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### **Prevalence of Obesity among Adolescents in Belagavi – A Pilot Project**

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#### **ABSTRACT**

**Background:** Non communicable diseases are the leading global causes of death, and strike hardest at the worlds low and middle income population. Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health

**Objectives:** to measure the prevalence of obesity among adolescent students (aged 10-16 years) in Belagavi.

**Methods:** In a descriptive cross-sectional study, 90 adolescent students aged 10 to 16 years were examined from private high school selected by Stratified Cluster Sampling technique Height and weight were measured in all participants and the body mass index (BMI) of each individual was calculated. Body mass index classes were calculated according to the International Obesity Task Force standards.

**Results:** Out of the 95 adolescent students, 69(72.63%) were boys and 26 (27.37%) were girls. The prevalence of overweight, and obesity was 9.47%, and 4.42%, respectively.

**Conclusion:** An increasing prevalence of overweight/obesity was seen in urban adolescents. Hence, it is an urgent need for immediate and targeted preventive measures.

**KEYWORDS:** Adolescents, overweight/obesity, prevalence

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## INTRODUCTION

Non communicable diseases are the leading global causes of death, and strike hardest at the worlds low and middle income population. They can be significantly reduced and millions of lives can be saved through the reduction of their risk factors, early detection of complications and timely treatment.<sup>1</sup>

Out of 57 million global deaths in 2008, 36 million (63%) were due to NCDs principally cardiovascular diseases, DM, cancers and chronic respiratory diseases.<sup>2</sup>

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health.<sup>5</sup>

Obesity is one of the most widespread and major problems affecting children and adolescents and is a global nutritional concern. An increased prevalence is found in many countries where the major nutritional disorder previously was malnutrition.<sup>18</sup> An increase in the prevalence of childhood obesity is associated with potential medical and psychosocial complications of obesity in adolescence<sup>19, 20</sup>

### *Recent WHO global estimates showed that*

- In 2014, more than 1.9 billion adults aged 18 years and older were overweight and obese, 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight and obese,
- The worldwide prevalence of obesity more than doubled between 1980 and 2014.<sup>23</sup>
- In India prevalence of overweight and obesity among adolescents aged between 10-19 years was found to be 11% and 5.75 respectively and is varies within country.<sup>24</sup>

If current trends continue the number of overweight or obese young children and adolescents globally will increase to 70million by 2025.<sup>24</sup>

## MATERIALS AND METHODS

The study was conducted in a private high school of Belagavi city. Ninty five students, aged 10-16 years were selected through stratified sampling technique.

A prior consent for the study was taken from DDPI, Belagavi, school administration and from the parents. At the time of initiating the study each participants were informed about the study protocol and written assent was obtained.

Weight and height were taken using a standard procedure Body weight was measured to the nearest 100 grams using calibrated portable scales. Height was measured to the nearest centimeter with the subject in full standing position, using a calibrated measuring rod. All measurements were taken with minimal clothing and without shoes.

**Inclusion criteria**

1. Adolescent students aged 10- 16 years from 5<sup>th</sup> to 10<sup>th</sup> standard studying in selected government and private schools of Belagavi city.
2. Students who are willing to participate in the study.

**Exclusion criteria**

1. Schools having exclusively boys or girls(Non-coeducational schools)
2. Children having chronic illnesses such as severe malnutrition, endocrinal problems and physically handicapped.

**RESULTS**

A Cross sectional study consisting of 95 Adolescents is undertaken to study the prevalence of obesity. The maximum number of adolescents in the present study belonged to the 14 years age group (33.68%). Males constituted 72.63% of the subjects studied and females constituted 27.37% of the study group. Majority of family income 37 (38.95%) were <=10000. There was family history of hypertension in 4.21%, Diabetes mellitus in 8.42%, and obesity in 15.79% of the total adolescents studied. The prevalence of obesity in adolescents was found to be 8.42% and there was no significant association with demographic variables

**Section I-Socio-demographic data**

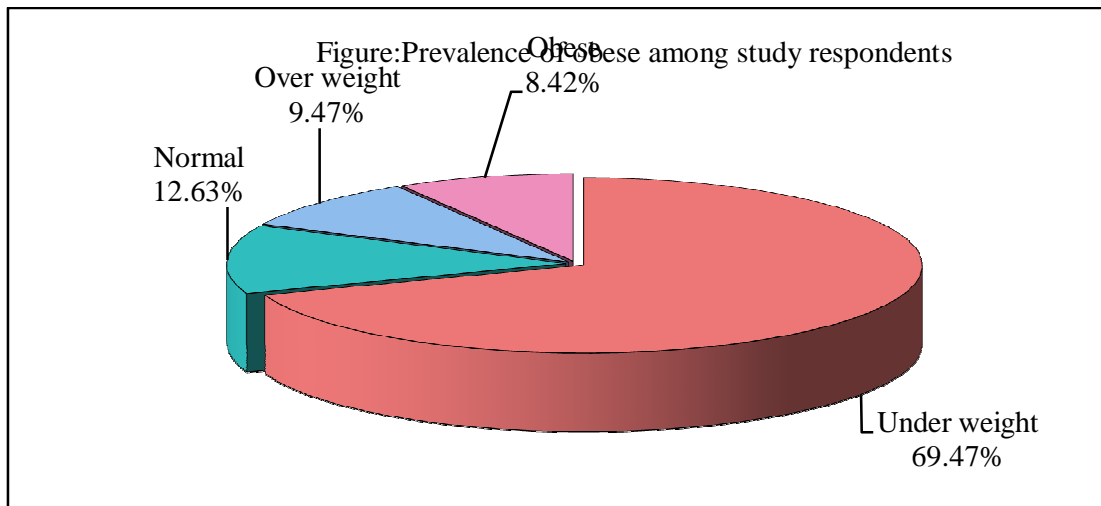
**Table 1: Socio-demographic characteristics wise distribution of study respondents**

Characteristics	No of respondents	% of respondents
<b>Age in yrs</b>		
13	18	18.95
14	32	33.68
15	26	27.37
16	19	20.00
<b>Gender</b>		
Boys	69	72.63
Girls	26	27.37
<b>Class of study</b>		
7	21	22.11
8	27	28.42
9	33	34.74
10	14	14.74
<b>Father education</b>		
Primary	23	24.21
Secondary	39	41.05
Graduate	33	34.74
<b>Mother education</b>		
Illiterate	5	5.26
Primary	36	37.89
Secondary	37	38.95
Graduate	17	17.89
<b>Family income</b>		
<=10000	37	38.95

10001-15000	26	27.37
15001-20000	17	17.89
>=20001	15	15.79
<b>Types of family</b>		
Nuclear	65	68.42
Joint	30	31.58
<b>Family History</b>		
No	83	87.37
Diabetic	8	8.42
Hypertension	4	4.21
<b>Obese person in your family</b>		
No	80	84.21
Yes	15	15.79
<b>Total</b>	<b>95</b>	<b>100.00</b>

**Table 2: Prevalence of obese among study respondents**

Category	No of respondents	Prevalence
Under weight	66	69.47
Normal	12	12.63
Over weight	9	9.47
Obese	8	8.42
<b>Total</b>	<b>95</b>	<b>100.00</b>



**Pie graph showed the prevalence of obesity among adolescents**

**Table 3: Association between Socio-demographic characteristics with prevalence of obesity**

Characteristics	UW	%	Normal	%	OW	%	Obese	%	Total	Chi-square	p-value
<b>Age in yrs</b>											
13	13	72.22	0	0.00	2	11.11	3	16.67	18	9.7220	0.3730
14	22	68.75	5	15.63	2	6.25	3	9.38	32		
15	20	76.92	4	15.38	1	3.85	1	3.85	26		
16	11	57.89	3	15.79	4	21.05	1	5.26	19		
<b>Gender</b>											
Boys	47	68.12	8	11.59	7	10.14	7	10.14	69	1.2910	0.7310
Girls	19	73.08	4	15.38	2	7.69	1	3.85	26		
<b>Class of study</b>											
7	17	80.95	2	9.52	0	0.00	2	9.52	21	12.6800	0.1780
8	19	70.37	1	3.70	5	18.52	2	7.41	27		
9	23	69.70	6	18.18	1	3.03	3	9.09	33		
10	7	50.00	3	21.43	3	21.43	1	7.14	14		
<b>Father education</b>											
2	15	65.22	3	13.04	2	8.70	3	13.04	23	3.6430	0.7250
3	30	76.92	5	12.82	3	7.69	1	2.56	39		
4	21	63.64	4	12.12	4	12.12	4	12.12	33		
<b>Mother education</b>											
1	1	20.00	2	40.00	0	0.00	2	40.00	5	16.5550	0.0500*
2	26	72.22	3	8.33	5	13.89	2	5.56	36		
3	29	78.38	3	8.11	2	5.41	3	8.11	37		
4	10	58.82	4	23.53	2	11.76	1	5.88	17		
<b>Family income</b>											
<=10000	28	75.68	3	8.11	2	5.41	4	10.81	37	5.4500	0.7930
10001-15000	19	73.08	4	15.38	2	7.69	1	3.85	26		
15001-20000	10	58.82	3	17.65	3	17.65	1	5.88	17		
>=20001	9	60.00	2	13.33	2	13.33	2	13.33	15		
<b>Types of family</b>											
Nuclear	43	66.15	8	12.31	6	9.23	8	12.31	65	4.0490	0.2560
Joint	23	76.67	4	13.33	3	10.00	0	0.00	30		
<b>Family History</b>											
No	55	66.27	12	14.46	9	10.84	7	8.43	83	4.5650	0.6010
Diabetic	7	87.50	0	0.00	0	0.00	1	12.50	8		
Hypertension	4	100.00	0	0.00	0	0.00	0	0.00	4		
<b>Obese person in your family</b>											
No	57	71.25	11	13.75	8	10.00	4	5.00	80	7.9220	0.0480*
Yes	9	60.00	1	6.67	1	6.67	4	26.67	15		

Total	66	69.47	12	12.63	9	9.47	8	8.42	95		
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## DISCUSSION

The overall prevalence of overweight and obesity was found to be 8.42% among adolescents (aged 10-16 years) from the present study. Goyal *et al.*<sup>9</sup> reported a similar prevalence (12%) of overweight and obesity among adolescents (aged 12-18 years). It was also reported in the same study that the prevalence of overweight was high among adolescent children who belonged to higher socioeconomic class compared to those who belonged to the lower socioeconomic class. Laxmaiah *et al.*, in a similar study conducted among adolescents in the age group of 12-17 years, reported prevalence as low as 7% during the year 2007.<sup>10</sup> It was observed by George *et al.*<sup>11</sup> in a study done in Kerala among rural adolescent children in the age group of 13-18 years that the rates of prevalence of overweight and obesity were 16% and 7%, respectively. The results of the studies discussed above show a higher prevalence when compared to our study. A higher prevalence of about 15.8% was also reported from another study by Ramachandran *et al.*<sup>12</sup> among urban adolescent school children.

## CONCLUSION

The prevalence rate of obesity was 8.42%., in our study population. The study results show that overweight and obesity is predominant among adolescent students belonging to the private school in Belagavi city.

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