

ORIGINAL RESEARCH

Prevalence of overweight and obesity in school going children: A community based cross sectional study from Latur, Maharashtra

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ABSTRACT

Background: obesity has become a colossal epidemic causing serious public health concern and contributes to 2.6 million deaths worldwide every year. Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. The last two decades of previous century have witnessed dramatic increase in health care cost due to obesity and related issues among children and adolescents. **Objectives:** To study the prevalence of overweight and obesity in school children of age 12-16 years and its distribution according to age and gender. **Methods:** The present school based cross section observational study was carried out in Govt & Private schools of Latur district during the period from July 2021 to December 2021 involving 500 high school children of age 12-16 years. The data was analysed using SPSS. **Result:** Out of 250 boys, majority were from 15-15.9 years age i.e. 29.6%. Out of 250 girls, majority were from 14-14.9 years age i.e. 42%. Majority of the children had normal BMI i.e. 401(80.2%). Prevalence of overweight was 9.8%. Prevalence of obesity was 5%. It means there is significant difference in the proportion of overweight and obese boys and girls. Overweight and obesity was more in boys compared to girls. **Conclusion:** Prevalence of overweight was 9.8% and prevalence of obesity was 5%. Overweight and obesity was more in boys compared to girls. We also observed no specific age-related predilection for overweight and obesity in our study.

Key words: Prevalence, overweight, obesity, school children.

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INTRODUCTION

Worldwide, disease profile is transforming at a rapid pace catching the attention of medical professionals and policy makers alike. 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 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.¹ Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. The last two decades of previous century have witnessed dramatic increase in health care cost due to obesity and related issues among children and adolescents.²

For children and adolescents, overweight and obesity are defined using age and sex specific cut-offs for body mass index (BMI). Children with BMI equal to or exceeding the age-gender-specific 95th percentile are defined obese. Those with BMI equal to or exceeding the 85th but are below 95th percentile are defined overweight and are at risk for obesity related co-morbidities.³ Overweight and obesity are by definition, abnormal or excessive fat accumulation that may impair health⁴ or simply as a state of excess adipose tissue.⁵ Another definition says that obesity is an excessive accumulation of adipose tissue containing stored fat in the form of triglycerides.⁶

Objectives: To study the prevalence of overweight and obesity in school children of age 12-16 years and its distribution according to age and gender

MATERIALS AND METHODS

Study Design: School based cross section observational study. The study was carried out in Govt & Private schools of Latur district

Study Period: July 2021 to December 2021

Study Population: High school children of age 12-16 years

Inclusion Criteria

- Parents of students who agreed to be a part of the study.
- Students without any significant past history or those who are not suffering from any chronic illness from past 3 months will be included in the study.
- Both the sexes of between 12-16 years of age.

Exclusion Criteria

- Children who are suffering from chronic illness.
- Children having endocrine problems, physical and mental defects.
- Children who do not agree to be part of the study.
- Children who are malnourished.
- Sample size: 500

Methodology For Collection of Data

This study was conducted in school children in Latur district. After obtaining consent from the school authorities and parents of the participants and explaining to them the objectives as well as the method of this proposed study, a predesigned, pretested questionnaire is used to interview the participants to elicit information on their family characteristics like economic status, education and occupation of their parents. Information on individual characteristics like age, gender, time spent for watching TV and outdoor games, etc. is collected. For measuring height, drop down tape measure is used whereas for measuring weight, the modern-day weight scale is used.

Statistical Analysis and Methods

Data was collected by using a structure proforma. Data thus was entered in MS excel sheet and analysed by using SPSS 23.0 version IBM USA. Qualitative data was expressed in terms of percentages and proportions. Quantitative data was expressed in terms of Mean and Standard deviation. Association between two qualitative variables was seen by using Chi square/ Fischer’s exact test. A p value of <0.05 was considered as statistically significant whereas a p value <0.001 was considered as highly significant.

RESULT

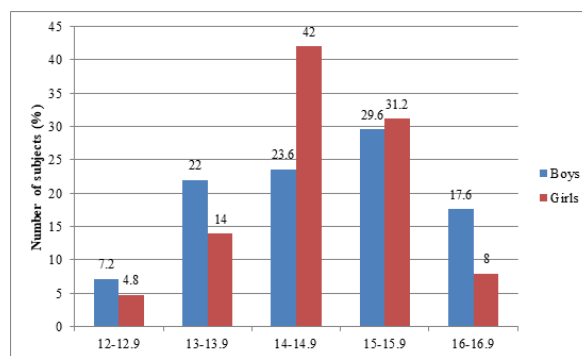


Figure 1: Bar diagram showing distribution according to age and gender

Out of 250 boys, majority were from 15-15.9 years age i.e. 29.6% followed by 23.6% from 14-14.9 years, 22% from 13-13.9, 17.6% from 16-16.9 and 7.2% from 12-12.9 years age group. Out of 250 girls, majority were from 14-14.9 years age i.e. 42% followed by 31.2% from 15-15.9 years, 14% from 13-13.9, 14% from 13-1.9, 8% from 16-16.9 and 4.8% from 12-12.9 years age group.

Table 1: Distribution according to BMI grades

		Frequency	Percent
BMI grades	Underweight	25	5.0
	Normal	401	80.2
	Overweight	49	9.8
	Obese	25	5.0
	Total	500	100.0

Majority of the children had normal BMI i.e. 401(80.2%). Prevalence of overweight was 9.8%. Prevalence of obesity was 5%.

Table 2: Distribution according to age and BMI

Age group in years	Underweight		Normal		Overweight		Obese		Total
	No	%	No	%	No	%	No	%	
12-12.9	2	8.0	26	6.5	2	4.1	0	0.0	30
13-13.9	7	28.0	70	17.5	10	20.4	1	4.0	88
14-14.9	6	24.0	134	33.4	17	34.7	9	36.0	166
15-15.9	7	28.0	113	28.2	18	36.7	14	56.0	152
16-16.9	3	12.0	58	14.5	2	4.1	1	4.0	64

Total	25	100.0	401	100.0	49	100.0	25	100.0	500
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Fischer's exact test-19.28, p-0.08 (>0.05), Inference-Not significant

Out of 49 overweight children, 18 (36.7%) were from 15-15.9 years age group followed by 17 (34.7%) from 14-14.9 years age group. Out of 25 obese children, 14 (56%) were from 15-15.9 years age group followed by 9(36%) from 14-14.9 years age group. Out of 401 normal children, 134 (33.4%) were from 14-14.9 years age group followed by 113(28.2%) from 15-15.9 years age group. The difference in the proportion was found to be not significant ($p>0.05$).

Table 3: Distribution according to gender and BMI

Sex	Underweight		Normal		Overweight		Obese		Total
	No.	%	No.	%	No.	%	No.	%	
Boys	15	60	191	47.6	27	55.1	17	68	250
Girls	10	40	210	52.4	22	44.9	8	32	250
Total	25	100	401	100	49	100	25	100	500

Chi square-27.7, p-0.0001 (<0.001), Inference- Highly significant

Out of 49 overweight children, 27 (55.1%) were boys and 22 (44.9%) were girls. Out of 25 obese children, 17(68%) were boys and 8(32%) were girls. Out of 401 normal children, 191(47.6%) were boys and 210(52.4%) were girls. The difference in the proportion was found to be significant ($p<0.05$). It means there is significant difference in the proportion of overweight and obese boys and girls. Overweight and obesity was more in boys compared to girls.

DISCUSSION

In our study, we included total 500 school going children of both Government and private school. The study participants were age group of 12 to 17 years age. Out of 500 school children involved in our study, majority 166 (33.2%) were from 14-14.9 years age group followed by 152 (30.4%) from 15-15.9 years age group. This is followed by 17.6% from 13-13.9, 12.8% from 16-16.9 years age group. Least were from 12-12.9 years age group i.e. 6%. Mean age was found to be 14.07 ± 1.02 years.

Prevalence of obesity:

Prevalence of overweight in our study was 9.8% whereas prevalence of obesity was 5%.

Sonya J⁷ from Chennai reported that total prevalence of overweight in children was 25.2% and prevalence of obesity was 12.4%. This study shows a higher prevalence rate of overweight/ obesity among girls, as did a previous study done in Chennai

Most of the earlier studies done in children and adolescents in India have reported prevalence based on international cut-off points ⁸⁻¹⁴ with a meta-analysis estimating the prevalence of overweight as 12.6% and obesity as 3.4%.¹⁵ Another multicentric study reported an overall prevalence of overweight/obesity as 18.2%.¹⁶

Preetam et al¹⁷ prevalence of obesity varied between 2 to 8 per cent. Overweight rates were around two times higher and seem to be more in northern and eastern India than in southern India.

One study from Srinagar reported a high prevalence rate of 25 per cent, probably due to the smaller numbers studied and being from affluent families.¹⁸

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 obese.

Harish Ranjani and colleagues¹⁹ in their meta-analysis reported region wise prevalence of obesity. A large variation was noted for combined prevalence (overweight + obesity) values reported from different studies ranging from 4.3 to 40.9 per cent. If further stratified by the cut-offs used, looking at studies using IOTF cut-offs, the combined prevalence range was 6.98 to 40.9 per cent. Region-wise stratification was done on the basis of the region where the studies were performed, excluding studies that were done across multiple regions. The median value for the combined prevalence based on the number of studies reported from that particular region showed that the combined prevalence was higher in north (20.7%, $n = 15$) compared to south (15.1%, $n=16$). The combined obesity prevalence from east India (22.0%, $n=4$) and west (19.7%, $n =8$) could not be used to make a significant conclusion due to the smaller number of studies reported from these areas.

Our findings are consistent with the findings of above-mentioned authors.

Age and obesity:

In our study, out of 49 overweight children, 18 (36.7%) were from 15-15.9 years age group followed by 17 (34.7%) from 14-14.9 years age group. Out of 25 obese children, 14 (56%) were from 15-15.9 years age group followed by 9 (36%) from 14-14.9 years age group. The difference in the proportion was found to be not significant ($p>0.05$). So, 14 to 16 is the commonly observed age group for overweight and obesity in our study.

Jackob JK et al²⁰ conducted a school-based cross-sectional study in a rural and urban school of Kochi city. Of the 254 girls of the rural school, 6 were Obese (8.74%) and 25 were overweight (42.66%). Of these,

obesity and overweight were more common among 12-year-old girls, 6.06% and 12.12%, respectively. Of the 220 girls of urban schools, 6 were obese (11.08%) and 21 were overweight (49.9%). Of these, obesity and overweight were more common in the 13 years old age group of 3 (5.56%) and 8 (14.81%), respectively. Of the 191 boys of the rural school, only 1 (1.27%) was obese and 12 (29.13%) were overweight. Of these, obesity and overweight were more in the 14-year age group of 1 (1.27%) and 4 (5.06%), respectively. Of the 272 boys of the urban school, 15 (21.91%) were obese and 38 (55.74%) were overweight. Of these, obesity was more among the 14-year-old children.

Ramesh K Goyal et al²¹ carried out study in 5664 school children of 12–18 years of age. They reported that the prevalence of overweight was 14.3 % (95% confidence interval (CI) 6.6– 24.5%) among boys and 9.3 % (CI 3.6–22.5%) among girls. Prevalence of obesity was 2.9 % (CI 0.0–4.0%) in boys and 1.5% (CI 0.0–5.0%) in girls. There was also a higher prevalence of overweight and obesity in boys compared with girls, but difference was not significant.

Our findings are consistent with the findings of above-mentioned authors.

Obesity and gender:

In our study, out of 49 overweight children, 27 (55.1%) were boys and 22 (44.9%) were girls. Out of 25 obese children, 17(68%) were boys and 8(32%) were girls. Out of 401 normal children, 191(47.6%) were boys and 210(52.4%) were girls. The difference in the proportion was found to be significant ($p < 0.05$). It means there is significant difference in the proportion of overweight and obese boys and girls.

Sonya J.⁷ from Chennai reported that prevalence of overweight in boys was 25.2% and of obesity was 12.4%. Also, prevalence of overweight in girls was 28% and of obesity was 12.5%. The prevalence of obesity was higher in girls than boys.

Khadilkaret al¹¹ reported on affluent Indian 2- to 17-year-old children and showed that the prevalence of overweight and obesity was 18.2 per cent by the IOTF classification while it was 23.9 per cent using WHO cut-points and the prevalence was higher in boys.

Chhatwale^{al²²} reported overall prevalence of childhood obesity and overweight in Punjab as 11.1 and 14.2 per cent, respectively and again a higher prevalence in boys (12.4 vs 9.9%, 15.7 vs 12.9%).

Sidhu and colleagues²³ from Amritsar reported overweight in 10 per cent among boys and 12 per cent among girls and obesity in 5 per cent boys and 6 per cent in girls. **Kotian and co-workers²⁴** reported that the overall prevalence of overweight and obesity were 9.3 and 5.2 per cent, respectively among boys and 10.5 and 4.3 per cent among girls, in a semi urban city in Karnataka.

The prevalence of obesity among boys was found to be higher than that of girls. However, girls were found to be more overweight than boys.

CONCLUSION

Prevalence of overweight was 9.8% and prevalence of obesity was 5%. Overweight and obesity was more in boys compared to girls. We also observed no specific age-related predilection for overweight and obesity in our study

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