

Original article

## Assessment Of BMI In School Going Children And Its Association With Some Sociodemographic Factors

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### Abstract

**Introduction:** According to WHO global estimates from 2008, more than 1.4 billion adults ( $\geq 20$  years) were overweight. Overall, more than one in ten of the world's adult population was obese. In 2010, more than 40 million children under five were overweight.

**Objectives:** To assess the BMI in school going children and its association with some sociodemographic factors

**Methodology:** 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.

**Results:** 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%. Educational status of the parents was assessed and we observed that there is no association between childhood obesity and fathers' education in our study. There is significant association between childhood obesity and overweight with mothers' education in our study. It is associated with literacy of mother.

**Conclusion:** Prevalence of overweight in our study was 9.8% whereas prevalence of obesity was 5%. We observed significant association between childhood obesity and overweight with mothers' education.

**Keywords:** school children, BMI, obesity etc

## Introduction

Overweight and obesity are the fifth leading risk for global deaths. At least 2.8 million adults die each year because of being overweight or obese. In addition, 44% of the diabetes burden, 23% of the ischaemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity.<sup>1</sup> According to WHO global estimates from 2008, more than 1.4 billion adults ( $\geq 20$  years) were overweight. Overall, more than one in ten of the world's adult population was obese. In 2010, more than 40 million children under five were overweight.<sup>2,3</sup>

Indian data regarding current trends in childhood obesity are emerging. Available studies of Delhi and Chennai has shown the prevalence of 7.4% and 6.2% respectively.<sup>4,5</sup>

Lifestyle changes and worldwide nutrition transition are important factors for obesity epidemic. Economic growth, modernization, urbanization (increased use of automated transport, technology at home) and globalization of food markets are important factors for increased prevalence of obesity. Food intake has been associated with obesity not only in terms of volume of food ingested but also in terms of composition and quality of diet.<sup>6</sup> Current eating habits include low consumption of fruits, green vegetables and milk, increased consumption of junk food, sweets and soft drinks etc. These eating habits with decreased physical activity will lead to childhood obesity. Eighty percent of overweight 10-14-year-old adolescents are at risk of becoming overweight adults compared to 25% of overweight preschool children ( $< 5$  years old) and 50% of 6-9-year-old overweight children.<sup>6,7</sup> Obesity in childhood and adolescence has been related to an increase in mortality in adulthood on follow up.

## Objectives:

1. To find out the association of some sociodemographic factors with overweight and obesity in school children

## 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

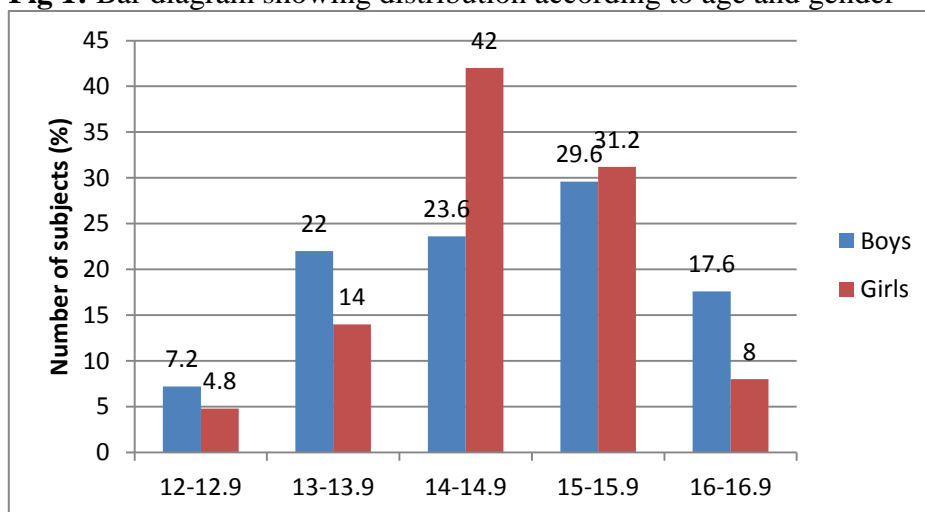
This study was conducted in school children in Latur district. After obtaining consent from the school authorities and parents of the participants and explaining to them the objectives as well as the method of this proposed study, a predesigned, pretested questionnaire is used to interview the participants 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.

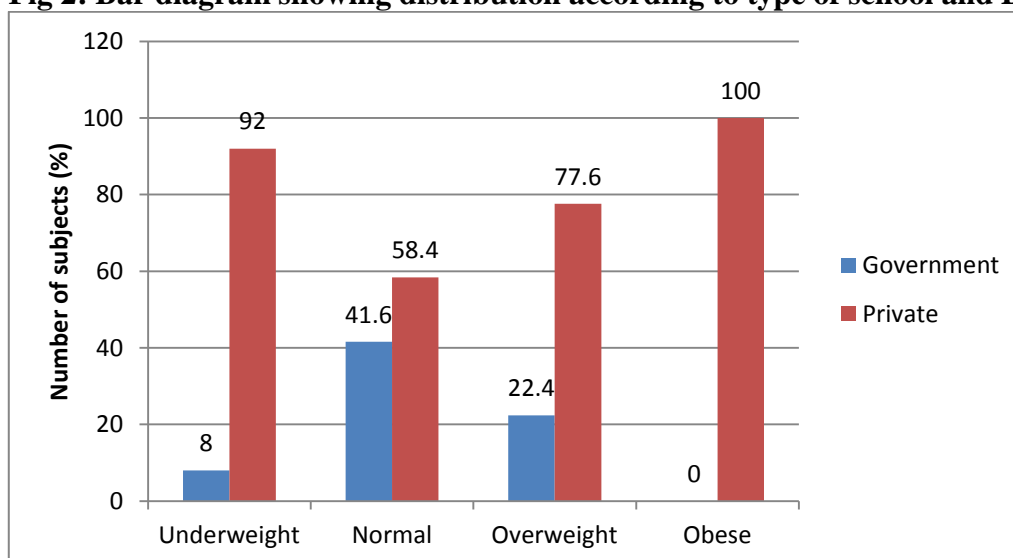
## Results

**Fig 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.

**Fig 2: Bar diagram showing distribution according to type of school and BMI**



**Chi square-32.02, p-0.0001 (<0.001), Inference- Highly significant**

**Table 1:**

Grade	Underweight		Normal		Overweight		Obese		Total
	No.	%	No.	%	No.	%	No.	%	
8th	10	40	81	20.2	11	22.4	4	16	106
9th	8	32	165	41.1	19	38.8	7	28	199
10th	7	28	155	38.7	19	38.8	14	56	195
Total	25	100	401	100	49	100	25	100	500

**Distribution according to BMI and education**

**Chi square-8.8, p-0.18 (>0.05), Inference- Not significant**

Out of 49 overweight children, 38.8% each were from 9<sup>th</sup> and 10<sup>th</sup> standard. Whereas out of 25 obese children, 14 i.e. 56% obese were from 10<sup>th</sup> standard. Out of 401 normal children, 41.4% were from 8<sup>th</sup> and 38.7% from 10<sup>th</sup> standard. The difference in the proportion was found to be not significant (p>0.05). It means there is almost similar strength of children in overweight and obese children compared with normal BMI children in our study.

**Table 2: Distribution according to BMI and fathers' education**

Education of father	Underweight		Normal		Overweight		Obese		Total
	No.	%	No.	%	No.	%	No.	%	
Illiterate	14	56	179	44.6	17	34.7	10	40	220
Primary	8	32	152	37.9	24	49	13	52	197
Secondary and Higher sec	2	8	61	15.2	5	10.2	2	8	70
Graduation and above	1	4	9	2.2	3	6.1	0	0	13
Total	25	100	401	100	49	100	25	100	500

**Chi square-10.2, p-0.33 (>0.05), Inference- Not significant**

Out of 401 overweight children, 44.6% children's father were illiterate. Out of 49 overweight children, 34.7% children's father were illiterate. Out of 25 obese children, 40% children's father were illiterate. The difference in the proportion was found to be not significant (p>0.05). It means there is no association between BMI and fathers' education in our study.

**Table 3: Distribution according to BMI and mothers' education**

Education of mother	Underweight		Normal		Overweight		Obese		Total
	No.	%	No.	%	No.	%	No.	%	
Illiterate	16	64	145	36.2	9	18.4	9	36	179
Primary	5	20	162	40.4	29	59.2	14	56	210
Secondary and Higher sec	3	12	75	18.7	3	6.1	2	8	83
Graduation and above	1	4	19	4.7	8	16.3	0	0	28
Total	25	100	401	100	49	100	25	100	500

**Fischer's exact test-35.3, p-0.0001 (<0.001), Inference- Highly significant**

In our study, proportion of mothers educated up to primary level in overweight group were more i.e. 59.2%. Similarly, proportion of mothers educated up to primary level in obese group were more i.e. 56%. Proportion of educated mothers in normal group was 40.4%. The illiteracy percentage in normal and overweight+ obese group is almost similar i.e.36.2% vs 27.2% but formal literacy rate in normal children was less compared to overweight+ obese 40% vs 57.6%. There is association between BMI and mothers education in our study. It is associated with literacy of mother.

### 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%.

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

Educational status of the parents was assessed and we observed that there is no association between childhood obesity and fathers' education in our study. There is significant association between childhood obesity and overweight with mothers' education in our study. It is associated with literacy of mother.

### Conclusion:

Prevalence of overweight in our study was 9.8% whereas prevalence of obesity was 5%. We observed significant association between childhood obesity and overweight with mothers' education.

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