



A study on Childhood Obesity amongst secondary school children in an urban setting

KEYWORDS

childhood obesity, overweight, BMI, obesity, school children.

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ABSTRACT *Childhood obesity is on the rise and has reached epidemic proportions in both developed and developing countries. The aim of the study was to estimate the prevalence of childhood obesity amongst secondary school children in an urban area of Mumbai, India. The study was a multi-centred study carried out in secondary schools in an urban area of Mumbai, India. Subjects were selected by cluster sampling and total sample size was 300. The subjects were assessed for height, weight, BMI and BMI percentile. Obesity and overweight were highest in the age group 14-17 years and more girls were obese than boys ($p = 0.0321$). Age cut off of 14 years was not significant for obesity. Age and gender are important demographic indicators for childhood obesity and need to be further explored along with other factors that may contribute to childhood obesity.*

INTRODUCTION

Childhood obesity has reached epidemic proportions globally. World Health Organization (WHO) reported that 22 million children under the age of 5 are overweight and progressing steadily to obesity.¹ The nationally representative data on childhood obesity in India and Asian countries is scarce. In fact many third world countries currently are in rapid epidemiological transition as far as childhood obesity is concerned.² Very few epidemiological studies in children exist and the studies available put the prevalence of childhood obesity at between 4-20% across both sexes while the prevalence of overweight children is 15-50%.³⁻¹¹ Children who are obese are thrice as likely to be obese when they are adults. In fact it is now recognized that the true prevention of adult obesity starts with the prevention of childhood obesity amongst school children.¹² Changing lifestyles, increasing purchasing power, fast food availability and increased academic pressure with decreased time for outdoor activities and play along with a host of maternal, child and family factors contribute to the development of childhood obesity.¹³⁻¹⁴ There is also a myth prevalent in India that a chubby child is a healthy child resulting in children being excessively fed and childhood obesity being on the rise.¹⁴ The present study was aimed at elucidating the prevalence and demographics of childhood obesity and overweight children in an urban school cohort from Mumbai.

METHODOLOGY

The study was a multi-centred study carried out in secondary schools in an urban area of Mumbai, India. Students studying between the 6th and 10th standards in these schools made up the sample for the study. Students whose parents did not consent were excluded from the study.

A sample size of 300 was calculated and Cluster sampling was used to select the subjects for the study. Schools from the selected urban population will be selected. One school was to be one cluster. The cluster was selected

by lottery method. After selecting a particular cluster, 60 students were randomly selected from each cluster with 30 being boys and 30 being girls. Clusters are randomly selected until sample size is reached. Thus a total of 5 schools were randomly chosen to reach the target sample of 300. The sample size was calculated by the following formula:

$n = \frac{4 \times P \times Q}{d^2}$ where n = sample size, P = prevalence estimated from previous studies,

$d^2 = 100 - P$, d = confidence interval (d = 5 at 99% confidence level).

(As per previous studies – $\frac{4 \times 24 \times 76}{25} (100-24) =$ nearly 291 hence a sample of 300.

Height, weight, BMI (Body Mass Index) and BMI percentile was calculated. The BMI percentile was calculated as per charts of WHO.¹⁵ Parental consent from students was obtained for the study. The consent of the principal of the schools in the study was also obtained and the study was approved by the Institutional Ethics Committee. Students whose parents did not consent were excluded from the study.

RESULTS

Out of 300 students who participated in the study, 26 (8.67%) were obese, 48 (16%) were overweight, 65.66% were normal while 9.67% were undernourished. Out of 150 girls who participated in the study, 15 (10%) were obese, 30 (20%) were overweight, 61% were normal and 9% were undernourished. Out of total 150 boys who participated in the study, 11 (7.33%) were obese, 17 (11.33%) were overweight, 70% were normal and 11% were undernourished. When gender was considered a variable for obesity and overweight it was noted that girls were having significantly greater obesity than boys ($X^2 = 4.5922$, $p = 0.0321$) (Table 1). No significant difference was found when age below or

above 14 years was a variable. Obesity was maximum between the age of 15 to 17 years being 14% in this group and overweight was highest at a rate of 15-18% between 14 to 17 years of age. (Table 2).

DISCUSSION

In the present study the prevalence of overweight and obesity was 16% and 8.67% respectively. Similar findings have been reported from other studies in different cities of India (Delhi^{5,7}, Chennai⁸, Pune⁶, Mysore, West Bengal⁴, Punjab³, Mysore¹² and Wardha¹¹) with prevalence rates being between 4-20% for obesity and 15-50% for overweight. Girls in our study had a significantly higher prevalence of obesity. This has been reported in two childhood obesity studies conducted in Hyderabad¹⁶ and Puducherry.¹⁷ This has been hypothesized to be related to hormonal changes as well as puberty along with genetic and constitutional factors. In our study, where the adolescent age group was studied, it was found that prevalence of obesity went on increasing with age and maximum at 15-16 years. The same trends were seen post 14 years of age with overweight. The probable cause can be increasing studies in older students, restricted physical activities along with the onset of puberty and decreased physical activity in this group.¹⁴ Thus, age and gender are important demographic indicators of childhood obesity.

The strength of our study remains in the fact that it provides an estimate of childhood obesity among a representative sample of secondary school children. It also indicates the need for further large scale school based epidemiological estimations and the need to devise meaningful preventive programmes for childhood obesity at a school level. The limitations of the study include a circumscribed data and small sample size while failing to study factors that may contribute to childhood obesity in the population studied. We did not look at differences in BMI and weight in kg. There is dearth of epidemiological data from urban metros on childhood obesity where the trends are alarming and this study paves the way for future work in this arena.

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Table 1 – Effect of gender on obesity and overweight in the subjects

Weight Range	Boys (n = 150)	Girls (n = 150)	Statistics using Chi square
Obese and Over-weight	29	45	$\chi^2 = 4.5922$
Normal weight	121	105	p = 0.0321* significant

Table 2 – Age wise distribution of weight in the Subjects

Age groups	Under-nourished	Normal weight	Over-weight	Obese
11-12 years	24%	58%	13%	3%
12-13 years	13%	64%	13%	7%
13-14 years	22%	51%	14%	11%
14-15 years	7%	69%	15%	7%
15-16 years	16%	52%	18%	14%
16-17 years	14%	56%	16%	14%
17-18 years	-----	100%	-----	-----

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