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PREVALENCE AND SOCIODEMOGRAPHIC PROFILE OF OVERWEIGHT AND OBESITY AMONG SCHOOL GOING ADOLESCENTS IN UDAIPUR CITY – A CROSS SECTIONAL STUDY!

Medical Science

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ABSTRACT

Background: Obesity is emerging as a "global epidemic". Adolescents are at special risk due to the westernization of lifestyle.
Objective: The study was done to assess the Prevalence and the Socio-demographic profile of Overweight and Obesity among school going adolescents aged 10 to 16 years in Udaipur city of Rajasthan.
Method: A study sample of 900 students was taken from10 randomly selected government and private schools of the city at C.I. of 95% and were subjected to questionnaire & measurements.
Results: The prevalence of obesity in school-going adolescents was found to be 4.4% and the total prevalence of "overweight and obesity" was 13.1%. The prevalence was statistically significant higher in 13 to 15 year age groups, higher in girls than boys, more in private school compared to government school going children. The prevalence was also higher in subjects belonging to higher socio-economic classes (Class 1 and 2) and the ones whose mother (13.8%) and father (14.9%) had education up to an undergraduate degree.
Conclusion: The epidemic of obesity has deepened its roots in the adolescent population as its prevalence has increased more than 10 % in this age group. Immediate actions are required to control the public health issue to protect our potential future workforce from this menace.

KEYWORDS

Obesity, Overweight, School going Adolescents

INTRODUCTION

The WHO defines obesity as a 'global epidemic'.[1] The proportion of children in the general population who are overweight and obese has doubled over the past two decades in developed and developing countries including India.[2] Childhood obesity increases the risk of adult obesity and chronic health problems such as type II diabetes, hypertension and CVDs.[3]

The transition in nutrition and lifestyle by the popularity of fastfoods, soft drinks, sedentary lifestyles, lack of exercise, increased television and computer usage are the common trends offered which are the causes of overweight and obesity.[4]

Health care professionals define obesity or increased adiposity using the body mass index(BMI) or Quetelet's Index[5], a proxy for more direct measurement of body fat. BMI=weight in kg/(height in meters).[6]

In children, obesity and overweight are defined using BMI percentiles; children >2 yr old with a BMI ≥ 95th percentile for that age and sex is the criterion for obesity, and those with a BMI between the 85thand 95thpercentiles for that age and sex, fall in the overweight range.[7]

Studies from metropolitan cities in India have reported a high prevalence of obesity among affluent school children.[8] On the other hand, some studies reported a high prevalence of under nutrition among rural school children and children in urban slums.[9]

Keeping this in mind, this study was planned in order to assess the Prevalence and the Socio-demographic profile of Overweight and Obesity among school going adolescents aged 10 to 16 years in Udaipur city of Rajasthan.

Methodology

A school based cross-sectional study was conducted for duration of 4 months from July to October 2015 in Udaipur city of Rajasthan. A school-to-school survey was conducted in 10 randomly selected government and private schools of the city which included School going adolescents of 10-16 year age group. Informed consent from the student & parents were taken by the school authorities. A minimum sample size of 900 at C.I. of 95% was calculated using EPI*info 6* to assess the magnitude of prevalence of adolescent overweight and obesity in Udaipur by population survey method taking the prevalence of overweight as 12% from previous studies. A self-made, semi-structured, pretested questionnaire was used for collection of qualitative data and **WHO BMI for age** table standard tool for collection of data in this study according to which "Subjects with more than 85 percentile are called overweight and subject with more than 95 percentile are termed as obese". Data entered in MS Excel and analyzed by using EPI*Info* 6 and SPSS 16. Chi-square test was applied as a test of significance. A p value <0.05 was considered statistically significant.

RESULTS

In our study, majority of students (21.5%) were from age-groups 15-16 years followed by 12-13 year age-group(19.7%) and lowest proportion (9.4%) in 10-11 year age-group. A higher proportion of male adolescents(54%) as compared to female children (46%) were studied. 540(60%) of 900 study subjects were coming from private schools and 360 (40%) study subject from government schools. Majority(71.4%) of students included in the study belonged to nuclear family and rest belonged to joint family. Majority of the study subjects belonged to Class 2 SES. Mean height, weight and BMI showed the increasing trend, highest being in 15-16 yrs and least in 10-11 yrs age group.

Table I: Prevalence of overweight and obesity in study population according to age group

Age group	BMI Category			Total	% of Overweight +Obese	% of Obesity
	< 85th percentile	85th- < 95th percentile	≥ 95th percentile			
10-11 years	76	6	3	85	10.5%	3.5%
11-12 years	107	9	5	121	11.5%	4.1%
12-13 years	162	10	6	178	8.9%	3.3%
13-14 years	127	17	8	152	16.5%	5.2%
14-15 years	144	16	10	170	15.2%	5.8%
15-16 years	166	18	10	194	14.9%	5.1%
Total	782	76	42	900	13.1%	4.6%

The prevalence of obesity (BMI > 95th percentile) in school going adolescents was found to be 4.4% and the total prevalence of "overweight and obesity" (BMI > 85th percentile) was 13.1%. Assessing amongst each age-group, we found that that maximum prevalence of overweight and obese children were in 13-14 and 14-15 year age-groups(16.5% and 15.2 % respectively). Lowest prevalence of overweight and obesity was seen in 12-13 year of age group.(Table-I)

Prevalence of "overweight and obesity" was more in girls(17.4%) than boys(9.4%). Obesity was almost double in girls than boys, 6.3% and 3.3%, respectively. There was statistically significant relationship between sex of study subject and prevalence of overweight and obesity.(Fig-I)

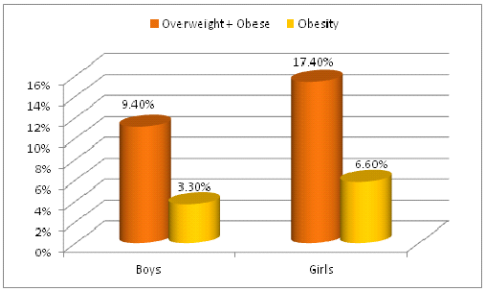

Fig I: Comparison of overweight+obesity and obesity between the two genders

The prevalence of "overweight and obesity" and "obesity" was seen more in private school as compared to government [(15.7% and 9.2%) and (5.6% and 3.3%)] respectively school-going children. There was statistically significant relationship between type of school and prevalence of overweight and obesity.(Fig-II)

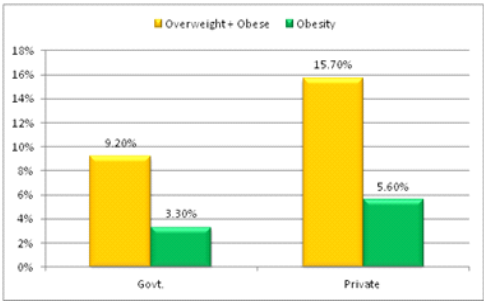

Fig II: Government and private school wise distribution of Overweight+obesity and obesity

The proportion of overweight and obesity was higher in study subjects who lived in nuclear families(14.4%) than the ones living in joint families(9.9%) but the difference was not statistically significant with $p>0.05$.

The prevalence of overweight and obesity was higher in subjects belonging to Class 2 (16.1%) and Class 1 (15.2%) respectively. Statistical significance was found in difference in prevalence of overweight & obesity and socioeconomic status with $p<0.05$.

The prevalence of overweight and obesity was higher in study subjects whose mother (13.8%) and father (14.9%) had education up to an undergraduate degree and the relationship was statistically significant;$p<0.01$.(Table-II)

Table II: Distribution of study subjects according to their parents' education status

Educational status of Father	Non-overweight/ Non-obese	Overweight/obesity
Illiterate	87 (9.6%)	6 (6.8%)
Primary	98 (10.8%)	8(8.1%)
Middle	104 (11.5%)	12(11.5%)
Secondary	123 (13.6%)	15(12.2%)
Higher secondary	234 (26.0%)	39(16.6%)
Graduate and above	254 (28.2%)	38(14.9%)
Total	900 (100%)	118(13.1%)
Education status of Mother		
Illiterate	105(11.6%)	10(9.5%)
Primary	171(19.0%)	18(10.5%)
Middle	134(14.8%)	17(12.68%)
Secondary	151(16.7%)	14(9.1%)
Higher secondary	229(25.4%)	30(13.1%
Graduate and above	210(23.3%)	29(13.8%)
Total	900(100%)	118(13.1%)

DISCUSSION

The present study was a school based cross-sectional study in which, the overall prevalence of overweight and obesity was 13.1% and the prevalence of overweight was 8.44% and the prevalence of obesity was 4.66%. This is comparable to study done by M Shashidhar et al[10] among 12-15 year adolescent in Mangalore in the year 2010 revealed that the prevalence of overweight and obesity was 9.9% and 4.8% respectively. Similarly a study conducted by T Aggarwal et al[11] among affluent adolescent school children in Ludhiana in the year 2008 revealed that the prevalence of overweight and obesity was 12.7% and 3.4% respectively. Again the study done by M Premanath et al[12](2008) conducted in maysore district of karnataka which reported the prevalence of overweight and obesity was 8.5% and 3.4% respectively. Also Sethi and Kapoor et al (2003)[13] also found that the total prevalence of overweight and obesity were 14.68% while obesity was 2.69%.

In the present study, the prevalence of overweight and obesity was found more among girls 15.4% as compared to boys which is 9.1%. A study conducted by Avula Laxmaiah et al. (2007)[14] found that the overall prevalence of overweight was higher in girls (8.2%) than boys (6.1%).

The highest prevalence 16.5% of overweight and obesity was found in the age of 13-14 years followed by 15.2% in the age group of 14-15 years. In a study done by Mohanty B[15] in Puducherry, the prevalence of overweight and obesity was found high in around 15 year of age and a positive correlation found in the age and obesity. This could be due to the fact that fat tissue and overall body weight increases in the children during puberty.

The prevalence of overweight and obesity is more in private school as compared to government (15.7% & 9.2%, respectively) school going children. In a study done by KG Deepak[16], children in privately funds had a significant increase in prevalence of both overweight (29.0%) and obesity (11.6%) while government funded school did not show a significant change in prevalence of overweight(11.2%) and obesity(4.9%).

In our study maximum prevalence 28.2% of overweight and obesity found in children whose father educated upto graduate and above. A study done by Bharti DR et al[17] has mentioned that parents educational status has an effect on childhood obesity. Contrary to our study in a study done by Chaput JP et al[18], revealed that low parental education status was significantly associated with childhood obesity.

This study has brought down many points to ponder over and dots to be connected in order to leads us to the ultimate story of evolution of overweight and obesity in the children and adolescents.

CONCLUSION

This 4 month long study led us to many conclusions like the epidemic of obesity has deepened its roots in the adolescent population as its prevalence has increased more than 10 % in this age group. The preponderance of obesity in girls in early age groups and private institutions could very well be related to lack of enough physical activity and decreasing age of menarche and hormonal activities. Higher education of parents and also higher socio-economic status have been found to have a significant relation with the obesity in adolescents which possibly is a consequence of affordability and affluence which leads to deranged dietary patterns.

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