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Overnutrition among the School Students in Dhaka City: A Cross-sectional Study

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ABSTRACT

Background: The study focuses on childhood obesity and its rise due to fast food and reduced physical activity. **Objective:** The aim of this study is to investigate the nutritional assessment, knowledge, attitude and practice of English medium School students aged 11-15 years in Dhaka city.
Methodology: This cross-sectional study was conducted among randomly selected 280 school students with anthropometric measurement and using a semi-structured questionnaire with the permission of the student's guardian/s.
Results: The overall prevalence of overweight/obesity in this study found 51.43% where 11.43% were obese and 40.0% were overweight. The students have eaten pizza, burger and pastry according to 20%, 28% and 15% respectively at their tiffin time. About 68% respondents have not played any outdoor games (only computer games regularly). 61% normal BMI students did physical activity regularly and 91% risk BMI respondents didn't physical activity regularly. The energy intake in last 24 hours of respondents according to their BMI also is statistically significant ($p<0.01$); the average energy intake of 49% male of normal BMI respondent was about 1576 kJ and the average energy intake of 48% female of normal BMI respondent was about 1455 kJ. On the other hand, the average energy intake of 51% male of risk BMI respondent was about 1819 kJ and the average energy intake of 52% female of risk BMI respondent was about 1707 kJ. **Conclusion:** Overweight/obesity is a public-health concern among English medium school students, especially in high-income group in Dhaka. From the key finding of the current study, awareness program regarding overweight or obesity along with prevention measures were particularly focus on the English medium school students from their school as well as their family.

Keywords: Obesity, Overweight, BMI, Energy Intake, Food consumption, Nutritional value.

INTRODUCTION

Childhood over-nutrition is a new epidemic worldwide. In recent years due to burgeoning fast-food industry in developed countries the problem of over-nutrition in children has emerged as a problem in high income society; More than 50% of children in USA and many Western European countries are found either overweight or obese.[1] The increasing prevalence of

overweight, obesity and its consequences prompted the World Health Organization to designate obesity as a global epidemic. World Health Organization's latest projections indicate that globally in 2005, approximately 1.6 billion adults were overweight and at least 400 million adults were obese. World Health Organization further projects that by 2015, approximately 2.3 billion adults will be overweight and more than 700 million will be obese.[2] Overweight and obesity is an escalating health problem in both developed and developing countries. The International Obesity Task Force report showed that 1 in 10 children worldwide is overweight; a total of 155 million children and adolescents are overweight and around 30–45 million are classified as obese.[3] Obesity is a chronic disorder that has multiple causes. Overweight and obesity in childhood have significant impact on both physical and psychological health. In addition, psychological disorders such as depression occur with increased frequency in obese children. Over-weight children are more likely to have cardiovascular and digestive diseases in adulthood as compared with those who are lean. It is believed that both over-consumption of calories and reduced physical activity are mainly involved in childhood obesity. However, face a greater risk of health problems including type 2 diabetes mellitus, high blood pressure, high blood lipids, asthma, sleep apnoea, orthopedic problems and psychosocial problems than their normal weight peers.[4] In the developing countries, obesity prevalence is increasing, according to the data collected by WHO from 94 countries the mean prevalence of obesity is 3.3%, in these countries. In African and Asian countries underweight is 2.5-3.5 times more prevalent than obesity. In several studies, prevalence of obesity is found 2-13% and underweight 10-37% among 12-17 yrs old children, in Turkey.[5] In studies with adults, abdominal obesity was found to be a risk factor for cardiovascular events and mortality. In adolescents, the accumulation of abdominal fat has been identified as a risk factor for the occurrence of cardiovascular and metabolic diseases. In addition, increased abdominal fat is associated with elevated blood pressure, higher triglyceride concentration, and hyper-insulinemia.[6] Overweight and obesity are caused by a complex array of genetic, metabolic, and behavioral interactions across a number of relevant social, environmental and policy contexts that influence eating and physical activity. Over the past three decades, increases in the proportion of meals eaten outside of the home, parental working hours, television and other media use, changes in marketing patterns and the school food environment have exacerbated the health effects of this historic shift in living conditions. Children are eating more meals away from home and those meals are often high in fat and low in fiber-rich carbohydrates such as fruits, vegetables and whole grains. It is easy for children to consume high fat, calorie-dense foods because many kids are provided with pocket money and have the freedom of choice in meals, especially breakfast and lunch. Though India is one of the countries that combating with the communicable diseases. On the other hand, has an admirable health status comparable to the West and is now going through an epidemiological transition where non-communicable diseases are more prevalent. The ‘nutritional transition’ and the lifestyle changes are also becoming relevant among the adolescents. The popularity of ‘fast foods’, food from outside, sedentary lifestyles, increased ‘pocket money’, lack of sports, and computer watching and working parents have all led to a chance in the way of life, the effects of which have to be studied [7].

METHODOLOGY

Obesity and obesogenecity are non-communicable conditions. Childhood obesity is multifactorial and ecogenetic and sum of influences of surroundings, and conditions promoting obesity in individuals

or population to overwhelm both developed and developing countries. A cross-sectional study was conducted three English medium schools at Dhanmondi area in Dhaka city. The practicing food intake and determining relevant association of obesity among the 280 students of sixth to eighth grade were taken by random sampling from the register of each class of each English medium school. For anthropometry, height and weight was measured by the standard weight machine (kg) [Tanita (HD-318), Tanita Corporation, Tokyo, Japan] and the height scale (cm). For collection of primary data about knowledge and practices of students, a semi-structured questionnaire developed based on the research objectives with the permission of the student's guardian/s. Data was collected by measuring anthropometry and a face-to-face interview of the students from a semi-structured pre-tested questionnaire, upon their guardians' consent and convenience.

RESULTS

The findings of the present cross-sectional study conducted among the students of English medium school at Dhanmondi area in Dhaka city through a semi-structured questionnaire with the permission of the student's guardian/s in order to assess the anthropometric measurement, knowledge, attitude and practice regarding the nutrition assessment are presented as follows:

Figure 1. Distribution of male (n=165) and female (n=115) respondents on the basis of education (n=280)

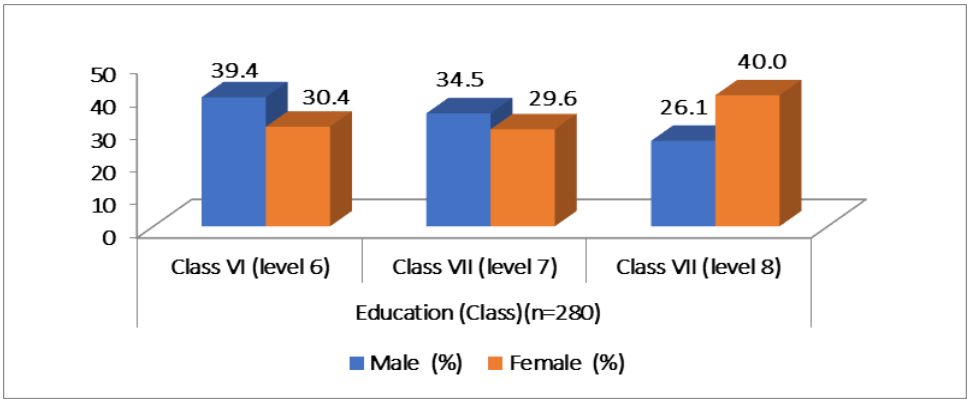

Figure 1 shows the sex distribution of the respondents among all the three classes. In the class VI, about 40% respondents were male among the total male respondents recruited in the present study and about 30% respondents were female among the total female respondents. Likewise, in the class VII, about 34% respondents were male among the total male respondents and about 30% respondents were female among the total female respondents while in the class VIII, about 26% respondents were male among the total male respondents and about 40% respondents were female among the total female respondents.

Figure 2 shows the BMI distribution among the male (n=165) and female (n=115) participants, the 49% male respondents were in normal condition where about 51% respondents were in risk condition among the total male respondents in the study. About 48% female respondents were in normal condition where about 52% respondents were in risk condition among the total female respondents in the study.

Figure 2. BMI distribution among male and female respondents (n =280)

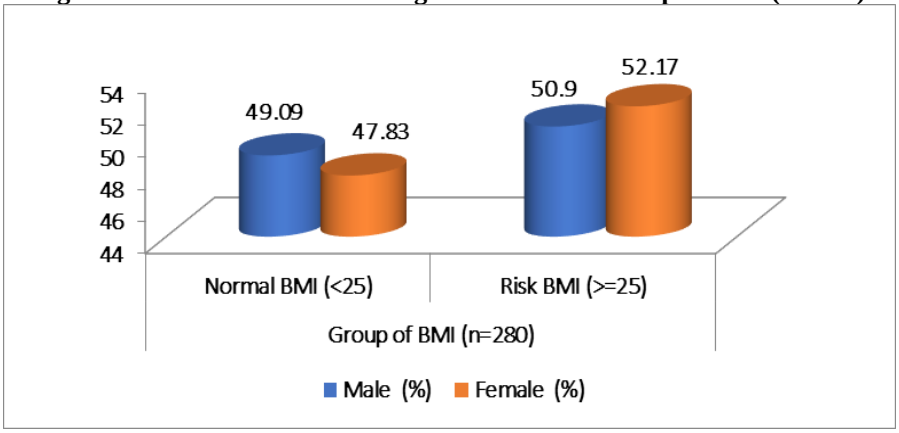

Table 1. Food intake at tiffin time and playing outdoor games in week practice status of the respondents (n = 280)

Status of attitude regarding the type of fast food (like to eat most)	Frequency (n)	Percentage (%)
Pizza	55	19.64
Burger	79	28.21
Chops (Kabab)	33	11.79
Roll	29	10.36
Hotdog	23	8.21
Pastry	41	14.64
Others	20	7.14
Playing Status of respondent's (Play most of the days in a week)	Frequency (n)	Percentage (%)
No Outdoor games (Computer)	190	67.86
Football	13	4.64
Cricket	29	10.36
Basket ball	22	7.86
Volley ball	5	1.79
Tennis	10	3.57
Others	11	3.92

Table-1 shows the percentage of most fast-food item eaten by the respondents at tiffin time; about 20% respondents has eaten pizza, 28% respondents has eaten burger, about 12% respondents has eaten chops (kabab), about 10% respondents has eaten roll, about 8% respondents has eaten hotdog, nearly 15% respondents has eaten pastry and rest of 7% respondents has eaten other items. On the other hand, the percentage of outdoor games mostly played in a week; about 68% respondents has not played any outdoor games (only computer games regularly), about 5% respondents has played football, about 10% respondents has played cricket, nearly 8% respondents have played basketball, around 2% has played volley ball, about 4% respondents has played tennis and rest of 13% respondents has played other games.

Table-2 shows the regular physical activity of respondents according to their BMI; about 61% normal BMI respondents did exercise regularly, and 39% normal BMI respondents didn't exercise regularly. On the other hand, only 9% risk BMI respondents did exercise regularly, and 91% risk BMI respondents didn't exercise regularly. The energy intake in last 24 hours of respondents according to their BMI is statistically significant ($p<0.01$); the average energy intake of 49% male of normal BMI respondent was about 1576 kJ and the average energy intake of 48% female of normal BMI respondent was about 1455 kJ. On the other hand, the average energy intake of 51% male of risk BMI respondent was about 1819 kJ and the average energy intake of 52% female of risk BMI respondent was about 1707 kJ.

Table 2. Regular physical activity and Mean energy intake of the respondents (n = 280)

Status of *R*egular physical *activity*	Normal BMI (<25) n (%)	Risk BMI (>=25) n (%)	p-value
Yes	83(61.0)	13(9.0)	<0.01
No	53(39.0)	131(91.0)	
	Normal BMI (<25)	Risk BMI (>=25)	
Mean energy intake	(% = 49; 48)	(% =51; 52)	
Male (n=165)	1576.80 ± 260.50	1819.42 ± 357.48	<0.01
Female (n=115)	1454.79 ± 210.47	1707.87 ± 395.60	

Figure 3. BMI distribution among the respondents (n=280)

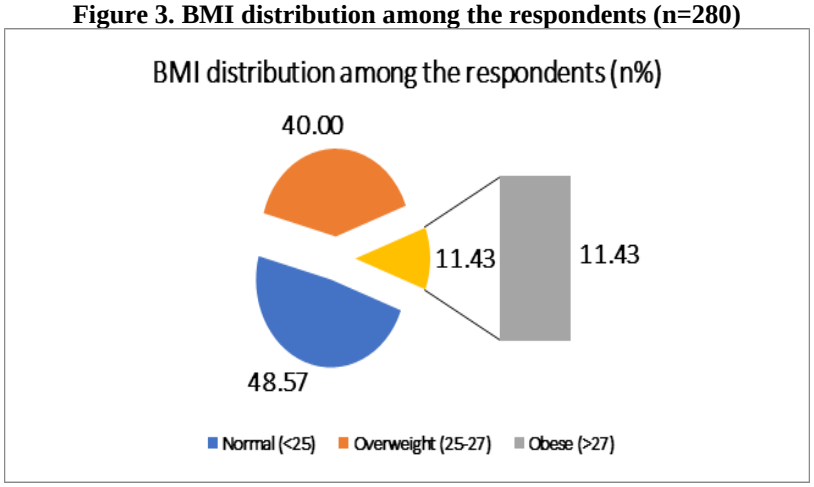

Figure 3 shows the percentage distribution of BMI among the respondents; where more than 11% were obese (BMI >27), 40% were overweight (BMI 25 to 27), and the rest of less than 49% were normal (BMI<25).

DISCUSSION

The present cross-sectional study conducted among the students at English medium school at Dhanmondi area in Dhaka city through a semi-structured questionnaire to assess the knowledge, attitude and practice regarding the status of obesity showed some burning public health concerns. The developed countries face a significant and rapidly growing childhood obesity epidemic. Children in lower- and middle-income countries are also at risk, especially those growing up in urban environments and able to afford a western lifestyle. In countries where childhood obesity has become an epidemic, population-based strategies should be emphasized.[8, 9] The prevalence of overweight and obesity decreases with higher socioeconomic status. In some developed countries the cost of food that is high in fat and sugar, especially fast food, is low in comparison with more traditional foods, and therefore affordable by people of low socioeconomic status. However, in Jordanian culture, fast-food restaurants are relatively expensive and eating there is affordable mainly by high socioeconomic status families.[10, 11]

In the current study, about 49% respondents were in normal condition depending on BMI where the more than 51% respondents were in risk condition depending on BMI, among them 51% male respondents were in risk condition among the total male respondents in the study and 52% respondents were in risk condition among the total female respondents in the study. The prevalence increases as the age increases. The prevalence peaked at 13, 14 and 15yrs. A school-based study in Chennai done in adolescents showed that the prevalence peaked at 10,13 and 15 years but whereas a study in Delhi showed that the maximum prevalence of obesity was at 10-12 years. Study subjects included were boys and girls, boys showed a higher prevalence of obesity than girls while girls showed higher prevalence of overweight than boys which is

similar to the findings of Delhi study. Similarly study conducted in Punjab also revealed that overweight was high among girls compared to boys whereas obesity was high among boys.[12] The difference in prevalence is seen with paternal/ maternal education as in a study at Wardha city, central India, there was positive significant association with food where the children may have more pocket money and may eat more from outside especially bakery items and junk foods.[13] Socioeconomic status may indirectly affect the development of overweight / obesity through the alteration of dietary habits /behaviors and physical activity patterns.[14]

A study on UK in 2004 showed that nutritional transmission was associated with increase in consumption of energy dense foods, sugar, sweet drinks and foods with low fiber along with low physical activity and sedentary lifestyle that had caused increase in weight gain and obesity in children. On the other hand, there was a relationship between nutritional behaviors and physical activity of children and adolescents with their perceptions from their parents' lifestyle.[15] Findings of the present study showed that junk food was consumed by majority of the respondents; about 20% respondents used to take pizza regularly, 28% respondents had been habituated of taking burger as tiffin, about 12% respondents consumed chops (kebabs), about 10% respondents used to take different kinds of rolls, about 8% respondents used to eat hotdog, nearly 15% respondents had reported to eat pastry and rest of 7% respondents had eaten other junk items. Findings of the present study also showed that about 68% respondents had played computer games regularly. This is a sedentary habit and studies show influence of computer games on lifestyle of children. The prevalence of overweight and obesity in school-aged children in our study counter the results obtained from other studies. Spending more time on TV and Computer may be considered as predisposing factor for overweight.[16] In a cross sectional study of school children 9 to 16 years old from a low to middle income town in the Mexico City area, found that 24% of the children were obese (defined as >85th percentile BMI reference curves). Television viewing was associated with an increased risk for obesity, a 12% greater risk for each additional hour of daily TV viewing was estimated. Participating in physical activity, particularly vigorous physical activity was found to protect against obesity.[17]

As per findings of the present study, the average energy intake of male of normal BMI respondent (n = 136) was about 1576 kJ and the average energy intake of female of normal BMI respondent (n = 136) was about 1455 kJ. On the other hand, the average energy intake of male of risk BMI respondent (n = 144) was about 1819 kJ and the average energy intake of female of risk BMI respondent (n = 144) was about 1707 kJ.

A study included 14,659 students aged 10-14 years showed that the prevalence of overweight and obesity among males was 30.0% and 14.7%, respectively, while it was 31.8% and 13.1% among females.[18] In a study in the USA reported that 31.5% of the USA children and adolescents were at risk of overweight, and that 16.5% were actually overweight.[19] Studies showed children obtain snacks such as shops at schools, beside modification of food choices through effective education strategies may play a significant role in control of overweight and obesity among this age group.[20]

Our study found only 9% risk BMI respondents did physical activity regularly and 91% risk BMI respondents didn’t physical activity regularly; more than 11% were obese, 40% were overweight, and the rest of less than 49% were normal among the study respondents. A study showed that risk factors in childhood continues until the early next ages which requires extensive training and education. Educating the parents can had an effective role on prevention and controlling children’s over

weight and obesity and its subsequent outcomes.[21]

CONCLUSION

The present cross-sectional study found more than 51% respondents was found to be in risk condition depending on BMI. The anthropometric measure of the respondent is found significant in male and female students; 11% obese and 40% overweight are found in the study. Obesity/overweight regarding basic conception, attitudes and practices in the English medium school students is found to be risk in the study school in the present study. The effect of education based on behavioral intention model on elementary school students' attitude in association with physical activity related to the physical health, will be conducted to determine physical activity of the students based on behavioral intention model, their behavioral intention would be difference.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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