Prevalence of Overweight among the Students of A Selected Urban School

A S M Zulfiquer Ali[1*]

Abstract

Background: Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Body Mass Index (BMI) is a simple index for weight for height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilogram divided by the square of his height in meters (kg/m^2). To estimate the prevalence of overweight and obesity among the students of Bangladesh International School and College, Mohakhali, Dhaka.

Materials and methods : This descriptive cross-sectional study was conducted from July 2019 to November 2019 among purposively selected 201 students of class VI to X of Bangladesh International School, Mohakhali, Dhaka. Data were collected through face to face interview using pre-tested structured questionnaire. Data were checked for quality control and analyzed by computer by using SPSS software version 23.

Results: Mean age of the students was 13.42 ± 0.38 years. Out of 201 respondents 45 from class VI, 41 from class VII, 39 from class VIII, 36 from class IX and 40 students from class X. The highest 20.9% respondents are from 14 years age. Majority (51.2%) respondents were female and rest 48.8% were Male. The overall proportion of overweight among the respondents was found to be 18.4%. Association between overweight and age, sex, class, Occupation of mothers of respondent, monthly family income, frequency of snacks and daily calorie intake, and duration of outdoor games or physical activity were found significant.

Conclusion: In this study it was revealed that the prevalence of overweight among the students of selected school was 18.4%. Boys were more overweight than the girls. Higher percentage of overweight adolescent was found among the affluent families. Adolescent students who took more calorie in daily diet the prevalence of overweight was more in them.

Key words: Prevalence of overweight; School students; Urban school.

1. Assistant Director of Medical Services (ADMS)
   10 Infantry Division, Ramu Cantonment, Cox's Bazar.

*Correspondence: Dr. Col A S M Zulfiquer Ali
            Cell : 01711 46 33 03
            E-mail: zulfiquer19@gmail.com

Introduction

Overweight and obesity are conditions caused by an increased in size and amount of fat cells in the body. These conditions together represent the second leading preventable cause of death in the United States. Obesity is a serious, chronic disease that can inflict substantial harm to a person's health. Overweight and obesity are not the same, rather they are different points on a continuum of weight ranging from being underweight to being morbidity obese. The percentage of people who fit into these two categories overweight and obese, is determined by Body Mass Index (BMI).

Adolescents overweight is defined whose BMI is >85th percentile. Obesity is often defined simply as a condition of abnormal or excess fat accumulation in the adipose tissue, to extent that health may be impaired.[1] Now a days, obesity has become a global pandemic and is still increasing in both industrialized and developing countries. The prevalence of obesity among children in United States increased by 100%between 1980 to1994. Present national estimates indicate that 24% and 11% of children are above the 85th and 95th percentiles of Body Mass Index (BMI) for age and sex respectively. There are many long term adverse effects of childhood obesity, the prevention of child obesity has been recognized as a public health priority. Childhood obesity has a profound influence on morbidity and mortality in adult life.[2]

It is estimated that, the prevalence of child overweight and obesity has doubled in North America during the past two decades. At present, about one-quarter of children in the United States are obese. Various environmental and social factors relating to diet and physical activity have been identified that could contribute to obesity.[3] Alteration in dietary constituents including higher derivation of energy from nutritionally poor and energy dense foods, increased sweetened drink consumption, larger portion sizes and more frequent intake of food outside the home have

been with poorer diets and higher weight. Socio-economic status and place of residence are also important contributors. These factors together comprise an obesogenic or toxic environment where the development of obesity is the expected course for human leading lifestyles incompatible with their evolutionary development.[4]

Moreover, Physical activity has reduced with decreases in school physical classes and organized sports, fewer opportunities to expend energy for daily activity, lower frequency of walking and biking and more use of sedentary activities for leisure. Television watching remains the most common activity for children. Possibly, the most prevalent sedentary behavior in western society is television watching. In a study it was revealed that significant relationships between child Body Mass Index (BMI) and television watching. An intervention reducing hours of television viewing showed a promising reduction in BMI increments in American primary school children.[5]

There are studies suggest that decreased physical activity and increased sedentary behavior plays an important role in weight gain and the development of obesity.[6]

Adolescents who are obese often experience significant social pressure, stress and difficulties accomplishing developmental tasks. Psychological disturbances are also very common. The symptoms of obesity may resemble other conditions or medical problems. So in order to have a prosperous new generation we have to think about ways and means to formulate a balance life style and diet pattern for our adolescent population.

The prevalence of overweight and obesity is increasing worldwide at an alarming rate. Both developed and developing countries are affected. Additionally, as the problem appears to be increasing rapidly in children as well as in adults, the true health consequences may only become fully apparent in the future.

The primary environmental determinants of obesity are high calorie intake and low level of physical activity. Increased consumption of food prepared away from home has paralleled the rise in prevalence. Socio-economic status and place of residence are important contributors. These factors together comprise aobesogenic or toxic environment where the development of obesity is

the expected course for human leading lifestyles incompatible with their evolutionary development.[7]

Overweight and obesity are rising so rapidly in many countries that WHO has recognized as a global epidemic, the cause of the epidemic are not yet clear and more research is needed to establish grounds for prevention. In addition to the economic, social and cultural factors that influence the distribution of BMI in a population are also not well understood.[8] Among children of school age, total energy intake is positively associated with soft drink consumption.[9] A Study conducted in Dhaka city showed that 13% of children aged 2-10 years were obese were obese using the criteria of weight for height >120 as cut-off point. The study also revealed that obesity is positively correlated with the increase of family income.[10]

There are several health consequences of overweight and obesity in adolescents which includes psychological problems, increased cardiovascular disease risk factors, abnormal glucose metabolism, hepatic and gastro-intestinal disturbances, apnoea and orthopedic complications [11]. Since overweight and obesity is becoming a burden for the community the aim of this study will focus to find out proportion of adolescents school students in Dhaka city and fast food consumption and pattern of physical activity among them.

Materials and methods

This descriptive cross-sectional study was conducted from July 2019 to November 2019 among purposively selected 201 students of class VI to X of Bangladesh International School (BIS) Mohakhali, Dhaka. Data were collected through face to face interview using pre-tested structured questionnaire. Confidentiality was duly ensured to all participants and informed consent was obtained. Institutional permission from the appropriate authority was obtained before starting the study.Data were checked for quality control and analyzed by computer by using SPSS software version 23 and expressed in frequency and percentage.

Results

Mean age of the students was 13.42 ± 0.38 years. Out of 201 respondents 45 from class VI, 41 from class VII, 39 from class VIII, 36 from class IX and

40 students from class X. The highest 20.9% respondents are from 14 years age. Majority (51.2%) respondents were female and rest (48.8%) were Male. Muslims were 96.0%. Father of respondents, majority 65.2% were qualified in graduation and above, Mother of the respondents, majority 39.8% were qualified in HSC level of education. Occupation of majority father of respondent (51.2%) was Business and majority mother of respondent (79.1%) was housewife. Majority (49.3%) respondents had their monthly family income between Tk 20001-40000. Maximum (83.1%) respondents were living in Pacca house. Regarding obesity status of parents, 19.4% father was obese and 29.4% mother was obese. Maximum (69.2%) respondents had habit of taking snacks 2-3 times weekly and taking soft drinks 3-4 cans weekly. Among all respondents 64.2% were conscious about their diet, 61.2% were practicing outdoor games or physical activity 1 hour weekly, 71.1% respondents used to taking daily calorie between 1801-2100 Kcal (Table-II). Mean height of the respondent was 1.59 meter, mean weight 58.57 kg and mean BMI was 22.05. According to WHO cut-off point for overweight (BMI>24.99) in adolescents and adults the overall proportion of overweight among the respondents was found to be 18.4%. Association between overweight and age, sex, class, Occupation of mothers of respondent, monthly family income, frequency of snacks and daily calorie intake and duration of outdoor games or physical activity were found significant. But association with the overweight and occupation of father of respondents found not significant.

Table I Socio-demographic characteristics of respondents

Characteristics		Frequency	Percentage (%)
Class	Class-VI	45	22.4
	Class-VII	41	20.4
	Class-VIII	39	19.4
	Class-IX	36	17.9
	Class-X	40	19.9
	Total	201	100.0
Age (In years)	10	12	6.0
	11	18	9.0
	12	33	16.4
	13	36	17.9
	14	42	20.9
	15	33	16.4
	16	27	13.4
	Total	201	100.0

Characteristics		Frequency	Percentage (%)
	Mean ± SD = 13.42 ± 0.38		
Sex	Male	98	48.8
	Female	103	51.2
Religion	Muslim	193	96.0
	Hinduism	08	04.0
Educational status (Father of respondents)	Up to class-X	10	05.0
	SSC	20	10.0
	HSC	40	20.0
	Graduation and above	131	65.2
Educational status (Mother of respondents)	Up to class-X	12	06.0
	SSC	31	15.4
	HSC	80	39.8
	Graduation and above	78	38.8
Occupational status (Father of respondents)	Business	103	51.2
	Service	58	28.9
	Others	40	19.9
Occupational status (Mother of respondents)	House wife	159	79.1
	Service	38	18.9
	Business	04	02.0
Monthly family income	<20000	07	03.4
	20001-40000	99	49.3
	>40000	95	47.3
House type	Semi-pacca	32	15.9
	Pacca	167	83.1
	Kaccha	02	01.0

Table II Distribution of respondents by associated factors

Associated factors		Frequency	Percentage (%)
Obesity status of Parents of respondents	Father obese	39	19.4
	Mother obese	59	29.4
	Both obese	14	07.0
	None	89	44.2
Habit of taking snacks weekly	2-3 times	139	69.2
	4-6 times	27	13.4
	Less often	35	17.4
Habit of taking soft drinks weekly	Up to 2 cans	07	03.5
	3-4 Cans	139	69.2
	>5 Cans	25	12.4
	Less often	30	14.9
Consciousness about diet	Conscious	129	64.2
	Not conscious	41	20.4
	Occasional	31	15.4
Duration of outdoor games daily	Up to 1 hour	123	61.2
	>1 hour	45	22.4
	Negligible	33	16.4
Daily calorie intake	Up to 1800 Kcal	20	10.0
	1801-2100	143	71.1
	>2100	38	18.9

Table III Anthropometric data of the respondents

Anthropometric data	Mean	SD	Range
Height in meter	1.59	0.081	1.37-1.80
Weight in Kg	58.57	54.00	37.0-94.0
BMI	22.05	21.27	16.23-35.60

Table IV Prevalence of overweight Adolescents

Indicator	Frequency	Percentage (%)
BMI for age>85th percentile	46	22.9
BMI>24.99	37	18.4
BMI>22.99	49	24.4

BMI <25 = Normal, BMI 25-<30 = Overweight, BMI 30≥ = Obese.

Table V Association between overweight and socio-demographic variables and concerned

Variables		Overweight		Total	Statistics
		Yes n(%)	No n(%)		
Age group	10-12	05 (2.5)	56 (27.9)	61 (30.3)	χ^2=5.68
	13-14	17 (8.5)	62 (30.8)	79 (39.3)	df=2
	15-16	15 (7.5)	46 (22.9)	61 (30.3)	p<0.05
Sex	Male	20 (10.0)	78 (38.8)	98 (48.8)	χ^2=0.49
	Female	17 (8.5)	86 (42.8)	103 (51.2)	df=1, p>0.05
Class	Class-VI	06 (3.0)	39 (19.4)	45 (22.4)	χ^2=23.47
	Class-VII	07 (3.5)	34 (16.9)	41 (20.4)	df=4
	Class-VIII	07 (3.5)	32 (15.9)	39 (19.4)	p<0.05
	Class-IX	08 (4.0)	28 (13.9)	36 (17.9)	
	Class-X	09 (4.5)	31 (15.4)	40 (19.9)	
Occupational status (Father of students)	Business	14 (7.0)	89 (44.3)	103 (51.2)	χ^2=3.37
	Service	13 (6.5)	45 (22.4)	58 (28.9)	df=2
	Others	10 (5.0)	30 (14.9)	40 (19.9)	p>0.05
Occupational status (Mother of respondents)	House wife	24 (11.9)	135 (67.2)	159 (79.1)	χ^2=5.64
	Service	12 (6.0)	26 (12.9)	38 (18.9)	df=2
	Business	01 (0.5)	03 (1.5)	04 (2.0)	p<0.05
Monthly family income	<20000	00 (0.0)	00 (7.0)	07 (3.5)	χ^2=5.53
	20001-40000	17 (08.5)	82 (40.8)	99 (49.3)	df=2
	>40000	20 (10.0)	75 (37.3)	95 (47.3)	p<0.05
Frequency of snacks intake weekly	2-3 times	23 (11.4)	116 (57.7)	139 (69.2)	χ^2=7.68
	4-6 times	10 (5.0)	17 (8.5)	27 (13.4)	df=2
	Less often	04 (2.0)	31 (15.4)	35 (17.4)	p<0.05
Daily total energy intake	Up to 2100 Kcal	13 (6.5)	150 (74.6)	163 (81.1)	χ^2= 62.40
	>2100 Kcal	24 (11.9)	14 (7.0)	38 (18.9)	df=1, p<0.05
Duration of outdoor sports or physical activity	Up to 1 hour	35 (17.4)	121 (60.2)	156 (77.6)	χ^2=7.51
	>1 hours	02 (1.0)	43 (21.4)	45 (22.4)	df=1, p<0.05

Discussion

In this study it was revealed that male respondents were more overweight than the female respondents and 18.4% of overweight adolescents engaged themselves in the unhealthy practice of dieting. Parental encouragement of dieting of their overweight children may be an equally important factor. Skipping of breakfast observed amongst the overweight adolescents as part of diet control which is not a healthy practice. The respondents are habituated to pass relatively longer time in front of computer, television, Using mobile phone and gossiping with friends. These habits are being increasing day by day due to lack of playground, social insecurity and increased pressure of study.

In this study it was depicted that 68.2% of fathers and 38.8% of mothers of the respondents were qualified in graduate and above level of education. Therefore, this study was representing only the population with similar socio-economic status.

In this study family environment including type of accommodation and genetic predisposition relating to overweight were tried to relate. Regarding accommodation no such relation was observed as almost all of them were living in same category pacca house.

Occupation of the father of respondent was related to the prevalence of overweight. Children of businessmen had the highest prevalence as 7.0%, followed by children of service holder 6.5%. Mothers' occupation seemed to have association with prevalence of developing overweight. Large number of mother was housewife. Highest prevalence (11.9%) of overweight was found among the children of house wife mother. The prevalence of overweight among children of serving mother was 6.0%.

A definite relation was observed between income and prevalence of overweight. From the highest income group of this study highest percentage of students was found over weight (10.0%), the second highest group was 08.5%.

Over weight was classified by BMI equal to or more than 25.00. In this study, the prevalence of overweight among adolescents was found to be 18.4% according to BMI 25.00 and above. While considering cut-off point of overweight as 85th percentile, the prevalence of overweight was found to be 22.2%.[12] In a study on 202 adolescent school boys from one school in Dhaka showed the prevalence of overweight to be 16%.[13] Another study conducted by Hossain F, where it was shown that prevalence of overweight to be 16.8%.[14]

A cross-sectional study in 1999 on school children aged from 8-12 years in school of Kentucky USA

was carried out to find the prevalence of over weight on the basis of their food consumption and activity pattern based.[7] The study revealed 37% of the boys and 10.3% of the girls were found to be overweight.

In this study it was depicted that there was an association between taking more calorie containing food and being overweight. It was found that an adolescent who is taking more food than his or her calorie requirement he or she is becoming overweight. It was revealed that 11.9% of those were found overweight those who took more than 2100 Kcal in a day. On the other hand only 6.5% of those were found to be overweight, who took equal or less than 1800 Kcal per day.

Among the respondents those who took snacks items which include burger, hot dog, pizza, sand witch, French fry, chicken fry etc. around 2-3 times in a week; prevalence of overweight among them was 11.4%.The fast food habit also depended on the availability and accessibility to these foods in their environment, especially in the school and at home, which is similar to the study conducted by Dr Ahmed SMM where he found that 92.3% of the respondents were habituated with fast food.[15] Overweight has become a major public health challenge in developing countries due to the changes in the lifestyle and food habits of children owing to the influence of Urban culture and technological growth.[16]

Association between overweight and age, sex, class, Occupation of mothers of respondent, monthly family income, frequency of snacks and daily calorie intake, and duration of outdoor games or physical activity were found significant. But association with the overweight and occupation of father of respondents found not significant.

Limitation
For more vital and precise information larger sample size could have taken. The study population restricted for class VI to Class X students of Bangladesh International School, Mohakhali. They truly did not represent the total population of the country.

Conclusion
In this study the prevalence of overweight among the adolescents of the selected school is 18.4%. Boys were more overweight than girls. Higher percentage of overweight was found among the children of affluent families. Children, who took more calorie in daily diet and habituated with taking more fast food the prevalence of overweight was more in them. Awareness among the adolescent should be generated to develop healthy eating behavior, avoiding too much fast food and practicing regular physical activities.

Recommendation
Public Health program are indispensible to increase awareness on the risk factors among children and adolescent in order to reduce the future burden of obesity associated chronic disease. Article on obesity and its size effects should be included in text books for increasing awareness among the children. Parents should be warned and enlightened about the obesity and overweight phenomenon. So that, they can take care of their children in better way.

Contribution of author
Whole the study conducted by the author himself only.

Disclosure
The author declared no competing interests.

References
1.World Health Organization. Obesity: Preventing and managing the global epidemic: Report of a WHO Consultation, WHO Technical series 894, World Health Organization. Geneva. 2000;18.

2. Troiano RP, Flegal KM. Overweight prevalence among youth in the United States: Why so many different members? Int J ObesRelatMetabDisord. 1999; 23 (Suppl.2): 22-27.

3. Troiano RP, Flegal KM, Kuczarski RJ, Campbell SM, Johnson CL, Overweight prevalence and trends for children and adolescents: The national Health and nutrition Examination Surveys, 1963 to 1991. A research on pediatrics and adolescence medicine. 1995;149:1085-1091.

4. Kaur H, Hyder ML, Poston WS. Childhood overweight: An expanding problem.Treat Endocrinol. 2003;2(6):375-388.

5. Kimm SYS, Obarzanek E, Barton BA et al. Race, socio-economic status, and obesity in 9-10 years old girls: The NHLBI growth and health study. Ann Epideimiol. 1996;6:266-275.

6. Prentice AM Jebb SA. Obesity in Britain: gluttony or sloth? British medical journal. 1995;311:437-439.

7. Poston WS,Foreyt JP. Obesity is an environment issue, Atheroslerosis. 1999;146(2):201-209.

8. Morton JF, Guthrie JF. Changes in children's total fat intakes and their food group sources of fat, 1989-91 versus 1994-95: Implications for diet quality, Farm Econ Nutr Rev. 1998;11:44-57.

9. Harnack L, Stang J, Story M. Soft drink consumption among US children and adolescents: Nutritional consequences, Forum of Am Diet Assoc. 1999; 99:436-441.

10. VedavatiSubramanyam, Jayashree R, Rafi M. Prevalence of Overweight and Obesity in Affluent Adolescent Girls in Chennai in 1981 and 1998. Indian Pediatrics. 2003;40:332-336.

11. Dr.TingA.Overweight and lifestyle of adolescent school boys in Dhaka city. National Institute of Preventive and Social Medicine. Dhaka. 2003;57.

12. World Health Organization. Obesity: Preventive and managing the global epidemic: Report of a WHO consultation, WHO Technical Series 894, WHO;Geneva: 2000.

13. Rippe JM, Crossiey S Ringer R. Obesity as a chronic disease: Modern medical and lifestyle management, journ Am Diet Assoc. 1998; 98 (10): 9-15.

14. Hossain F. Overweight adolescents of an English medium school of Dhaka city and their fast food consumption pattern, National Institute of Preventive and Social Medicine. Dhaka. 2008;37.

15. DrAhmed SMM. Risk factors of child obesity in context of affluent society of Bangladesh. National Institute of Preventive and Social Medicine. Dhaka. 2005;103.

16. ThomasUsha M, D Narayanappa, MS Sujatha.Prevalence of overweight and obesity among school children in Mysuru, Karnataka. Journal of Family Medicine and primary Care. 2021;10(8):788-2792. Doi: 10.4103/jfmpc_2334_20.