Prevalence of Obesity in Adolescent and Related Risk Factor in Surat City

Rajiv Prasad[1], Vibhuti D Vaghela[2], Hina Kuvadiya[3], Yogesh Labana[4]

Author's Affiliation:
[1]Additional Professor; [2]Assistant Professor; [3]Resident, Dept of Pediatrics, SMIMER, Surat; [4]Consultant, Zalod

Correspondence
Dr. Vibhuti D Vaghela
drvibs18@gmail.com

ABSTRACT

Background: Obesity is one of the most widespread and a major problem affecting children and adolescents is of global nutritional concern. Obesity is multifactorial disease prevalence and risk factor varies according to place, race, genetics, cultural practices, food habits and economic status.

Objectives: To assess prevalence and identify probable risk factors for of obesity and overweight in high school children of Surat. Methods: This Cross-sectional study was conducted among adolescent students. Students were divided in overweight & obese and normal based on BMI. Both the groups were compared based on socio-demographic profile and risk factors like dietary history, physical activity, family history of HT, DM and obesity, etc.

Results: In our study the overall prevalence of obesity is 7.4% and overweight is 9.9%. Overweight and obesity was significantly associated with more expected calorie intake, frequent restaurant visits, regular consumption of fast food/ junk food, sedentary activities, using bus/car/auto as a transportation for going to school, upper and upper middle socioeconomic class, family history of diabetes mellitus, obesity and hypertension (P value <0.001).

Conclusion: The prevalence of obesity is increasing due affluent lifestyle.

Key words: Obesity, overweight, adolescent, risk factors, Surat.

INTRODUCTION

Obesity is one of the most widespread and a major problem affecting children and adolescents is of global nutritional concern. An increased prevalence is found in many countries where the major nutritional disorder previously was malnutrition[1]. Increase in prevalence of childhood obesity is associated with potential medical complications of obesity noted in adolescence and especially in adulthood, like hypertension, coronary artery disease, diabetes mellitus, dyslipidaemia, cholecystitis, pancreatitis, sleep apnea and osteoartritis.[2, 3]

In the last two decades, the prevalence of obesity has doubled in children and tripled in adolescents in United States of America, the increase in childhood and adolescent obesity has resulted in increase in obesity or overweight in adults[4.] Evaluation of obesity in childhood is important for several reasons. Firstly; it offers the best hope for preventing obesity and secondly preventing progression of disease which is associated with many diseases in adulthood. Obesity is multifactorial disease prevalence and risk factor varies according to place, race, genetics, cultural practices, food habits and economic status.

METHODOLOGY

This Cross-sectional study was conducted during August 2012-April 2013 enrolling all students of 8th to12th standard from 5 schools of Surat [3 were government and 2 were private schools], prior permission of principal concerned school, ethical committee and verbal consent of students had been taken. The dietic history was assessed by asking main servings, number of junk food consumption

at home/outside and consumption of juices & carbonated drinks. The physical activity was assessed by frequency of exercise, outdoor games & mode of transport and sedentary lifestyles was assessed by duration of watching television, computers and day time sleep. The following physical exercises were included: Walking briskly, Swimming, Running, jogging, race walking, Aerobics. The following games were included: Volleyball, football, basketball, Cricket, Kabaddi, Kho-Kho, Badminton, Lawn-tennis, and Table-tennis

Measurements: Consisted of Height and Weight. Height: It was measured using the standard calibrated bar by using Frankfurt plane in cms. Weight: It was measured using a standard portable weighing machine & the scale was zeroed before each session & weight was recorded in Kgs.

BMI is calculated and children are identified as overweight if BMI is more than 85th percentile and obese if BMI more than 95th percentile rest are considered normal irrespective of BMI. Percentile charts used were published in Indian pediatrics. (IAP Growth Monitoring Guidelines for Children from Birth to 18 Years: Indian pediatric 2007)[5]

RESULTS

Total 1199 students were enrolled from 5 schools that satisfied inclusion criteria.

Table 1: Socio- demographic factors affecting obesity /overweight

Factors	Obese/OW (n= 208)(%)	Normal (n=991) (%)	P value
Sex			
Boys	135(64.9)	619(62.46)	0.5
Girls	73(35.1)	372(37.54)	
Transport type			
Bus /car	155(74.52)	570(57.5)	0.005
Cycle	8(3.85)	28(2.8)	
Walking	45(21.63)	393(39.7)	
Socioeconomic class			
Upper	122(58.66)	406(40.99)	<0.001
Upper middle	42(20.19)	50(5.04)	
Middle/lower middle	35(29.42)	363(36.62)	
Upper lower	9(7.56)	105(10.59)	
Lower	0	67(6.76)	
Type of school			
Private school	142(68.27)	456(46.01)	0.018
Government school	66(31.73)	535(53.99)	
Family history of obesity			
Yes	50(24.04)	152(15.34)	<0.001
No	158(75.94)	839(84.66)	
Family history of DM			
Yes	21(10.1)	38(3.8)	0.0147
No	187(89.9)	953(96.2)	
Family history of HT			
Yes	21(10.1)	62(6.3)	0.047
No	187(89.9)	929(93.7)	

OW=Overweight

Out of this 598(49.87%) from private school and 601(50.13%) were from government school.

In our study overall prevalence of obesity is 7.4 %(89) and overweight is 9.9 %(119). The prevalence of obesity and overweight in boys was 8.8% and 9.2% respectively and prevalence of obesity and overweight in girls was 5.2% and 11.2% respectively.

As shown in table-1, 64.9% boys and 35.1% girls were obese while 62.46% boys and 37.54% were normal that is not sigficantally associated. In our study obesity /overweight was significantly seen in students who were going to school by bus/car (P value 0.005), those who were from private school (P value 0.018) and from upper and upper middle socio-economic class (P value <0.01). Obesity /overweight was significantly associated with family history obesity (P value <0.001), Diabetes mellitus (P value 0.0147), Hypertension (P value0.047).

Table-2: Modifiable risk factors affecting obesity /overweight

Factors	Obese/OW (n=208)(%)	Normal (n=991)(%)	P value
Calorie intake			
More than expected	71(34.14)	30(3)	<0.001
Less than expected	137(65.86)	961(97)	
Fast food consumption			
Regular	117(56.25)	149(15)	<0.001
Occasional	91(43.75)	842(85)	
Restaurant visit/week			
>=2times	57(27.4)	105(10.6)	<0.001
<2times	151(72.6)	886(89.4)	
Home snacks/day			
>=2times	146(70.19)	566(57.1)	0.048
<2times	62(29.81)	425(42.9)	
Junk food consumption/week			
>=3times	96(46.15)	230(23.2)	<0.001
<3times	112(53.85)	761(76.8)	
Indoor activity			
>=3hour	116(55.77)	304(30.7)	<0.001
<3hour	92(44.23)	687(69.3)	
Outside playing			
Daily	44(21.15)	305(30.8)	0.054
Week/none	164(78.85)	686(69.2)	
Daily exercise			
Yes	26(12.5)	729(73.6)	<0.001
No	174(87.5)	262(26.4)	
Daytime sleep			
Yes	93(44.71)	347(35)	0.0834
No	115(55.29)	644(65)	
Type of feeding			
EBF	197(94.71)	986(99.5)	<0.001
Mixed formula feed	11(5.29)	5(0.5)	

OW=Overweight

As shown in table -2 obesity /overweight was significantly seen in students who were taking more than expected calories in diet (0.001), fast food on regular base (P value 0.001), >=2 times restaurant visit in week (P value 0.001),>=2 times home snacks/day (P value 0.0048),>=3 times Junk food consumption/week (P value <0.001),>=3hour Indoor activity (P value <0.001), outside playing(P value 0.0054), daily exercise(P value <0.001). In this study we found that daytime sleep (P value 0.00834) and exclusively breast fed (P value <0.001) child was having significant negative correlation with obesity.

DISCUSSION

In our study prevalence of obesity was 7.4% which was similar to Umesh kapil et al[6] (7.4%) and Marwah et al[7] (7.6%). In our study prevalence of overweight was 9.9% which was similar to M Shashidhar et al[8] (9.9%) and Jalaja kumara et al[9] (8.8%). The prevalence of obesity was higher in male as compared to female (in boys 8.8% and girls was and 5.2% respectively, similar results found in Goyal et al[10] (in boys 6.7%and in girls 6.45% respectively) and in Umesh kapil et al (in boys 8.3%and in girls 7.4% respectively). The prevalence of overweight in boys and girls was 9.2% and 11.2% respectively, similar findings seen M Shashidhar et al (in boys 9.3%and in girls 10.5% respectively) and Jalaja kumara et al (in boys 6.9%and in girls 9.1% respectively). In our study it was found that prevalence of obesity increased in both male and female as the age increased, which is similar to Goyal et al study.

In our study 50.6% obese were having history of more than expected calories intake, which was almost similar to Sina Aziz et al[11] [46%]. Parimalavilli et al[12] study says that positive energy balance was considered as predisposing factor of obesity among adolescents. 70.8% obese are taking fast food regularly, which is almost similar to Keerthan Kumar M et al[13] [66.6%]. In the present study found that 43.8% obese are eating junk food >2 time in their outside snack per week which is almost similar to Tarek taukif et al[14] [42%]. In our study it was found that 34.8% obese and 21.8% overweight are taking restaurant visit more than 2 times per week, similar finding seen in Paul J vengelers et al[15] and T Agrawal et al[16] while in Goyal et al 89% of obese and 86% overweight were taking restaurant visit more than 2 times per week. Study conducted by Paul J vengelers et al and Mohanty et al[17] reported that junk food consumption is most influencing risk factor for obesity. Study conducted by T Agrawal reported that youngster prefer to go outside with their friends for meals, though families also go out together. Majority of adolescents like to eat meals out of home and prefer junk food

over regular meals. Study conducted by Garvita jain et al[18] reported that type of diet [vegetarian, eggeterian and nonvegeterian], junk food, frequency of eating pattern and eating behavior in front of tv etc have special role in obesity. Majority of adolescent like to eat meals outside home and prefer junk food over regular meals.

In our study it was found that 82% of obese are using car/automobile for their transport for going to the school, similar observation seen in Goyal et al [93.5%]. In our study it was found that 87.6% obese were not doing daily exercise similar observation seen in Goyal et al [84.3%]. Study conducted by Paul J vengelers et al, Mozaffari et al[19] and S Kumar et al[20] reported signification relation between lack of daily exercise and obesity. 51.7% obese are spending their >/3hours in the indoor activity like watching TV, computer and videogame which is similar to T Agrawal et al [55%]. Parimalavalli et al reported that the sedentary lifestyle of children and adolescent have been attributed mainly to television viewing, computer games, internet which is the major risk factor for development of obesity. So children should be encouraged for doing exercise and outdoor games.

Prevalence of obesity is higher in students of private school that is 11.2% as compared to government school has only 3.7% similar findings were in Subraya et al[21] (prevalence of obesity is higher in private school that is 10.3%). Because most of the student in the private school belongs to higher family, thus socioeconomic status seems to play importance role in the determination of obesity, because in higher society life style and food habits are the major contributing factor. In our study it was found that prevalence of obesity and overweight is higher in upper and upper middle class (79%) compared to normal adolescents (0%) while in Subraya et al the prevalence of obesity in higher and upper middle class is lower(39%). Higher socioeconomic status plays important role in the development of obesity, because in higher society life style and food habits are the major contributing factor.

36% obese adolescent's parents having history of diabetes mellitus in our study while in study by yi chun chao[22] [56.7%] and Subraya et al[18.45%] having similar history of DM. In the study conducted by Marwah et al reported that parental obesity may increase the risk of obesity through genetic mechanism or by shared family characteristics in the environments such as food preference.

CONCLUSION

In our study the overall prevalence of obesity is 7.4% and overweight is 9.9%. The prevalence of

obesity is higher in males as compared to females. More than expected calorie intake, frequent restaurant visits, regular consumption of fast food/ junk food, sedentary activities [watching TV more than 2 hours, playing video games and computer], using bus/car/auto as a transportation for going to school, upper and upper middle socioeconomic class, family history of diabetes mellitus, obesity and hypertension are responsible factors for the development of obesity. Exclusive breast feeding and daily regular exercise is found to be protective against development of obesity.

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