



Original Article

Influence of Body Mass Index on Self-esteem among School Adolescents

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ABSTRACT

The prevalence of obesity is increasing in both developed and developing country. Overweight or obesity in adolescent is related to a poor body figure perception, low self-esteem, and a low level of confidence in physical abilities. The objective of the study was to find out the influence of body mass index (BMI) on self-esteem among adolescents and also find out the relationship between BMI, self esteem and socio-demographic characteristics of the respondents. This cross-sectional study was conducted among the students of Blue Bird School and College, a private school and college situated in Sylhet City, Bangladesh. Data was collected from students of class 9 and 10 and total of 158 students were included in the study. Data was collected by face to-face interview using a semi-structured questionnaire by author himself. After height and weight measurement, BMI was calculated as 'weight in kilogram divided by the square of height in meter (Kg/m²)'. Self-esteem was measured by using the Rosenberg Self-esteem Scale. Among 158 respondents, 52.5% were male and female were 47.5%. The mean age was 15.38 ± .754 years. Overweight and obesity were present in 31.6% of the respondents. Overweight and obesity was higher among the respondents whose mothers had a higher academic degree, which was statistically significant. According to the Rosenberg self-esteem scale, low self-esteem and normal self-esteem were present in 80.4% and 19.6% of the respondents, respectively. There was no significant relationship between self-esteem with socio-demographic data, but there was a statistically non-significant positive correlation between self-esteem and BMI on the Pearson Correlation test. Over-weight and obesity were found higher among the adolescents in this study. The proportion of self-esteem scores was low among the adolescents and self-esteem was positively related to high BMI.

Keywords: Obesity, Body mass index, Self-esteem, Adolescent

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INTRODUCTION

Adolescence is a crucial period in human development during which significant somatic growth and the maturation of secondary sexual characteristics take place¹. This period is not only a time of dynamic

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physical change, but of psychological, behavioral and emotional development. Despite the fact that this is the period of greatest fast growth, second only to infancy, nutritional problems in adolescents have been generally disregarded in underdeveloped nations, both as a subject of scientific inquiry and as a focus of public health and nutrition programs².

It is a well-recognized fact that obesity is a major public health problem in the world, and the prevalence of obesity is increasing in both developed and developing countries. Although the prevalence of overweight and

obesity varies by country and ethnic group, adolescent obesity is one of the world's major health problems³. Obesity is not only related to increased risk of chronic diseases such as diabetes mellitus, hypertension, dyslipidemia or cardiovascular disease⁴, 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 activities⁵.

The World Health Organization (WHO) has declared obesity a "global epidemic". According to WHO projections for 2015, nearly 1.5 billion individuals will be overweight. Adolescents who are overweight have a 70% chance of becoming obese⁶. Overweight and obesity, once thought to be a problem only in high-income countries, are now dramatically increasing in low and middle-income countries such as India, Nepal, Sri Lanka, and Bangladesh, particularly in urban areas⁷.

Obesity is extremely common in high-income countries, and many have declared obesity an epidemic⁸. Children in low- and middle-income nations are exposed to high-fat, high-sugar, high-salt, energy-dense, and micronutrient-poor diets, which are less expensive but have worse nutritional content. Simultaneously, rising levels of physical inactivity have resulted in substantial rises in childhood obesity, owing to the increasingly sedentary character of many types of labour, changing modes of transportation, and increased urbanization⁶. According to the Bangladesh Health and Demographic Survey, one-third (33%) of the children in the country were underweight⁹. However, a recent countrywide epidemiological study reported that among 6-15-year-old children, 3.5% were obese, 9.5% were overweight and 17.6% were underweight⁸. Overweight and obesity have increased at least fivefold in Dhaka over the last two decades, with the prevalence being significantly higher among individuals with better socioeconomic status¹⁰.

Self-esteem appears to be a key component in predicting depressive symptoms in young adults. According to some authors, overweight or obesity in young adults is related to a poor body image perception, low self-esteem, and a lack of confidence in physical abilities as well as a low interest in participating in physical activities¹¹.

Previous studies into the relationship between BMI and self-esteem failed to achieve a consensus on the existence of a negative relationship. Thus, Mendelson investigated the relationship between obesity and self-esteem and demonstrated a lack of association between

bodyweight and self-esteem. In contrast to Mendelson, Webber asserts that body mass is an important aspect of social acceptance and that being overweight is a significant predictor of low self-esteem. Pilafova and Bledsoe have demonstrated a negative association between body mass and self-esteem¹².

So, the aim of the study was to find out the influence of BMI on adolescent self-esteem and also finding out the relationship between these two variables with the respondents socio-demographic status.

METHODOLOGY

This cross-sectional study was conducted among the students of Blue Bird School and College, a private school and college situated in Sylhet City, Bangladesh, between the periods of January 2017 and December 2017. The school consisted of three sections named primary, secondary and college section. The secondary section of school consists of classes 6-10 and accommodates nearly 2000 students. Data was collected from classes 9 and 10. Among 800 students in these two classes, 158 respondents were included in the study by means of a purposive sampling method. The ethical clearance of the study protocol was taken from the institutional Ethics Committee of the National Institute of Preventive and Social Medicine, Dhaka. Before conducting the study, permission was obtained from the school's principal and ascent was obtained from each participant. Data was collected by face to face interview using a semi-structured questionnaire by the investigators. Body weight was recorded to the nearest 0.1kg with subjects barefoot and wearing 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 back to the scale wall and look directly forward. The back of their feet, calves, bottom, upper back and the back of their head should all be in contact with the scale wall. After height and weight measurement, BMI was calculated as 'weight in kilogram divided by the square of height in meter (Kg/m^2)'. After calculating BMI with the help of SPSS Version 20, each BMI score was put into the CDC recommended growth chart (BMI for age), then manually one by one all BMI score were converted into BMI percentile. Self-esteem was measured by using the Rosenberg Self-esteem Scale. All data were analyzed using SPSS version 20. Chi-square test was done with a probability of <0.05 considered as statistically significant. The Pearson Correlation test

was done to find out the relationship between self-esteem and BMI.

RESULT:

This descriptive cross sectional study was conducted among 158 adolescents of both sexes between the ages of 14-17 years in a selected urban school in Sylhet City. Among the respondents, 52.5% were male and female were 47.5%. The mean age was $15.38 \pm .754$ years. Overweight and obesity were present in 31.6% of the respondents.

There was no significant relationship between overweight and obesity with age and sex of the respondents, educational qualification of the father & occupation of the father and mother of the respondents, monthly family income and types of family. The prevalence of being overweight and obese was higher

among the respondents whose mothers were highly educated (Graduate and above), which was statistically significant ($p=0.01$) (Table-I).

According to the Rosenberg self-esteem scale, low self-esteem was present in 127 (80.4%) of the respondents and normal self-esteem was present in 31 (19.6%) of the respondents [Figure-1]. There was no significant relationship between self-esteem with age & sex of the respondents, educational qualification & occupation of the father and mother of the respondents, monthly family income and types of family (Table-II).

This study showed that there was a positive relationship between self-esteem and BMI on the Pearson Correlation test. However, this was statistically non-significant ($r=.029, p=.721$) (Figure-2).

Table-I: Association between socio-demographic status and BMI (n=158)

Characteristics	Normal weight, n(%)	Overweight & Obese, n(%)	p value
Sex of the respondents			
Male	52 (62.6)	31 (37.4)	0.14
Female	56 (74.7)	19 (25.3)	
Religion			
Muslim	78 (73.6)	28 (26.4)	0.06
Hindu and others	30 (57.7)	22 (42.3)	
Education status of father			
HSC and below	42 (77.8)	12 (22.2)	0.09
Graduate and above	66 (63.5)	38 (36.5)	
Education status of mother			
HSC and below	96 (72.7)	36 (27.3)	0.01
Graduate and above	12 (46.2)	14 (53.8)	
Occupation of fathers			
Service holder	63 (65.6)	33 (34.4)	0.45
Businessman	45 (72.6)	17 (27.4)	
Occupation of mothers			
Service holder	26 (68.4)	12 (31.6)	0.99
Housewife	82 (68.3)	38 (31.7)	
Monthly family income			
≤40000	33 (64.7)	18 (35.3)	0.61
>40000	75 (70.1)	32 (29.9)	
Types of family			
Joint	28 (60.9)	18 (39.1)	0.26
Nuclear	80 (71.4)	32 (28.6)	

*bdt- Bangladeshi Taka

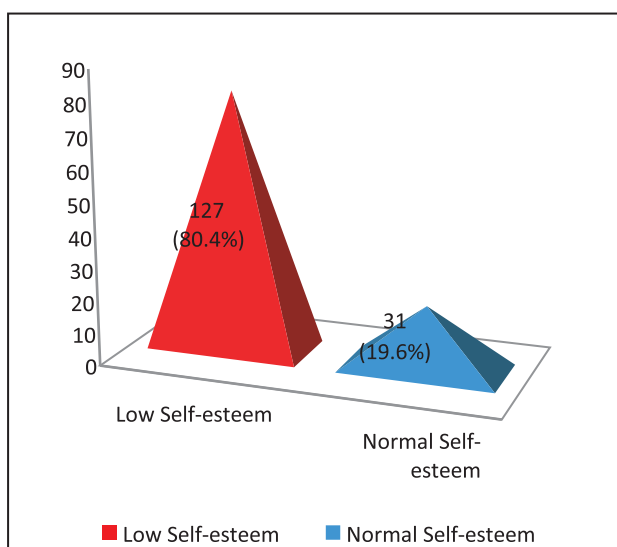


Figure-1: Distribution of the respondents according to Self-esteem score by Rosenberg self-esteem scale (n=158)

Table-II: Association between socio-demographic status and self-esteem (n=158)

Socio-demographic data		Low self-esteem, n (%)	Normal self-esteem, n (%)	p value
Sex	Male	70 (84.3)	13 (15.7)	0.18
	Female	57 (76.0)	18 (24.0)	
Religion	Islam	81 (76.4%)	25 (23.6%)	0.11
	Sanatan & others	46 (88.2%)	6 (11.8%)	
Educational qualification of father	HSC and below	44 (81.5)	10 (18.5)	0.96
	Graduate and above	83 (79.8)	21 (20.2)	
Educational qualification of mother	HSC and below	66 (80.5)	16 (19.5)	0.97
	Graduate and above	61 (80.3)	15 (19.7)	
Occupation of Father	Service holder	77 (80.2)	19 (19.8)	0.94
	Businessman	50 (80.6)	12 (19.4)	
Occupation of mother	Service holder	32 (84.2)	6 (15.8)	0.65
	Housewife	95 (79.2)	25 (20.8)	
Family income (*bdt/month)	<40000	41 (80.4)	10 (19.6)	0.99
	>40000	86 (80.3)	21 (19.7)	
Types of family	Joint	40 (87.0)	6 (13.0)	0.18
	Nuclear	87 (77.7)	25 (22.3)	

*bdt- Bangladeshi Taka

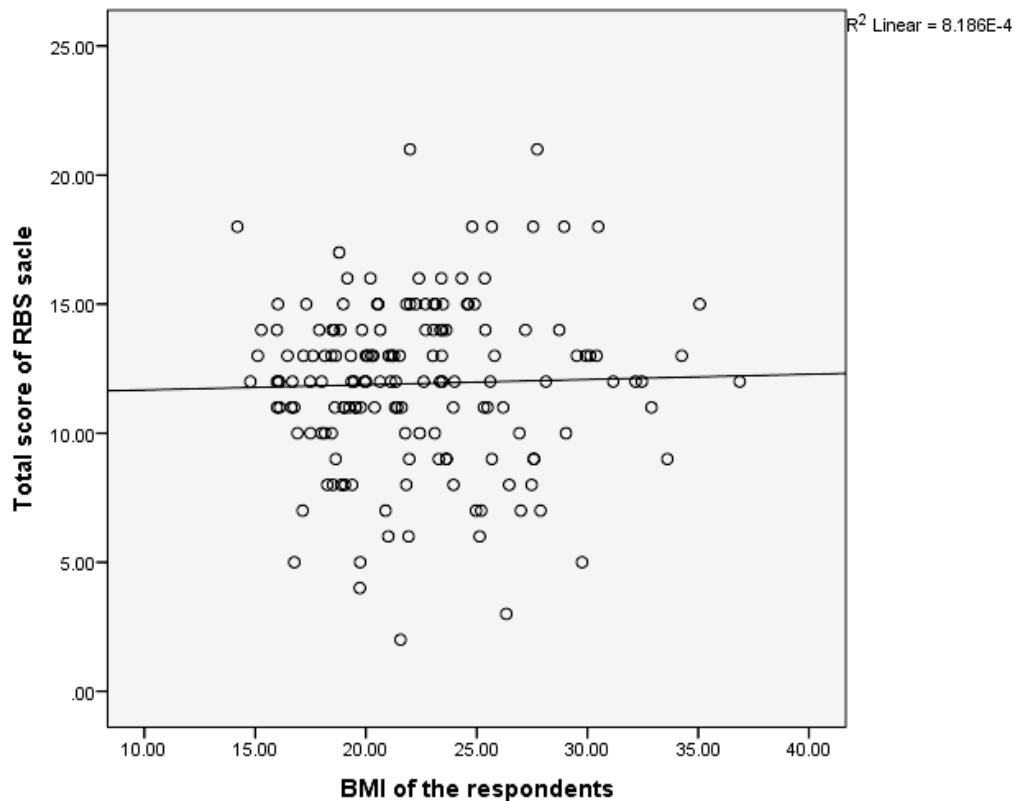


Figure-2: Pearson Correlation between total score of Rosenberg self-esteem scale and BMI ($n=158$, $r=.029$, $p=.721$)

DISCUSSION

This descriptive cross-sectional study was aimed to assess the relationship between body mass index and self-esteem and also finding out the relationship between these two variables with the respondents socio-demographic variables. This study was conducted among 158 adolescents of both sexes between the ages of 14-17 years in a selected urban school in Sylhet City. Among 158 respondents, more than half (54.4%) were in the age group of 14-15 years and 45.6% were in the age group of 16-17 years. The mean age of the respondents was 15.38 ± 0.754 years. Nearly similar results were found in two different studies done in Korea and Iran where the mean age of the study population was 16.39 ± 0.90 and 16.29 ± 0.78 respectively^{13,14}.

In this study, 52.5% respondents were male and females were 47.5%. A survey of Turkish adolescents revealed a similar picture, with boys accounting for 54.4% and girls for 45.6%¹⁵. In both studies, Sabeti et al. in Iran and Makinen et al. in Finland found that the ratio of boys to girls was slightly higher^{14,16}. Alvani et al. in Iran and Furnham et al. in England, on the other

hand, discovered a distinct sex ratio^{1,17}.

Overweight and obesity were present in 50 (31.6%) of the respondents. In 2014, a countrywide epidemiological study reported that among 6-15-year-old children, 3.5% were obese, 9.5% were overweight⁸. The outcome was lower than in our study. Another study done by Gurung et. al. among adolescent school students in Belgaum city, Nepal found that the prevalence of overweight and obesity was 15.3%, which is also dissimilar to our study⁷.

There was no significant relationship between overweight and obesity with age and sex of the respondents, educational qualification of the father & occupation of the parents of the respondents, monthly family income and types of family. But overweight and obese was higher among the respondents whose mothers were highly educated (Graduate and above), which was statistically significant ($p < 0.05$). This was in contrast to the findings of Alvani et al., who found no correlation between BMI and parental educational qualifications¹. In another study, Gurung et al. discovered that BMI was significantly higher in joint families⁷. Our study also revealed that BMI was higher

in joint families than in nuclear families, but this was not statistically significant.

According to the Rosenberg self-esteem scale, low self-esteem was present in 127 (80.4%) and normal self-esteem in 31 (19.6%) of the respondents. There was no significant relationship between self-esteem and age & sex of the respondents, educational qualification & occupation of the father and mother of the respondents, monthly family income, and types of family. Sabeti et al. found a significant correlation between self-esteem and parental educational qualification which is opposite to our study¹⁴.

This study showed that there was a positive correlation between self-esteem and BMI on the Pearson Correlation analysis which was statistically non-significant. Strauss RS did not find any significant change in self-esteem among the obese participants of the study¹⁸.

Overweight and obesity did have an impact on children's quality of life and self-esteem in the study, particularly in terms of psychosocial and emotional health¹⁹. In a study by Mendiratta P et al., they found that obesity was inversely related to self-esteem²⁰. Becerra MAO et al. and Habib F et al. showed Pearson correlation that there was a significant negative correlation between Body Mass Index (BMI) and total self-esteem^{11,21}. Similarly, Makinen M et al. and Sabeti et al. found that BMI and self-esteem were significantly associated in both of their studies^{16,14}. In England, Furnham et al. found that the correlations between the weight dissatisfaction measure and self-esteem showed no significant correlation for boys but a modest positive correlation for girls¹⁷. Hesketh et al. concluded their study by stating that there was an increasingly strong association between lower self-esteem and higher BMI²². In our study, we found a positive correlation between BMI and self-esteem, though it was not statistically significant. However, Kim O et al., Canpolat et al., and Strauss RS et al. found no significant association between BMI and self-esteem in three studies, which is similar to our findings^{13,15,18}.

CONCLUSIONS

Over-weight and obesity were higher among the adolescents in this study. The study reveals that self-esteem is not associated with respondents' body mass index, and socio-demographic characteristics. But self-esteem was found to be positively related to higher BMI without any statistical significance. The proportion of adolescents with low self-esteem scores

is higher in this study. This low self-esteem score will become a burden for the family and also for the nation.

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