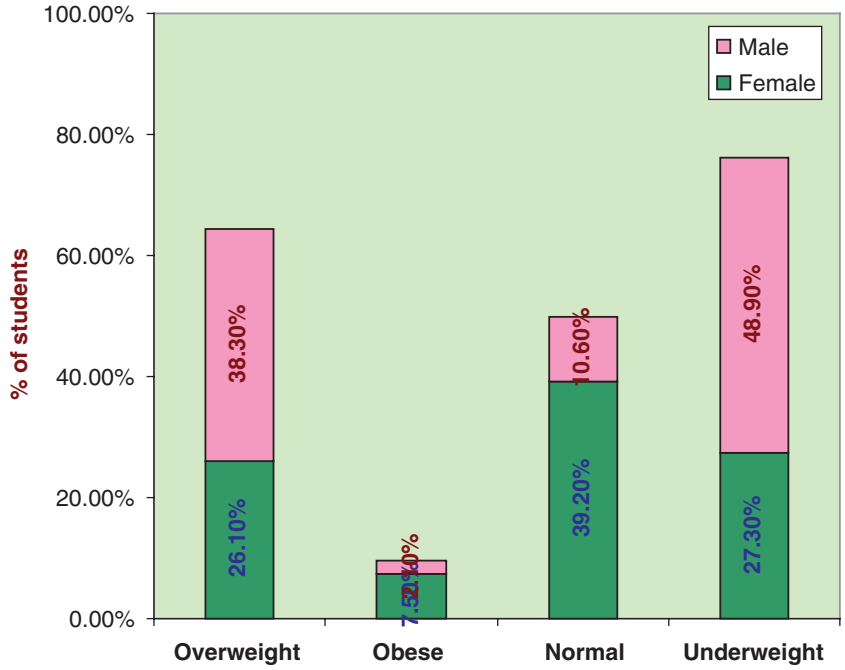

Figure 1: Categorization of students according to BMI.
Chi-square = 115.9; df = 3; p = 0.000 significant.

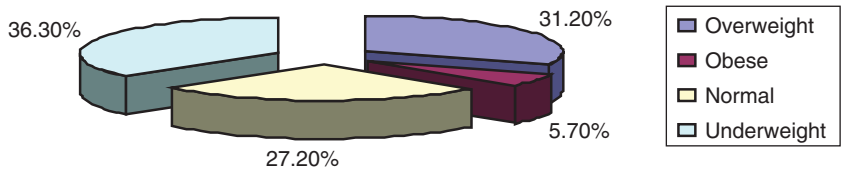

Figure 2: Prevalence of overweight and obesity.

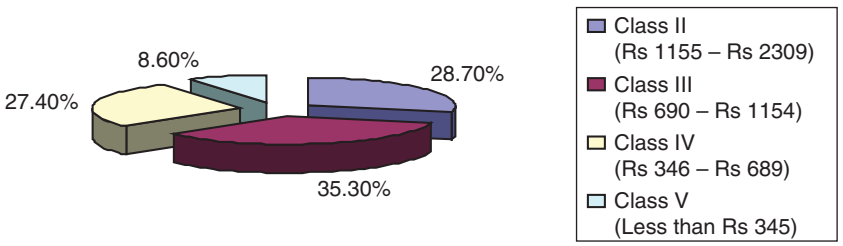

Figure 3: Distribution of children according to socioeconomic status of the family.
Chi-square = 319.577; df = 3; p = 0.000 significant.

Table 1: Association of education of father and overweight and obesity in school children

Fathers' education	Total number of students No.%		BMI (I + II) (overweight & obese) NO.%		BMI (III + IV) (Nonoverweight & Nonobese) NO.%	
Illiterate	113	100	079	69.9	034	30.1
Primary	379	100	028	07.4	351	92.6
Secondary	311	100	151	48.5	160	51.5
Pregraduate	077	100	061	79.2	016	20.8
Graduate	017	100	008	47.0	009	52.9
TOTAL	897	100	327	36.4	570	63.5

Chi-square = 274.099; df = 4; $p = 0.000$ significant.

Table 2: Association of occupation of father and overweight and obesity in school children

Fathers' occupation	Number of students No.%		BMI (I + II) (overweight & obese) NO.%		BMI (III + IV) (nonoverweight & nonobese) NO.%	
Unemployed	62	100	24	38.7	38	61.3
Manual labourer	199	100	83	41.7	106	55.8
Business	301	100	155	51.5	146	48.5
Service sector	208	100	26	12.5	182	87.5
Others	119	100	39	32.8	80	67.2
Total	889	100	327	36.8	562	63.2

Chi-square = 84.283; df = 4; $p = 0.000$ significant.

Sheetal et al. found that there was a noticeable difference between prevalence of obesity in upper-middle income group (10.28%) and lower-middle income group (0.48%).

Sharma et al. found that the majority of students from government school were from lower socioeconomic status because education was almost free and more number of upper-middle and upper-lower were from private schools.[1]

Conclusion

In the study, prevalence of overweight and obesity is 31.2% and 5.2%, respectively. This number is an eye opener to us. It gives an idea about magnitude of the disease burden on society at present and in future in terms of suffering from chronic disease complications, economic cost associated with disease complications, and loss of productive years of life due to early morbidity and mortality associated with disease. It also puts major burden on health-care delivery system where we are still fighting with malaria, tuberculosis, and malnutrition. We are now double jeopardized with this added non-communicable disease burden, especially overweight and obesity.

Better education means better job and therefore better socioeconomic status, and hence it also reflects the rearing up practices at home. A person with better education may want to bring up his children with better food. They provide their children with pocket money so that they may eat more from outside, especially junk foods, etc. As the income increases, prevalence of overweight and obesity in children too increases steadily. Many other Indian studies indicated that urban children from upper socioeconomic status were at almost twice the risk of developing overweight and obesity as compared to lower socioeconomic group.[10]

Recommendations

Reduce the amount of time children spend watching television, video games, and the Internet, decrease the consumption of energy-dense, high-sugar/high-fat foods like soda, ice cream, junk food, and fast food, and increase the consumption of nutritious foods such as fruits, vegetables, whole grains, and skim milk.

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