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Frequency of overweight and obesity among Middle School Children A case study of District Hyderabad Pakistan

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Abstract: The objective of this study was to determine the prevalence of obesity among middle school children of Hyderabad District. We undertook a comprehensive cross sectional study to assess the prevalence of obesity among middle school children. A total of 600 students from public and private schools were enrolled for the study (300 female students and 300 male students). Out of 300 female students, 150 students belongs to public and remaining150 to private schools. Likewise out of 300 male students, 150 students belong to public and 150 belong to private schools. Body Mass Index (BMI) was used to determine prevalence of overweight and obesity. BMI for age was computed by measuring height and weight of each student. The result shows that the mean age of female students was 12.40 years and means height was 57.94 inches. While their male counterparts had a mean age of 13.19 years and mean height was 60.50 inches. The prevalence of obesity among female students was 9.3% and 17.34% in public and private schools respectively and combined obesity was 13.3% similarly the prevalence of obesity among male students was 18.7%, 17.3% and 18.0% in public, private schools and combined total respectively. The high prevalence of obesity among schoolchildren seems to be due to the sedentary life style, lack of recommended physical activity on daily basis as well as consumption large amount of calories in the form of junk food or fast food. High-tech devices like mobile, cordless phones and remote controls also contribute to couch culture and prevent children of necessary walk. Furthermore, it was also observed that people are less aware of health, and psychological issues of child obesity.

Keywords: Prevalence, Obesity, Middle School, Hyderabad

1. INTRODUCTION

The prevalence of obesity in children and adolescence is mounting around the world (Bharnmal 2000). Obesity in children is a budding public health hazard which needs urgent consideration, the pace at which the prevalence of obesity among children is escalating has provoked public health professionals to address the situation as a grave risk to wellbeing of our people and emphasize the need to activate anticipatory measures, Obesity may be defined as a state of abnormal or unnecessary growth of fat in the adipose tissue to the level that health becomes effected. (Garrow, 1988). Fatnessmay also be explained as a multifaceted compound disease which is chronic in nature and engages interaction of human beings and environment, (National Heart, Lungs and Blood Institute, 2006).According to natural phenomena, fat is stored in tissues beneath the skin called adipose tissue, in and around the organs and joints. Fat is vital for maintenance of health because it provides energy to the body when needed to keep life progression going, but built up of more fat in the body than necessary may cause multiple health and psychological issues (National Heart, Lungs and Blood Institute, 2006).

In adults obesity and over weight is measured in terms of BMI (Body Mass Index). BMI is a weight to height ratio and is calculated by dividing weight in kilogram by height in meter squared (Kg/m2). National institution of health in America consider a BMI range of 18-25 as Healthy, a BMI between 25-29 as overweight and a BMI above 30 is considered as obese (Patricia Anderson, 2006). While according to American academy of pediatrics, obesity in children can be measured by using body mass index as marker. In children the formula used to measure body mass index is BMI is equal to weight in kilograms divided by height in centimeters and multiplied by 10,000 Joules. After calculation of BMI the center for disease control (CDC) growth charts concludes that BMI between 5th and 85th percentile for child's age and sex group is healthy weight and BMI from 85th to 95th percentile for child's age and sex group is overweight and a BMI equal to or above 95th percentile for child's age and sex group is considered as obese (Green, 2007). Obesity takes place whenever there is an imbalance between energy consumption and energy expenditure and there are several factors involved in this imbalance which includes environmental aspects, lifestyle choices,

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genetic issues and cultural aspects. All these factors play a main part in increasing incidence of obesity all around the world (Grundy, 1998). Becoming overweight or obese poses major threat for chronic illness such as arteriosclerosis, diseases of heart and vessels, type2 diabetes and hypertension, all of which are recognized as basis of morbidity and mortality(Green,1997). childhood obesity similarly also has significant economical, psychological, and social effects apart from health problems for instance academic performance, loss of self esteem, short of self confidence, teasing by peers, prejudice and rejection and other psychological affairs. The long term consequences comprises of less wages, lesser chances of marriage, less education, elevated premiums for life insurance (Gortmaker, and Dietz, 1987).

The ever growing trend of urbanization and industrialization in large number of countries in world today is linked with modification in eating habits especially consumption of high caloric food with little or no nutrient value, behavior, leisure lifestyle and sedentary activities. In the developing countries where there is an evolution taking place, the rising prevalence of obesity coexists with malnourished underweight population **(**Rodgers, and Vaughan, 2002).

In Pakistan as well obesity among children is a budding dilemma**, (**Jafar, and Qadri 2007). Being a developing country it is vital to tackle the matter to reduce the load of disease **(**Misra, and Vikram, 2006). As described by National Health Survey of Pakistan the incidence of obesity is greater in urban than rural inhabitants and it is proportionally related to sedentary behavior, inappropriate eating habits and reduced amount of physical activity (Aziz, and Noorulain, 2009). Child obesity has become a health concern that has grasped attention for the previous some years Though problem of obesity in children has acquired the attention of researchers in Pakistan but still very inadequate information regarding child overweight and obesity is obtainable and there is no genuine national or large scale data on hand and especially in Hyderabad district the present research area, no published study or literature is available however a small number of local or small scale studies are presented which can provide some information about dilemma of obesity in children of Pakistan. According to one such study 6% of kids aged 6-9 years of wealthy families enrolled in costly private institutions of Karachi are obese, while 19.35% children of same age were overweight(Journal Pak Med Assoc.2009).One more study carried out in Lahore in 2010 reveals that 11.9% school going kids were categorized as obese where as 21.8% were found to be overweight (Jayub, 2010).

Regarding worldwide obesity scenario quite accurate international incidence rates of overweight and obesity were prepared among school children of 5-17years in 2004, according to which 10 % of children were overweight, and 2–3 % was obese worldwide. The figures of this approximation recommended that 150–160 million school going children globally were overweight and out of these 35–40 million matches the criteria of obesity. These international statistics includes a vast range of occurrence intensities of child overweight and obesity in a number of sections and nations worldwide, showing that in Africa and Asia the frequency of overweight in school going children averages lower than 5 % and greater than 20% in Europe and states of America.

Present research determines the extent of prevalence of obesity among school going children. As schools are one of the key place for country's pediatric population and adolescence and presents chance for students to learn about healthy eating habits, advantages of exercise and workout. By engaging physical education the schools should give favorable environment and learning about healthy eating, regular physical activity and in this regard physical education in schools can play major role in addressing and avoidance of obesity, which is a mistreated fact in Pakistan. So in view of changing trends in respect of modernizing physical education the present study is also an attempt to switch attention of society towards problem of child obesity and its consequences and to give physical education a professional meaning.

2. MATERIALS AND METHODS

Study Population

The study was limited to middle school children of 6^{th}, 7^{th}, and 8^{th} class. A total of 600 children were included in the study. The sample for study purpose comprised of randomly selected 300 female student and 300 male students and out of these 300 female students, 150 students belongs to public schools and remaining 150 students to private schools. Likewise, out of 300 male students, 150 students were selected randomly from public schools and remaining 150 students from private schools. Convenience sampling method was employed to select 20 schools from the various Talukas (Divisions) of District Hyderabad. Eighteen Schools were selected from urban Talukas including Hyderabad city, Qasimabad and Latifabad and two schools from rural Talukas. A total of 10 public schools and 10 private schools were included in the present study and a sample of 30 students from each school were selected randomly, precisely 10 children from 6^{th} class, 10 students from 7^{th} class and 10 students from 8^{th} class. As suggested by Singleton and Straits (1993), convenience

sampling consists of selecting a required sample number from subjects which are available conveniently

Study Tools

Body Mass Index (BMI) measurement

In order to compute BMI for age the body weight of each student was measured to the nearest 0.1 kilogram. The height was measured to the nearest 0.1 inch and then converted to meters, using GV-556 measuring tape. The age in years of the students was also documented.

Categories of weight profile for estimated BMI for age percentiles were then established. According to which the children who scored < 5^{th} percentile were considered as underweight, the children who scored > 5^{th} and < 85^{th} percentile were considered as healthy weight, children who scored > 85^{th} and < 95^{th} percentile were considered as overweight and children who scored > 95^{th} percentile were considered as obese.

Statistical analysis

The data collected from the study was analyzed by using SPSS version 15. Descriptive statistics (such as percentage, mean, and standard deviation) were utilized to describe the data. To elucidate Body Mass Index (BMI) count, percentile ranks were then employed. To establish the association of gender and type of school on BMI values, (Independent sample t-test) was used. For all the hypotheses the significance value at 0.05 was considered as an independent variable.

3. RESULTS

Table.1. Demographic and Anthropometric Characteristics of female/male students (n=600)

Type of School	Total no. of students		Age (Year)				Height (Inches)			
			Mean		± SD		Mean		± SD	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Public	150	150	12.63	13.36	1.23	1.03	58.13	61.04	2.68	3.91
Private	150	150	12.19	13.01	0.93	1.17	57.87	59.94	2.62	5.91
Both	300	300	12.408	13.19	1.1212	1.1186	57.94	60.50	2.7097	5.022

Source: Self survey 2010

Table-1. Shows the demographic and anthropometric characteristics of female and male students of public and private schools. Where mean age of total 300 female students was 12.408 years with ±SD 1.1212. Whereas the mean age of 150 female students of public and private school each and was 12.63 years, ±SD1.231 and 12.193 years ±SD 0.9389 respectively whereas mean height was 58.13´´ with ±SD 2.68. and 87 60.50 with ±SD 2.6286 respectively. In males students (300) mean age of public and private schools was 13.193 years, ±SD1.1186. Whereas the mean age of 150 male students of public school was 13.368 years ±SD1.0321 and mean height was 61.045´´ with ±SD 3.910. While 150 male students belonging to private schools recorded a mean age of 13.193 years ±SD 1.177 and estimated mean height was 59.947, ±SD 5.91

Table.2. Distribution of BMI for age in percentile of Female/Male students of public and private schools (Percentages are given in Parenthesis)

BMI for age	Female students			Male Students		
	Public Schools	Private School	Both	Public Schools	Private School	Both
Under weight % BMI of P<5^{th}	11 (7.34)	0 (0)	11 (3.7)	2 (1.3)	3 (2.0)	5 (1.7)
Healthy Weight % BMI of P>5^{th}<85^{th}	100 (66.66)	105 (70.0)	205 (68.3)	102 (68.0)	102 (68.0)	204 (68.0)
Over Weight % BMI of P>85^{th}<95^{th}	25 (16.67)	19 (12.66)	44 (14.7)	18 (12.0)	19 (12.7)	37 (12.3)
Obesity % BMI of P>95^{th}	14 (9.33)	26 (17.34)	40 (13.3)	28 (18.7)	26 (17.3)	54 (18.0)
Total	**150**	**150**	**300**	150	150	300

Source: Self survey 2010

Table 4 indicates the distribution of BMI for age in percentile of both female and male students belonging to public and private schools. According to results, out of 300 female students 3.7% (11) were categorized as underweight, 68.3% (205) were healthy weight, 14.7% (44) were estimated as overweight while 13.3 (40) were categorized as obese. Whereas out of 300 male student of public and private schools 1.7% (5) were under weight, 68% (204) were healthy weight, 12.3% (37) were evaluated as overweight and 18% (54) were categorized as obese. Distribution of BMI for age in percentile was also computed for total of 600 participants by combining results of both female and male students. The results indicate that 2.7% (16) children were under weight, 68.2% (409) were healthy weight, 13.5% (81) were overweight and 15.6% (94) children were categorized as obese.

Table. 3. Prevalence Means, Standard deviations and independent t values of BMI estimates of female/male students by type of school.

School	N		$\bar{x}$		±SD		t	t	Df		Sig	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Public	150	150	72.95	76.77	38.55	37.08	-1.695	.102	298	298	0.091	0.919
Private	150	150	76.34	76.33	37.73	37.68						
Total	300	300	-	-	-	-						

Source: Self survey 2010

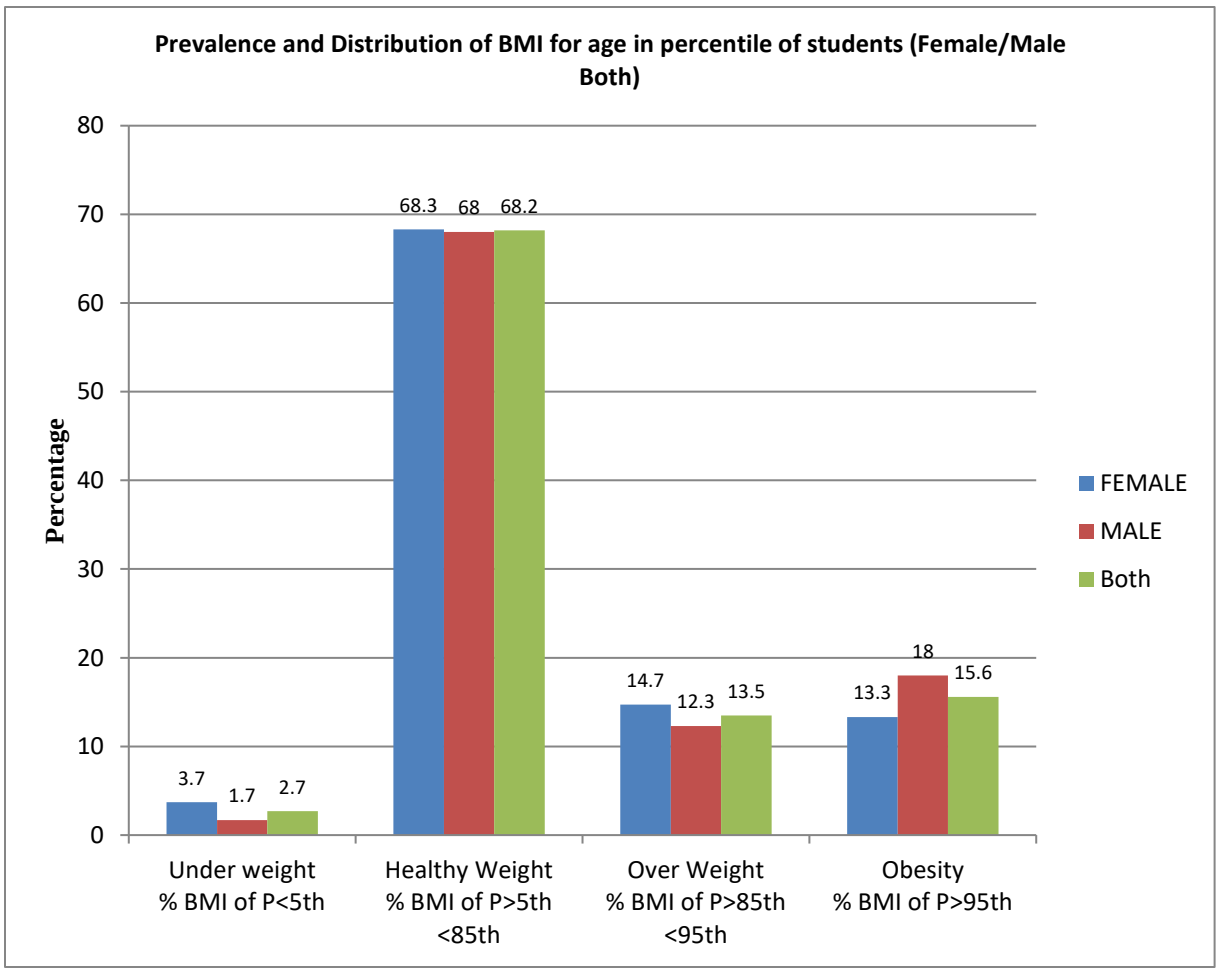

Fig.1 Distribution of BMI for age in percentile of female/male students of Public and Private Schools

4. DISCUSSION

Prevalence of obesity among female and male middle school children of public and private schools of Hyderabad District was 13.3% and 18.0% respectively. Highlighting the alarmingly high rates of child obesity and an emerging public health problem for the developing countries like Pakistan which may will generate a massive public health cost in coming years. This trend is similar with international trends of child obesity monitored in the developed nations as in United States (Wang and Lobstein, 2006).

Contemporary lifestyle such as less physical activity and more sedentary behavior and unbalanced eating, high content of saturated fats, sugar and refined foods are the likely reasons of the budding child obesity outbreak in the developing countries (Popkin, 2007).

In Pakistan, current research is one of the few to account child obesity prevalence revealing that the rate of obesity was higher in male students than in female students with statistically significant association, which is consistent with the results observed in (urban India, Brazil, Finland, Canada, and Asian-Americans in United States) (Ramachandran, and Snehalatha, 2002). Type of school (public and private) specific prevalence rates reveals that boys of public school recorded highest BMI scores whereas girls of public schools recorded lowest BMI scores Prevalence of obesity was greater in females of private schools than public schools, consistent with a study in Brazil (Oliveira, and Oliveira, 2007). While girls and boys of private schools scored approximately similar obesity rates. A likely reason for greater prevalence of obesity among boys might be the fact that in our society parents pamper boys, particularly in feeding practices and doing house hold work, besides parents does not approve of their sons to lose weight, maybe because they see fatness as a sign of prosperity and more muscular ideal image of male rather health issue. Efforts to prevent child obesity should be made on all fronts and targeted interventions, tailored to local circumstances and involving communities, should begin early in life knowing that obesity is prevailing among school going children there is an urgent need of life style modifications, help in developing the prevention and intervention strategies to improve the BMI status of students.

5. CONCLUSION

Present research concludes that obesity is prevalent among middle school children where male students have slightly higher BMI scores compared to BMI scores of their female counterpart, while comparing public and private schools, interestingly male students belonging to public schools have shown higher BMI scores than private schools. On the other hand female students of private schools have higher prevalence of obesity than public schools. The high prevalence of obesity among school children clearly seems to be the result of sedentary lifestyle, lack of recommended moderate to vigorous activities on daily basis as well as large consumption of calories in the form of junk or fast food such as such as burgers, pizza, soft drinks bakery statements and French fries etc. However, no efforts have been made to establish facts and associated issues in relation to child obesity.

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