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Original Article

Overweight and Obesity among School-going Adolescents in a Private School in Sylhet City

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Abstract:

Introduction: For both industrialised and developing nations, obesity and overweight are serious public health issues. It is responsible for both physical and mental health problems among adolescents.

Objective: The study was aimed at assessing the prevalence of overweight and obesity among school going adolescents.

Methods: This was a cross-sectional study carried out among the students of Blue Bird School and College in Sylhet, Bangladesh, between the periods of January 2017 and December 2017.

Results: A total of 158 students from classes 9 and 10 were included in the study by a purposive sampling method. The mean age of the students was 15.38 ± 0.754. Among them, 52.5% were male and 47.5% were female. Graduate or higher education was held by 48.1% of the respondents' mothers and 65.8% of the respondents' fathers. Most of the respondents' mothers (75.9%) were housewives, whereas most of the fathers (60.7%) were service holders. Among the respondents, 17.7% and 13.9% were overweight and obese, respectively. There was no significant relationship between body mass index and socio-demographic factors like gender, religion, educational qualification and occupation of the parents, family income, and family type. Most of the overweight (89.3%) and obese (95.5%) respondents performed physical exercise regularly, which was statistically significant ($p = 0.01$). Other lifestyle factors such as sports participation, food preferences, television viewing, and computer use were not found to be significantly linked to being overweight or obese.

Conclusion: In our study, adolescents had a greater prevalence of overweight and obesity. Public health programs are required to increase knowledge of the risk factors for overweight and obesity among children and adolescents in order to lessen the future burden of obesity-related chronic diseases.

Keywords: Overweight, Obesity, Adolescent, Body mass index

Introduction:

Obesity is a well-recognized global public health issue, and both industrialised and developing nations are seeing an increase in the incidence of the condition.

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Although the prevalence of overweight and obesity varies between different countries and ethnic groups, adolescent obesity is also one of the major health problems all over the world[1]. Obesity is linked not only to a higher chance of developing chronic conditions like diabetes mellitus, hypertension, dyslipidaemias, or cardiovascular disease[2], but also related to poor self-esteem, a low level of confidence in physical abilities, as well as a low interest in participating in physical activities[3].

The World Health Organization (WHO) defines obesity as a 'global epidemic'. An overweight adolescent has a 70% chance of becoming obese[4]. Once considered a problem only in high-income countries, overweight and obesity are now dramatically rising in low and middle-income countries like India, Nepal, Sri-Lanka, Bangladesh, etc., particularly in urban settings. More than 75% of overweight and obese children live in low and middle-income countries[5].

The prevalence of obesity in high income countries is very high, and many of them have declared obesity an epidemic. Like high-income countries, low-income countries are showing the same trend of increasing rates of obesity. And dual-burden households are very common where underweight and overweight coexist among the children[6].

Children in low- and middle-income nations are exposed to diets that are heavy in fat, sugar, salt, and calories, but low in micronutrients. These foods are typically less expensive but also lower in nutritional value. The sedentary nature of many jobs, new transportation options, and growing urbanisation all contributed to an increase in physical inactivity, which in turn led to a substantial rise in childhood obesity[4]. According to the Bangladesh Health and Demographic Survey 2014, 33% of the children in the country were underweight[7]. Yet, a recent nationwide epidemiological research found that 3.5% of children aged 6 to 15 were obese, 9.5% were overweight, and 17.6% were underweight[6]. These studies clearly underscore the fact that even in a resource-poor setting such as Bangladesh, where under-nutrition is a current problem, combating overweight and obesity could soon emerge as a major public health challenge[8]. The frequency of overweight and obesity has increased at least five times in Dhaka city during the past 20 years and it was much higher among those with better socioeconomic status[9]. So the aim of this study was to find out the prevalence of overweight and obesity among school-going adolescents and to assess the relationship between overweight, obesity and lifestyle.

Methods:
Between the periods of January 2017 and December 2017, this cross-sectional study was carried out among the students of Blue Bird School and College, a private school and college located in Sylhet City, Bangladesh. The school consisted of three sections: primary, secondary and college sections. The secondary section of the school consisted of classes 6-10 and accommodated nearly 2000 students. Data was collected from classes 9 and 10. A total of 158 respondents were included in the study by the purposive sampling method. The ethical clearance for the study protocol was taken from the institutional Ethical Committee of the National Institute for Preventive and Social Medicine (NIPSOM), Dhaka. Before conducting the study, permission was obtained from the school principal, and assent was taken from each participant. Data was collected through face-to-face interview using a semi-structured questionnaire. The data included socio-demographic characteristics like gender, religion, educational attainment and employment of parents, family income and type of family, and lifestyle choices made by the students, such as physical activity, the sports they prefer to play, the foods they prefer to eat, watching television, and computer use. Body weight was recorded to the nearest 0.1kg with subjects barefoot and wearing a school uniform and height was measured to the nearest 0.1cm by using a digital stadiometer. During the measurement of height, all the respondents were asked to stand with their backs to the scale wall and look directly forward. The back of their feet, calves, bottom, upper back, and the back of their heads should all be in contact with the scale wall. After height and weight measurements, BMI was calculated as "weight in kilograms divided by the square of height in meters (kg/m^2)". After calculating BMI, each BMI score was put into the CDC recommended growth chart (BMI for age), and then, manually, one by one, all BMI scores were converted into BMI percentile. BMI above the 85th to 95th percentile of the reference population was classified as overweight, above the 95th percentile as obese, below the 3rd percentile as underweight, and the 3rd to 85th percentile as normal weight. The data was analysed using SPSS version 20. Data was presented in the form of frequency, percentages, and bar graphs. The Chi-square was done with a probability of <0.05 considered statistically significant.

Result:
A total of 158 adolescents were included in the study. Among them, 52.5% were male and 47.5% were female. Most of the study subjects belonged to 15 and 16 years of age (42.4% and 41.1%, respectively). The mean age was 15.38 ± 0.754 years. The majority (67.1%) of the adolescents were Muslims, followed by Sanatan

with 32.3%. Among the study population, 65.8% and 48.1% of the fathers and mothers of the students got higher education, respectively (graduate and above). Regarding the occupation of the parents, 60.8% and 24.1% of the father and mother of the subject were service holders. The monthly income of most families (67.7%) was >40000 taka and 71% of the respondents came from nuclear families. There was no significant relationship between socio-demographic characteristics and the BMI of the respondents [Table I].

In the current study, 17.7% and 13.9% of adolescents were overweight and obese, respectively [Table II].

Regarding the lifestyle of the respondents, most of the overweight and obese respondents performed physical exercise regularly, which was 89.3% and 95.5%, respectively, and 61.5% and 71.6% among underweight and normal-weight students, respectively. The difference was statistically significant (p= 0.01). The majority of overweight and obese subjects preferred outdoor sports (78.6% and 68.2%, respectively), fast food (78.6% and 77.3%, respectively) and watching TV (71.4% and 59.1%, respectively). Most of the overweight (57.1%) and 45.5% of the obese respondents were habituated to using computers for a long time. The results were not statistically significant (p >0.05) in relation to underweight and normal-weight respondents [Table II].
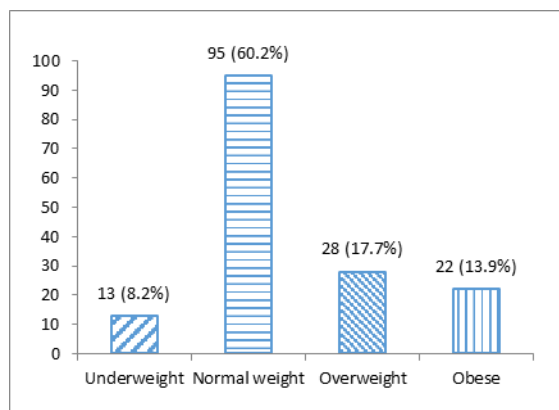

Figure 1: Distribution of the respondents according to body mass index (N=158)

Table 1: Association of socio-demographic characteristics and BMI of the respondents (N=158)

Characteristics	Underweight n(%)	Normal n(%)	Overweight n(%)	Obese n(%)	Total N (%)	p-value
Sex of the respondents						
Male	6 (46.2)	46 (48.4)	17 (60.7)	14 (63.6)	83 (52.5)	0.44
Female	7 (53.8)	49 (51.6)	11 (39.3)	8 (36.4)	75 (47.5)	
Religion						
Muslim	11 (84.6)	67 (70.5)	16 (57.1)	12 (54.5)	106 (67.1)	0.41
Sanatan	2 (15.4)	27 (28.4)	12 (42.9)	10 (45.5)	51 (32.3)	
Buddhist	0 (0.0)	1 (1.1)	0 (0.0)	0 (0.0)	1 (0.6)	
Education status of father						
HSC and below	7 (53.8)	35 (36.8)	7 (25.0)	5 (22.7)	54 (34.2)	0.29
Graduate and above	6 (46.2)	60 (63.2)	21 (75.0)	17 (77.3)	104 (65.8)	
Education status of mother						
HSC and below	12 (92.3)	84 (88.4)	20 (71.4)	16 (72.7)	82 (51.9)	0.06
Graduate and above	1 (7.7)	11 (11.6)	8 (28.6)	6 (27.3)	76 (48.1)	
Occupation of fathers						
Service holder	7 (53.8)	56 (58.9)	17 (60.7)	16 (72.7)	96 (60.8)	0.32
Businessman	6 (46.2)	39 (41.1)	11 (39.3)	6 (27.3)	62 (39.2)	
Occupation of mothers						
Service holder	1 (7.7)	25 (26.3)	6 (21.4)	6 (27.3)	38 (24.1)	0.49
Housewife	12 (92.3)	70 (73.7)	22 (78.6)	16 (72.7)	120 (75.9)	
Monthly family income						
≤40000	6 (46.2)	27 (28.4)	9 (32.1)	9 (40.9)	51 (32.3)	0.46
>40000	7 (53.8)	68 (71.6)	19 (67.9)	13 (59.1)	107 (67.7)	
Types of family						
Joint	4 (30.8)	24 (25.3)	11 (39.3)	7 (31.8)	46 (29)	0.53
Nuclear	9 (69.2)	71 (74.7)	17 (60.7)	15 (68.2)	112 (71)	

Table 2: Relationship of BMI and life styles (N=158)

Factors		Under weight n(%)	Normal n(%)	Overweight n(%)	Obese n(%)	Total N (%)	p-value
Physical Exercise	Yes	8 (61.5)	68 (71.6)	25 (89.3)	21 (95.5)	122 (77.2)	0.01
	No	5 (38.5)	27 (28.4)	3 (10.7)	1 (4.5)	36 (22.8)	
Types of sports prefer to play	Outdoor	8 (61.5)	70 (73.7)	22 (78.6)	15 (68.2)	115 (72.8)	0.66
	Indoor	5 (38.5)	25 (26.3)	6 (21.4)	7 (31.8)	43 (27.2)	
Types of food prefer to eat	Home made food	0 (0.0)	29 (30.5)	6 (21.4)	5 (22.7)	40 (25.3)	0.10
	Fast food	13 (100.0)	66 (69.5)	22 (78.6)	17 (77.3)	118 (74.7)	
Watching TV	Yes	9 (69.2)	76 (80.0)	20 (71.4)	13 (59.1)	118 (74.7)	0.20
	No	4 (30.8)	19 (20.0)	8 (28.6)	9 (40.9)	40 (25.3)	
Working at computer	Yes	4 (30.8)	54 (56.8)	16 (57.1)	10 (45.5)	84 (53.2)	0.28
	No	9 (69.2)	41 (43.2)	12 (42.9)	12 (54.5)	74 (46.8)	

Discussion:

This descriptive cross-sectional study was conducted among 158 adolescents of both sexes between the ages of 14 and 17 years at a selected urban school in Sylhet City. The mean age was 15.38 ± 0.754 years. The maximum numbered respondents were male (52.5%) and female were 47.5%. Muslim respondents made up the majority (67.1%) and more than two thirds (71%) resided in nuclear families. In their study of Nigerian adolescents, Yusuf et al. discovered that 57% were girls and 43% were boys, which is opposite to our study[10].

The majority of the fathers of overweight and obese respondents had graduate or postgraduate degrees (75.0% and 77.3%, respectively) and were service holders (72.7% and 60.8%, respectively). Most of the mothers of overweight and obese students were undergraduates (71.4% and 72.7%, respectively) and housewives (78.6% and 72.7%, respectively). In a cohort study across 11 European country, Ruiz et al. found that the lower educational status of mothers yielded a substantial risk factor of overweight and obesity in children, which supports our results[11]. The opposite result was found in two studies conducted among urban

schoolchildren and adolescents in Dhaka, Bangladesh, where mothers of overweight and obese children were more educated than mothers of healthy children[1,12]. This contrasting result may be related to the socioeconomic status of the respondents. In our study, the BMI of the respondents did not significantly correlate with the parents' occupation or educational background.

Most respondents (67.7%) had a monthly family income of >40,000 taka. A study done by Gurung et al. found that overweight and obesity were 2.71 times higher among adolescents whose parents' monthly income was more than 10,000 rupees as compared to less than 10,000 rupees[5]. In the present study, family income was not significantly related to BMI.

In our study, 17.7% of the respondents were overweight, and 13.9% were obese. According to a nationwide epidemiological survey conducted by Bulbul et al., urban school pupils in Bangladesh had a prevalence of overweight and obesity of 10.6% and 5.6%, respectively, which is less than our study result[6]. Another study done by Mohsin et al. found that the prevalence of obesity was 17.9% among affluent schoolchildren in Dhaka, which is similar to our study[13].

According to a study by Bhuiyan et al. among urban school-aged children in Bangladesh, those who did not engage in physical activity were more likely to be overweight or obese[12]. Our study results are opposite to previous studies, where the majority of overweight and obese adolescents performed physical exercise (89.3% and 95.5%, respectively), though the result was not statistically significant. This may be due to the inclusion of physical activity at school as physical exercise.

Most of the overweight and obese respondents preferred to play outdoor games (78.6% and 68.2%, respectively). According to a research by Bhargava et al., lack of physical activities among teenagers was significantly associated with overweight and obesity[14]. This result is dissimilar to our study.

In our study, the majority of overweight and obese adolescents preferred to eat fast foods (78.6% and 77.3%, respectively). In a study Goon et al. found that student who consumed fast food two or more times per week were more

likely to be obese[15]. This finding supports our study.

In the current study, most of the overweight and obese respondents were used to passing their leisure time by watching TV (71.4% and 59.1%, respectively), and 57.1% of overweight and 45.5% of obese respondents spent time on the computer. In a study, Al-Ghamdi SH found that people who watched more than three hours of television each day had a far higher likelihood of becoming overweight than people who watched less than three hours each day[16].

Conclusion

Obesity and being overweight are substantial public health concerns in Bangladesh. In our study, a large percentage of school-aged adolescents were overweight or obese. There is an urgent need to implement strategies for the prevention and control of overweight and obesity among school-going adolescents.

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