Research Article

A study of prevalence of obesity and its correlates among government and private school children in Hyderabad: a comparative study

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ABSTRACT

Background: Obesity has reached epidemic proportions in India in the 21st Century, affecting 5% of the country's population. Childhood obesity is an emerging problem in urban Indian children and increase in childhood overweight and obesity may be a major contributor to adult obesity epidemic. Hence present study has been planned with the objective to study and compare the prevalence of obesity in government and private schools and also to study the risk factors associated with obesity.
Methods: An institution based cross sectional study was carried out among 718 school children of randomly selected government and private schools of Hyderabad city. Students were enquired about their physical activity and dietary habits as per the questionnaire. Anthropometry measurements like height and weight were recorded for each student. Data was analyzed using appropriate statistical tests.
Results: Prevalence of obesity was found to be 21.09% among private school children and 19% in government school children. Physical activity factors like conveyance to school and less frequency of outdoor games were significantly associated with obesity. Diet related determinants like intake of soft drinks, sweets, pizza, fruits were found to be associated with obesity.
Conclusions: It can be concluded that the prevalence of obesity in schools of Hyderabad is very high and it is positively associated with inappropriate exercise and improper dietary practices.

Keywords: Prevalence, Obesity, School children

INTRODUCTION

The health of children and youth is of fundamental importance. Over one-fifth of our population comprises of children aged 5-14 years that is, the group covering primary and secondary education. As today's children are the citizens of tomorrow's world, their survival, protection, and development are the prerequisite for the future development of humanity. Without ensuring optimal child growth and development, efforts to accelerate economic development significantly will be unsuccessful.[1]

Today as the standards of living continue to rise, weight gain and obesity are posing a great threat to health of the world. Obesity is a chronic disease, prevalent in both developed and developing countries. In many developing countries including India, it co exists with under nutrition. This constitutes a double burden for these countries. The problem of obesity is not only confined in adults but also among children and adolescents.[2]

Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. But in addition to increased future risks, obese children

experience breathing difficulties, increased risk of fractures, hypertension, and early markers of cardiovascular disease, insulin resistance and psychological effects.[3]

Obesity is strongly associated risk factor for many known diseases and is also linked to under achievement in school, to lower self-esteem and has negative consequences on cognitive and social development. The most significant long term consequence of childhood obesity is its persistence into adulthood along with its attendant risks.[2]

Obesity has reached epidemic proportions in India in the 21st Century, affecting 5% of the country's population. Childhood obesity is an emerging problem in urban Indian children and increase in childhood overweight and obesity may be a major contributor to adult obesity epidemic.[4]

With this background present study has been planned with the objective to study and compare the prevalence of obesity in public and private schools and also to study the risk factors associated with obesity.

METHODS

An Institution based cross sectional study was conducted from January 2015 to April 2015. Urban Health Centre, Shapur Nagar, Hyderabad (India) is the field practice area of Department of Community Medicine, Malla Reddy Institute of Medical Sciences, Hyderabad. The schools from this area were selected for the present study.

Initially Institutional Ethics Committee permission was obtained for the study.

There were a total of 18 private and 3 Government schools. Out of this, one private and one Government school was selected by random sampling technique. From each school, it was decided to study the students of classes 6th to 10th.

A prior permission from each selected school was sought from the Principal of the school before the start of the actual study after explaining the nature and schedule of the study.

As a first step, all the students from 6th to 10th classes of both the schools from all sections of each class were enumerated. There were 520 students in the private and 430 from the Government school.

The sample size was calculated based on the findings of a study conducted by Adinatesh KV et al 2 among school children of Karimnagar town which is close to Hyderabad. In this study the author reported a prevalence of overweight and obesity combined as 14.68%. But considering the metropolitan nature of Hyderabad city and year of study i.e. 2015, we assumed a higher

prevalence of 20% for overweight and obesity combined as a base to calculate the sample size. Taking 20% as possible prevalence with 95% confidence interval and an allowable error of 15%, the sample size came out to be 711 for both the schools together.

This was divided almost equally between the two schools. From each school, the roll call of each class and section was obtained. 353 students of Government and 365 from private school were selected randomly in such a way that each class and section was included and this number represented the schools.

Class teacher permission was obtained. A predesigned, pretested and structured questionnaire was used to collect information on individual characteristics like age, sex, parent's education, parent's occupation, religion, physical activity, family history of obesity etc. Height and weight were measured as per standard WHO guidelines.[5] Body Mass Index (BMI) was calculated as body weight in kg/height in meters square.[6] The cut off points for age and gender specific BMI were used in the present study as per Agarwal et al recommendations.[7]

Statistical analysis

Data was entered and analyzed in Epi info software.

RESULTS

The mean age of study subjects in Government school was 13.32±1.42 and in private school was 13.08 ±1.42 which is comparable. A total of 353 children were from Government school and 365 from private school. In both the schools, males were more than the females. Maximum children belonged to the age of 14 years (24.7%) followed by 13 years of age (21/9%). For Government school, maximum were in the age of 12 years (52.2%) and for private school, maximum were at 14 years (62%).

The overall prevalence of obesity in Government school was 19% and private school was 21% respectively. There was no statistically significant difference in the prevalence of obesity in Government and private schools (p < 0.05).

Table 3 shows association of various physical activity factors with obesity. Various physical activities studied were conveyance to school, watching television (TV), playing video games, and outdoor games. Out of these, conveyance to school by sedentary means like school bus or dropped by parents and less frequency of outdoor games were found to be significantly associated with obesity in the private school (p < 0.05). But for government school children, only less frequency of outdoor games was the only physical activity factor which was significantly associated with obesity (p < 0.05). Other factors were not found to be statistically significant.

Table 4 shows association of various diet related determinants with obesity. Various diet related determinants studied were type of diet, intake of soft drinks, sweets, pizza, fruits were studied. Out of these except type of diet all other factors were found to be significantly associated with obesity (p < 0.05) for private school children. In government school children, only intake of soft drinks and daily sweets were found to be statistically significant (p < 0.05).

Table 1: Age and gender wise distribution of study subjects.

Age(Years)	Government School			Private School		
	Male	Female	Total	Male	Female	Total
10	03 (75)	01 (25)	04 (1.1)	02 (33.3)	04 (66.7)	06 (1.6)
11	17 (46)	20 (54)	37 (9.3)	33 (57.9)	24 (42.1)	57 (15.6)
12	33 (52)	30 (48)	63 (17.8)	32 (47.8)	35 (52.2)	67 (18.4)
13	49 (54)	41 (46)	90 (25.5)	48 (60)	32 (40)	80 (21.9)
14	47 (57)	36 (43)	83 (23.5)	56 (62.3)	34 (37.7)	90 (24.7)
15	26 (52)	24 (48)	50 (14.2)	32 (55.2)	26 (44.8)	58 (15.9)
16	25 (96.2)	01 (3.8)	26 (8.6)	07 (100)	0	07 (1.9)
Total	200 (56.7)	153 (43.3)	353 (100)	210 (57.5)	155 (42.5)	365 (100)

*Figures in the parentheses indicate percentage

DISCUSSION

An institution based cross sectional study was carried out to study and compare the prevalence of obesity and its related factors among school children.

Prevalence of obesity was found to be 21.09% among private school children and 19% among school children of government school. Bharati DR et al found a very low prevalence of 4.3% compared to present study.[8] This is because they conducted the study in the rural area. Thakre SB et al in their study carried out in Nagpur city reported a prevalence of 14.52%.[9] Nagpur city has yet not acquired the metropolitan character like Hyderabad. Hence they found a less prevalence compared to present study. But it is definitely higher than Wardha study as Wardha study was conducted in a rural area. Tharkar S et al observed that the prevalence of overweight was 12.1% among children and 15.5% in adolescents.[10] Kaur J et al noted a prevalence of obesity of 26.84% in private school girls which is higher than that reported by us.[11] This may be because of difference in the climate of Hyderabad and Ludhiana (Punjab). Sain S et al found that out of 245 children studied, 16.73% were overweight and 6.54% were obese.[12] Cherian AT et al found that the prevalence of obesity was 3% for boys and 5.3% for girls in urban schools in Kerala.[13] Goyal RK et al reported the age adjusted prevalence of overweight as 14.3% among boys and 9.2% among girls, whereas the prevalence of obesity was 2.9% in boys and 1.5% in girls.[14]

These differences in prevalence of obesity across India are due to various factors like urban/rural settings of the study, climate, and variation in the eating habits of the people across India as well as the standards used to classify obesity.

We found that conveyance to school by sedentary way (like use of school bus, dropped by parents) and not playing or less frequency of outdoor games were significantly associated with obesity. Similar findings were reported by Bharati DR et al, Thakre SB et al, Sain S et al, Goyal RK et al.[8-10,14]

We also examined an association between diet related determinants like type of diet, intake of soft drinks, sweets, pizza, fruits with obesity. It was found that except type of diet all other factors were significantly associated with obesity among private school children. But for government school children only intake of excess sweets was associated with obesity. Thakre SB et al found that risk of obesity was more among those who consumed non vegetarian diet and who regularly consumed junk food.[9] Sain S et al observed that among overweight students, 87.72% consumed junk food more than 4 days per week.[12] Goyal RK et al also found that eating habits like junk food, chocolate, eating outside at weekend were significantly associated with obesity.[14]

Table 2: Prevalence of obesity in private and government schools.

Variable	Government school	Private school	Chi-square	p value
Non-obese	287 (81.3)	288 (79)	0.647517	0.4210
Obese	66 (19)	77 (21.09)		
Total	353	365		

Thus it can be noted that though the prevalence rates reported across India may vary but all agree to the fact that lack of exercise like watching television for long

hours, playing video games, reduced participation in outdoor games etc. and improper eating habits like junk food (in the form of soft drinks, cake, pizza, fast food) are important determinants of overweight and obesity among school children.

Table 3: Relationship of different activity related determinants with obesity (only obese children included).

Determinants	Private School N= 77	Chi-square & P value	P value	Government School N= 66	Chi-square	p value
Conveyance to school						
Walking	11(14.2)	24.71801564	0.0000	11(17)	24.71802	0.0409
Bus/auto/dropped by parents	46(60)			43(65.1)		
Bicycle	20(26)			12((18.1)		
Watching TV						
<30min/day	31(40.2)	0.61574325	0.73501	16(24.2)	10.32954	0.796748
>30min/day	41(53.2)			44(67)		
Don't watch	5(6.4)			6(9)		
Playing Video Games						
<2hrs/week	28(36.3)	1.78647633	0.4093	32(48.4)	2.318269699	0.028229
>2hrs/week	13(17)			9(14)		
Don't play	36(47)			25(38)		
Outdoor games						
Daily	23(30)	46.9039093	0.0000	21(32)	41.69871	0.0000
2-3 times/week	54(70.1)			45(68.1)		

Table 4: Relationship of obesity with different diet related determinants.

Determinants	Private school	Chi square	p value	Government school	Chi square	p value
Type of diet						
Vegetarian	21(27)	0.75	0.3877	14(21.2)	0.52	0.4710
Mixed	56(73)			52(79)		
Intake of soft drinks						
Daily	46(60)			31(47)	Daily	46(60)
2-3 times a week	24(31.1)	149.44	0.0000	27(41)	2-3 times a week	24(31.1)
Occasionally	2(3)			2(3)	Occasionally	2(3)
Don't' Drink	5(6.4)			6(9)	Don't' Drink	5(6.4)
Sweets						
Daily	49(64)			34(52)	Daily	49(64)
2-3 times a week	12(16)	145.48	0.0000	13(20)	2-3 times a week	12(16)
occasionally	00			8(12.1)	occasionally	00
Don't' eat	16(21)			11(17)	Don't' eat	16(21)
Pizza's/Burgers						
Daily	14(18.1)			2(3)	5.03	0.1696
2-3 times a week	00	61.04	0.0000	6(9)		
Occasionally	3(4)			15(23)		
Don't eat	60(78)			43(65.1)		
Fruit						
Daily	14(18.1)	97.63	0.0000	43(65.1)	3.07	0.3812
2-3 times a week	16(21)			18(27.2)		

School children at present are future of tomorrow. Hence there is a need for a policy for schools across India which will take of these important risk factors of obesity. This policy should take care that every school must have playing hours for children. The school teachers should also receive health education on proper dietary practices so that they can impart the same to their students.

CONCLUSION

It can be concluded that the prevalence of obesity in schools of Hyderabad is very high and it is positively associated with inappropriate exercise and improper dietary practices.

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