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A STUDY TO ASSESS THE OBESITY AND ITS DETERMINANTS AMONG SCHOOL GOING ADOLESCENTS IN HYDERABAD

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ABSTRACT

Background: Obesity, once considered a problem of developed countries, is now growing enormously in many developing countries also. Changes in diet and physical activity raise the prevalence of obesity in children.

Methodology: A cross sectional study was conducted among students of standard VIII – X in Hyderabad. Schools were selected from list of schools randomly. Total 763 children were included in study. Pre-tested questionnaires were used to collect information. The data was analyzed by using appropriate statistical tests.

Results: In present study 49.02% were boys and 50.98% were girls. Majority of children belong to 13 years age group, and class-2 socio economic standard. About 58% of study population are from government school. Prevalence of obesity was 3.5% and it is more among girls and class-I socio economic status. There is significant association between obesity and excess calories intake, bakery and fatty food consumption, lack of physical activity, sedentary life style and family history.

Conclusion: It was concluded that main modifiable risk factors of obesity among school going children were junk food and sedentary life style.

Key words: Adolescent, Junk food, Life style, Obesity, School children

INTRODUCTION

Obesity is one of the most prevalent nutritional diseases of children and adolescent in many developed and developing countries. Childhood obesity is global problems that are on the rise.[1] During the past two decades, the prevalence of overweight and obesity in children has increased worldwide.[2] Obesity in childhood and adolescence has adverse consequences on premature mortality and physical morbidity in adulthood.[3] 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.[4] Obesity has increased markedly in India because of nutritional and socio-economic transitions as well as the behavioural transition of children. Increased consumption of Junk food, fast food and energy rich foods has replaced healthy homemade meals. There are lack of exercise, computer gaming and television viewing replaced the outdoor games. This attitude has altered the lives of children.

Studies on urban Indian school children from selected regions report a high prevalence of obese and overweight children[5]. There are studies, that reporting the prevalence of childhood and adolescent obesity and overweight from different parts of India (Punjab, Maharashtra, Delhi and south India) that range from 3% to 29% and it also indicate that the prevalence is higher in urban than in rural areas[6]. Invariably obesity is a product of imbalance between energy intake and energy output. Several

factors such as over eating, psychological factors, sedentary life style and genetic predisposition trigger this energy imbalance. Social, educational, economic, cultural, psychological and personal factors also play a key role in food behaviour. WHO has also emphasized the urgent need of understanding the prevalence trend and influencing factors of childhood obesity. Results of such studies are helpful in development of intervention strategies to halt the emerging epidemic of childhood obesity. Success of adult obesity prevention is firmly based on prevention of childhood obesity. With this background we had initiated to undertake the present study whose objective was to estimate the prevalence of obesity and identify the factors influencing the obesity among high school children aged between13 to16 years.

METHODOLOGY

The present cross sectional study was conducted in 5 schools (3 government and 2 private school), of field practice area of Deccan College of Medical Sciences, Hyderabad. The study was conducted among students of standard VIII – X, aged 13 to 16 years between a period of August 2013 to July2014. Previous studies (WHO 2005)[1], De Onis (2010)[2], Reilly J (2011)[3] show that prevalence of obesity in adolescence is 12 to 15%. Considering 12% of prevalence and by using the formula, $n=4pq/L^2$, sample size determined was 734. Present study was approved by ethical committee of Deccan College of Medical Sciences Hyderabad. The list of school with number of students in each school was obtained. Schools were selected from the school list by using simple random sampling technique till the desired number of sample size is met. Before a school was taken for the study, head of the institution was contacted, purpose of the study was explained and permission was obtained. Consent was also taken from parents through school authority. Sampled schools were visited on a date given by school authority. By this procedure 800 children were drawn from 5 different schools. Importance of the study was explained to the children and encouraged them to participate in the study. Children having chronic illness, endocrinal problems, physical and mental defects, those who were absent on the day of data collection and those who did not get the consent from the parents were not included in study population. Finally 763 children were included in study. Pilot study was done on 100 school children and questionnaire and data collection technique was refined accordingly. Pretested questionnaires were used to collect personal information, socio-economic particulars, life style patterns, and dietary habits. BMI was calculated by formula weight(kg)/height(m^2). [7] Based on the BMI charts developed by IAP, Percentile for BMI was taken as a standard for the present study.[8] Vegetarians were those who eat only vegetables and do not eat meat, chicken and egg at all and non vegetarians were those who eat meat, chicken and egg along with vegetables. Pizza, samosa, chips, burgers, noodles and other fast foods were considered as fatty foods. Biscuits, Cakes and Pastries were considered as baked food. As it was found difficult to measure the quantity of snaking in the pilot study hence frequency of snaking is taken into account. Playing outdoor games, physical exercise, walking, cycling, swimming and physical training (PT) in school were considered as Physical activities and attending schools, tuitions, reading, homework, watching television, playing computer games, sleep were considered as sedentary activity. The data entered in excel spreadsheets and analyzed by using SPSS (version 17). Students having underweight were excluded from statistical analysis. Odds ratio was used to measure strength of association and P-value of 0.05 or less was considered for statistical significance.

RESULTS

In this study 763 children were participated, 374 (49.02%) were boys and 389(50.98%) were girls.

Table -1: Socio economic characteristics of study population (n=763)

Socio economic characteristics	Subjects (%)
Age (Years)	
13yrs	282 (36.96)
14yrs	251 (32.9)
15yrs	180 (23.59)
16yrs	50 (6.55)
Sex	
Boys	374 (49.02)
Girls	389 (50.98)
Standard of Studying	
8th Standard	252 (33.03)
9th Standard	259 (33.94)
10th Standard	252 (33.03)
Socio Economic Class	
Class-I	35 (4.58)
Class-II	404 (52.94)
Class-III	260 (34.07)
Class-IV	63 (8.26)
Class-V	1 (0.13)
Dietary Pattern	
Vegetarian	157 (20.58)
Non Vegetarian	606 (79.42)
Type of School	
Government	324 (42.46)
Private	439 (57.54)
Body Mass Index	
Underweight	402 (52.69)
Normal	334 (43.77)
Over Weight and Obese	27 (3.54)
Total	763 (100)

Table-2: Prevalence of overweight and obesity by socio economic characteristics. (n=361)

Variables	Obese (n=27)	Normal (n=334)	Odds Ratio	CI 95%	P value
Age					
13 years	10 (37)	104 (31.1)	1		
14 years	6 (22.2)	117 (35)	0.5	0.18-1.5	0.27
15 years	7 (25.9)	91 (27.2)	0.8	0.29-2.18	
16 years	4 (14.8)	22 (6.5)	1.89	0.5-6.58	
Sex					
Girls	20 (74)	165 (49.4)	2.96	1.2-7.1	0.02
Boys	7 (26)	169 (50.6)	1		
Socio Economic Class					
Class-I	6 (22.2)	18 (5.3)	7.66	0.84-69.52	0.009
Class-II	13 (48.1)	195 (58.3)	1.53	0.19-12.27	
Class-III	7 (25.9)	98 (29.3)	1.64	0.19-14.02	
Class-IV&V	1 (3.7)	23 (6.8)	1		
Types of School					
Private	23 (85.1)	120 (36)	3.22	1.08-9.54	0.04
Government	4 (14.8)	214 (64)	1		
Family History					
Present	7 (25.9)	13 (39)	8.64	3.1-24.06	<0.001
Absent	20 (74.1)	321 (61)	1		

Table-3: Association between diet and obesity. (n=361)

Variables	Obese (n=27)	Normal (n=334)	Odds Ratio	95%CI	P Value
Dietary Pattern					
Vegetarians	6 (22.2)	49 (14.6)	1.6	0.23 – 1.56	0.44
Non-vegetarians	21(77.8)	285 (85.4)	1		
Recommended Dietary Allowance					
>RDA	19 (70.4)	159 (47.7)	2.61	1.11-6.13	0.03
<RDA	8(29.6)	175 (52.3)	1		
Bakery food per week					
1&2 Times	11(40.7)	232 (69.4)	1		0.008
3&4 Times	14 (51.8)	91(27.4)	7.25	1.42 – 7.41	
5&6 Times	2 (7.4)	11(3.2)	3.83	0.75 –19.45	
Fatty food per week					
1&2 Times	9 (33.3)	210 (62.8)	1		<0.001
3&4 Times	13 (48.1)	119 (35.6)	2.54	1.05 – 6.14	
5&6 Times	5 (18.5)	5 (1.5)	23	5.7 – 95.38	

Table-4: Association between physical activities and obesity. (n=361)

Variables	Obese (n=27)	Normal (n=334)	Odds Ratio	95%CI	P value
Physical Activities					
1-2 hrs	19 (70.3)	154 (89.1)	1		0.014
3-4 hrs	7 (25.9)	134 (95.1)	0.42	1.17-1.03	
5-6 hrs	1 (3.7)	46 (97.9)	0.17	0.02–1.35	
Sedentary Activities					
16-18 hrs	1 (3.7)	14 (93.4)	1		0.04
19-21 hrs	7 (25.9)	166 (96.0)	0.5	0.06-5.1	
22-24 hrs	19 (70.3)	154 (89.1)	1.7	0.21-13.88	
Mode of Conveyance					
Walking	11 (40.7)	154 (46.1)	1		0.5
Bicycle	8 (29.6)	76 (22.7)	1.47	0.56-3.81	
Bus	6 (22.2)	53 (15.8)	1.58	0.55-4.49	
Others	2 (7.4)	51 (15.2)	0.54	0.02-1.35	

About 37 % of children belong to 13 years age group, 33 % 14 year, 24% 15 year and 7% 16 years of age group. About 33% are from 8th standard, 34% are from 9th standard and 33% are from 10th standard. Only about 4.5% children belong to socio economic class-1, majority of children belongs to class-2, and class-3 (53% and 34% respectively). Among 763 children about 20% were vegetarian and nearly 80% were non vegetarian. About 58% of study population are from government school and 42% were from private schools. In our study we found that prevalence of obesity was 3.5% (27 chil-

dren) while 402 children i.e 52.7% were underweight and 334 children i.e. 43.4% were normal. (table 1)To analyze the association of obesity with other factors, underweight children were excluded from further analysis. Hence subsequent analysis was done on 361 children i.e. 27 obese and 334 normal.

In this study we found that obesity were more among girls (10%) compare to boys (4%). and among class-I socio economic status, it was high (25%) and least in class-IV and V (4%). We also found that prevalence of obesity was more among private school children (9.7%) compare to government school children (3.2%) and it is also high among children with family history of obesity (35 %) compare to 6% without family history. By doing odds ratio we found that girls had 2 times risk of being obese than boys. We also found that chance of developing obesity was 3 times more among private school students compare to government school and 8 times more among the children with family history of obesity compare to without family history. (table 2).

In our study we found that there was significant association between obesity and excess calories intake, bakery and fatty food consumption. Obese children were more among the group who took daily calories above RDA (10%) and they had 2 times more risk of developing obesity compare to 4% among those who took daily calories below RDA. Obesity was more among children whose consumption of bakery food was more than 4 times a week (15%) compares to children who consume bakery food less than 2 times a week (4%). Obesity among children who consume fatty foods 5 or more times per week was 50% than those who consume fatty food 1or 2 times in a week (4%). We also found that if child was taking fatty foods 3-4 times daily than risk of obesity was 2.5 times while risk increased to 23 times if they take fatty food 4-5 times daily. (table 3). This study found strong association between physical activity, sedentary life style and obesity. Prevalence of obesity increased from 2% among those who do 5 to 6 hours of physical activities to 10% among children who do 1 to 2 hours of physical activities. Similarly prevalence of obesity was more (10%) among students with 22 to 24 hours of sedentary activity. (table 4).

DISCUSSION

Pertinent to our objectives 763 high school children drawn from 5 selected high schools, age between 13 to 16 years of both private and government school of field practice area of Deccan College of Medical Sciences, Hyderabad. In this study out of 763 children, 402 (52.69%) are underweight, and 27 (3.5%) were obese. In a study done on prevalence of obesity among high school children in Dakshina Kannada and Udupi Districts by Keerthan Kumar, the overall prevalence of obesity was found to be 2.6%.[9] Similar results i.e. prevalence of obesity were found to be 2.8% in a study by Mishra.A.[10] In a study done by Mahajan Preetam, prevalence of obesity was 2.12%.[11] We found that obesity was more among girls. Similarly in a study done by Sonya Jagadesan in Chennai it was observed that girls had 1.13 times greater odds of being obese than boys[12]. Similar results were also found in study by Kotian et al[13] (10.5% Vs 9.3%) and Kumar et al (8.82%Vs 5.59%)[14]. This high prevalence of obesity among girls may be because of less physical activities in girls. We found that obesity was more among private school children. Similar result i.e. high prevalence of obesity among private school children (7.2%) compare to government school children (4.9%) were also found in a study done by Yamani Ramachandran in Kerala.[15] This may be because of mostly private school students belong to higher socio economic class and have sedentary life style and more consumption of junk foods as our study also found that obesity were more in children belonging to SES- 1. This shows that as the socio-economic status improves the prevalence of overweight and obesity increases. Similar results of high prevalence of obesity among upper socio-economic groups were also reported in other studies by Ramachandran (2004)[15] and by Shabana et al(2009)[16].

We found that chances of obesity were more among children having positive family history. Sheetal Monga(2004)[17] and Meenu Singh(2005)[18] also reported family history as an important factor for development of obesity in children. We found that the risk of obesity was significantly high in those; the daily calorie intake was more than the RDA. These findings were similar to that of study done by Subhash(2011)[19], Seema Jain et al(2010)[20], Bhave S et al(2004)[21] and Kapil et al(2005).[6] We found that obesity was more among children who consume more bakery food and fatty food. Similar finding of high obesity rate among junk food and fatty food eaters was also reported by many studies from different part of India by S. Kumar et al in Karnataka (2011),[14] Rajaat vohra et al in lucknow city(2007),[5] Goyal RK Ahemedabad (2010),[22] Seema Jain et al in Meerut (2010), [20] Keerthan kumar N in Dakshina Kannada and Udupi Districts (2011).[9] We found that prevalence of obesity was more among children having sedentary life style and lack of physical activities. Similar results of high risk of being obese among children heaving lack of physical activities like outdoor games were reported in the studies done by S. Kumar et al(2007),[14] Kotian et al(2010)[13], and Rajaat vohra et al(2011).[5] In a

study at Punjab by Meenu Singh reported sedentary life style like watching TV or Video for more than one hour daily contributed to childhood obesity[18]. Increase calories intake especially in the form of junk food and fatty and decrease expenditure by sedentary life style and lack of exercise increase the risk of obesity.[7]

CONCLUSION

From the findings and discussion of the study, it was concluded that obesity among school going children was 3.5 percent and more among girls and high socio economic class. Genetic also play an important role as chance of being obese increase if parent are also obese. Main modifiable risk factors were high calories consumption in the form of junk food and sedentary life style.

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