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Study on Lifestyle Practices among Secondary School Adolescents of Rural and Urban Areas in Bangladesh

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Abstract

An unhealthy lifestyle among adolescents is a serious and often unnoticed problem. It seems that there are differences in the lifestyle of adolescents from rural and urban areas. A comparative cross-sectional study among 420 adolescents (both urban and rural) who were selected purposively, attending in selected rural and urban secondary schools of Comilla from January to December 2019 with aim to compare lifestyle practices between rural and urban adolescents studying in secondary schools of Bangladesh**.** Data were collected by face-to-face interviewing of the respondents using a semi-structured questionnaire and a check list after having informed verbal consent. The collected data were checked for completeness and cross checked for consistency. Data were analyzed using SPSS version 26.0. Strict confidentiality was maintained for the collected data, while all sorts of ethical issues were taken into consideration. Among 420 students, 57.2% boys and 43.4% girls studying in urban schools and 42.8% boys and 56.6% of girls in rural schools, 65.1% rural students were underweight compared to 34.9%urban students as well as 60.6% urban students were overweight compared to 39.4%rural students and 72.7% urban students were obese compared to 27.3% rural students. Regarding the student's physical activity, statistically significant difference between urban and rural students were found as skipping (71.1% vs 28.9%; p=0.003); aerobics (58.3% vs 41.7%; p=0.038); swimming (31.5% vs 68.5%; p=0.000); cricket (56.0% vs 44.0%; p=0.046); football (57.9% vs 42.1%; p=0.041); basketball (77.8% vs 22.2%; p=0.016) were found. Urban students took mixed food 55% while rural students took 45% only. Fat intake was predominantly higher among urban students (80%) compared to rural students (20%). In this study 75% of urban students never ate fresh vegetables while 58.5% of rural students ate vegetables once a day. of urban red to urban students 56.5% rural students never took junk food, 57.8% rural students never took soft drinks and 64.9%rural students never took food in restaurants. The lifestyles of adolescent in the rural and urban areas are lightly different. Prevalence of underweight was higher among rural children and overweight and obesity was higher among urban students. To avoid overweight and obesity, adolescents should know about BMI and should maintain healthy lifestyles also initiate health promotion efforts, the level of awareness should be improved among the adolescents.

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Introduction

Lifestyles are considered to interact between life conditions and individual patterns of conduct, which are determined by socio-cultural factors and individuals' personal characteristics, according to WHO (Kickbusch, 1986). These factors include conducts and preferences related with food types, physical activities and consumption patterns (Wilson *et al.,* 1984). Living an inadequate lifestyle in adolescents can favor increased body weight, which, in recent years, has been related with a higher over-weight and obesity prevalence (de Onis*et al.,* 2010). There is a need for nutrition education to extend down to secondary school children. Moreover, establishing eating patterns & physical activity in adolescence can result in dietary habits that continue through adulthood. (Westenhoefer, 2002). Exposing children to balanced and nutrition food throughout childhood reinforces lifelong eating habits thus contributing to children overall well-being and helping them enjoy a healthy and fulfilling life in the future. The school therefore has the responsibility to promote healthy eating patterns whilst acknowledging that improving the nutrition starts of school aged children is an important investment for future generation. The prevalence of obesity in both high-income and low and middle-income country populations is increasing (Abegunde *et al.*, 2007). Among adolescents, the occurrence of overweight and obese individuals has drastically increased over the past few years. (Abegunde *et al.*, 2007). Adolescence is one of the most challenging periods in human development (Nana, 2002). The importance of regular physical activity is now well-established, as are the harmful consequences of sedentary lifestyles. The health benefits of physical activity are well recognized. They include reduced risks for non-communicable diseases such as cardiovascular disease, diabetes and various types of cancer.

WHO recommends that children and adolescents undertake at least 60 minutes of moderate to vigorous-intensity aerobic physical activity daily. Physical activity of amounts greater than 60 minutes daily will provide additional health benefits. Maintaining sufficient levels of physical activity is, however, becoming more and more difficult, as most daily environments have become more sedentary (Physical activity strategy for the WHO European Region 2016–2025). Furthermore, despite the known benefits of physical activity, according to the Euro barometer – a public opinion survey on sport and physical activity – nearly half (46%) of Europeans never exercise or play sport, and that proportion has increased gradually since 2009. According to the WHO European Childhood Obesity Surveillance Initiative, only small proportions currently meet this recommendation (Childhood Obesity Surveillance Initiative). Although the rate of childhood obesity has decreased in some countries, the rates remain high in Europe, and in many countries the proportion of children who walk or cycle to or from school has been decreasing (COSI, 2018). The prevalence of physical inactivity among adolescents is also high. Of the countries that participate in the Health Behavior in School-aged Children survey, only 23.1% of boys and 14.0% of girls aged 13–15 years reported that they met the WHO recommendation for daily physical activity (HBSC study, 2015). A school based health survey in 34 countries by (Guthold *et al.,* 2010) revealed that only 23.8% of males and 15% of female students met the standard recommendations of sixty minutes of physical activity/day (Stone, 2016.) Studies conducted in Turkey and Taiwan to assess the difference in physical activity among urban and rural school students showed a significant difference among their peers (Guthold *et al.,* 2010).

The quantity, strength, and consistency of evidence that relates dietary factors to chronic diseases. During adolescence young people are easily influenced by their peers, advertisements, particularly TV-advertising and last but not least all kinds of changes which occur in society. The food habits of the adolescents, meal patterns, physical activity, smoking and alcohol habits are influenced by the socio-economic conditions of the family, which has been observed in many studies from the Nordic countries, e.g. from Sweden (Samuelson *et al.,* 1971). Breakfast Studies from all the countries have shown that

breakfast is often skipped by the adolescents. A study noted by HoÈglund *et al.* from the western part of Sweden among 15 years olds (HoÈglund *et al.,* 1998) shows that many adolescents skipped breakfast, more often girls than boys. About 50% skipped this type of lunch, which was also found in other studies from other regions in Sweden, more often boys and more frequently in urban than rural regions. Instead they had for lunch sandwiches, cereals with milk or yoghurt or occasionally snack like soft drinks or sweets. Obesity in children and adolescents is rising alarmingly and approaching epidemic proportion in many economically developed countries, particularly in USA, Canada, Australia and several European countries (Wang *et al.,* 2006).

In developing countries this issue is emerging as a public health crisis. A study which is conducted by Mohsin *et al.* amongst school children in Dhaka aged between 3 to 18 years of age, found 17.9% obese and 23.6% overweight children and adolescents (Mohsin *et al.*, 2010). Most recent study (2013) reported by Das *et al.* among urban children, approximately a fivefold increase in overweight and obesity over the past two decades (Das *et al.,*2013).

A positive association between obesity with higher socio-economic status, lack of physical activity and urban residence has been reported in this study. A desirable dietary pattern (DDP) should be aimed at, with a proportion of no more than 60% dietary energy intakes (DEI) from cereals.

The desirable dietary pattern of nutrients for a country‘s population is recommended based on the current knowledge of nutritional requirements of different age and sex groups and the country‘s food and dietary habits. The comparative studies among urban and rural secondary school adolescents are limited. This study may help to divert attention to the direction. This study tended more to focus on adolescent health issue in a new arena. The wave widespread inactivity coupled with unhealthy dietary behavior has added an impetus to the non-communicable diseases.

Materials and methodology

Study design

A comparative cross-sectional study was carried out to determine the lifestyle practices of secondary school adolescents between rural and urban areas in Bangladesh.

Place of study

The study was carried out in two rural schools (Sayedpur High School & Nimshar High School) and two urban schools (Sheikh Fazilatunnesa Modern high school & Cumilla Sikkhaboard Model College).

These schools were selected due to good communications and availability of students.

Study period

The study period was one year from January to December, 2019.

Study population

The study population was adolescent students (13-18 years) in four secondary schools of Cumilla both in rural and urban areas.

Sample size

For this study sample size is calculated using the following formula:

$$\eta_0 = (Z_a + Z_b)^2 \ X \ \frac{(P_1Q_1 + P_2Q_2)}{(P_2-P_1)^2}$$

Where,

Z_a = 1.96 (at 5% Level of Significance)

Z_b = 0.84 (for 80% power of detecting difference)

P_1 = Prevalence of less physical activity level among adolescents of urban area. (Physical activity and inactivity patterns in Indian adolescents-result from the ICMR-INDIAB study)

=37.7% =0.37

P_2 = Prevalence of physical activity level among adolescents of rural area.

= 27.7 % =0.27

Q_1 = $1-P_1$=0.63

Q_2 = $1-P_2$=0.73

So, the desired sample size calculated is,

$$\eta = (Z_a + Z_b)^2 \times \frac{(P_1Q_1 + P_2Q_2)}{(P_2-P_1)^2}$$

$$= (1.96+0.84)^2 \times \frac{(0.2331+0.1971)}{0.01}$$

$$=7.84 \times 43.02$$

$$= 337.28$$

$$= 337$$

But 420 samples (210 in each group) were selected purposively.

Selection criteria

Inclusion criteria

Secondary school children (both boys and girls) who were willing to fill assent form to participate in the study, aged between 13-18 years.

Exclusion criteria

Students who were severely ill.

Sampling technique

Purposive sampling technique with eligible criteria was applied for selection of respondents.

Data collection instrument

Physical activity questionnaire for adolescent (PAQ-A) had been used. Number 1 question of this questionnaire had been modified for doing this thesis in Bangladesh perspective. A check list was used as another instrument. Data were collected by using semi-structured interviewer administered questionnaire contains all the variables of interest. Collected data were checked daily and edited accordingly.

Pre-testing

Prior to data collection, the data collection instrument and check-list were pre-tested among the adolescent students of Shimpur high school (rural) and Cumilla modern high school (urban). According to the finding of pre-testing necessary modification was done in the questionnaire.

Data collection technique

The purpose of the study was explained to the students (respondents) and after having informed written consent; respondents interviewed face to face chronologically as per questionnaire. The purpose of the study was explained to the respondents' ensuring their privacy and confidentiality of data.

Data processing

Collected data in questionnaire was checked for omission. It was verified, edited, coded and processed and finalized with omission and addition if any inconsistency found. Then finalized data was used for analysis as per selected key variables of the study to justify the objectives of the study.

Quality control

The study protocol development was followed standard format of BMRC with explanations of all scientific issues. Extensive literature reviews were done to develop the study protocol. Data collection instruments were pre-tested and corrected as per requirements. The instruments were translated into Bangla and validated among respondents. Data were kept confidential and its security was maintained strictly. During data analysis, appropriate statistical tools and techniques was used.

Data analysis

After completion of data collection, each question was checked for completeness. Data were entered into computer by using SPSS 22 software (Statistical Package for Social Sciences). Data analysis began with descriptive analysis. Means and standard deviations were calculated for continuous variables while frequencies and percentage were calculated for categorical variables, simultaneously to see the relationship and statistical significance Chi-Square test, t-test, correlation test done.

Ethical implications

The protocol was approved by Institutional Ethical Committee of Sir Salimullah Medical College. Informed written consent was obtained from legal guardian of the respondents and assent form was obtained from all the respondents. They were informed the purpose of the study and their right to

withdraw themselves from the project at any time, for any reason they want to. The legal guardian who gave informed consent for their children to participate in the study was included as respondents. Confidentiality of the respondents was maintained. Consent form was printed in both English and Bangla.

Results

This comparative cross sectional study was carried out among 420 secondary school adolescents of rural and urban areas in Bangladesh. Data were analyzed using appropriate statistical procedures and are presented in this chapter through tables and graphs.

Table 1. Distribution of the students by selective socio-demographic attributes (age, and sex).

Socio-Demographic Attributes	Urban schools (n=210)		Rural schools (n=210)	
Age	Frequency	Percent	Frequency	Percent
13-14	67	44.1	85	55.9
15-16	135	53.6	117	46.4
17-18	8	50.0	8	50.0
	Mean ± SD=14.94±1.06		Mean ± SD=14.76± 1.11	
Gender				
Male	115	57.2%	86	42.8%
Female	95	43.4%	124	56.6%

Information related to socio-demographic characteristics of the students, Table-1states that majority (53.6.3%) of them were age 15-16 years in urban schools and 55.9% had age 13-14years of age in rural school's students. Mean age of urban schools students were 14.94±1.06 years and 14.76± 1.11 years for rural schools students. Of them nearly half 57.2% were male and 43.2% were female students in urban schools while 56.6% were female & 42.8% were male students in rural schools.

Table 2. Comparison between urban and rural students by BMI**.**

BMI	Urban f(%)	Rural f(%)	Total f(%)	Significance
Underweight (<18.5)	51(34.9)	95(65.1)	146(100)	
Normal (18.5-24.9)	131(57.0)	99(43.0)	230(100)	
Overweight (25.0-29.9)	20(60.6)	13(39.4)	33(100)	$\chi^2 = 21.470$ df = 3 p = 0.000
Obese (≥30)	8(72.7)	3(27.3)	11(100)	

Table 2 states, majority of (65.1%) rural students were underweight compared to (34.9%) urban students as well as 60.6% and 43.4% urban students were overweight and obese respectively compared to rural students (39.4% and 27.3%). There were highly statistical significant differences in the level of BMI between these students of two (urban & rural) groups. (p= 0.000).

Table 3 states the comparison of students in urban and rural schools regarding the physical activity in last 7 days, in skipping 32 (71.1%) urban school students doing skipping compared to 13 (28.9%) of the rural school children and this difference statistically significant (p=0.003), while in walking, cycling, jogging and dance the comparison in urban and rural school students was not statistically significant (p = 0.201), (p = 0.919), (p = 0.490) and (p = 0.311). In aerobics and cricket among respondents, difference was statistically significant (p = 0.038) and (p = 0.046). In swimming difference was highly statistically significant (p = 0.000).

Table 3. Comparison between urban and rural students by physical activity in last 7 days (Skipping, walking, cycling, jogging, aerobics, swimming, dance, cricket, football, badminton, volleyball and basketball).

PA in spare time (Skipping)	Urban f(%)	Rural f(%)	Total f(%)	Significance
Yes	32(71.1)	13(28.9)	45(100)	$\chi^2 = 8.985$ df = 1 p = 0.003
No	178(47.5)	197(52.5)	375(100)	
Walking				
Yes	153(52.0)	141(48.0)	294(100)	$\chi^2 = 1.633$ df = 1 p = 0.201
No	57(45.2)	69(54.8)	126(100)	
Cycling				
Yes	74(50.3)	73(49.7)	147(100)	$\chi^2 = 0.010$ df = 1 p = 0.919
No	136(49.8)	137(50.2)	273(100)	
Jogging				
Yes	124(51.5)	117(48.5)	241(100)	$\chi^2 = 0.477$ df = 1 p = 0.490
No	86(48.0)	93(52.0)	179(100)	
Aerobics				
Yes	67(58.3)	48(41.7)	115(100)	$\chi^2 = 4.323$ df = 1 p = 0.038
No	143(46.9)	162(53.1)	305(100)	
Swimming				
Yes	39(31.5)	85(68.5)	124(100)	$\chi^2 = 24.213$ df = 1 p = 0.000
No	171(57.8)	125(42.2)	296(100)	
Dance				
Yes	42(55.3)	34(44.7)	76(100)	$\chi^2 = 1.028$ df = 1 p = 0.311
No	168(48.8)	176(51.2)	344(100)	
Cricket				
Yes	94(56.0)	74(44.0)	168(100)	$\chi^2 = 3.968$ df = 1 p = 0.046
No	116(46.0)	136(54.0)	252(100)	

Of them , the comparison of students in urban and rural schools regarding the physical activity in last 7 days, in football and basketball difference among urban and rural students statistically significant (p = 0.041) and (p = 0.016) while there was no statistically significant in badminton and volleyballs (p = 0.332) and (p = 0.411). Comparison of physical activity on physical exercise in physical education (PE) classes between urban and rural students in last 7 days, 55(51.9%) of urban school children and 51(48.1%) rural school children performing physical education (PE) class in last 7 days, not statistically significant differences between the both groups (urban & rural)(p=0.676). Regarding physical activity in school time between urban and rural students in last 7 days, 36.5% urban students and 63.5% rural students simply sat down (talking, reading or doing social work) during the lunch break at school. Sat down activity was higher among rural (63.5%) students compared to urban and was highly statistically significant difference between the groups regarding activity in lunch breaks. (p=0.000). Physical activity (PA) after school time between urban and rural students in last 7 days, 87.5% of urban and

only (12.5%) rural students were very active after school, was a significant difference (p=0.000). In weekend physical activity (PA), 7(58.3%) of the urban school students more times active compared to 5(41.7%) rural school students and this difference was not statistically significant (p = 0.274). Comparison between urban and rural students by constraints in doing physical activity in last 7 days, more than fifty percent (54.8%) of the rural school students face constraints in doing physical activity in last 7 days compare to 45.2% of urban students. No statistically significant difference was found between studied groups regarding constraints in doing physical activity (p=0.174). Regarding sleeping hours in day time the percentage of respondents who never sleep in day time was higher among the rural 63.4% as compared to the respondents of the urban and this difference was statistically significant (p = 0.000).

Table 4. Comparison between urban and rural students by favorite food and breakfast taking (everyday), frequency of taking fresh (green) vegetables, sweet foods, junk foods, soft drink and taking food in restaurants.

Favorite food	Urban f(%)	Rural f(%)	Total f(%)	Significance
High protein	29(39.7)	44(60.3)	73(100)	$\chi^2 = 9.229$ df = 3 p = 0.022
High carbohydrate	39(42.9)	52(57.1)	91(100)	
High fat	4(80.0)	1(20.0)	5(100)	
Mixed	138(55.0)	113(45.0)	251(100)	
Breakfast taking (everyday)				
Always	140(54.3)	118(45.7)	258(100)	$\chi^2 = 6.527$ df = 3 p = 0.089
Sometimes	49(40.8)	71(59.2)	120(100)	
Often	16(47.1)	18(52.9)	34(100)	
Never	5(62.5)	3(37.5)	8(100)	
Frequency of taking fresh vegetable				
Once a day	56(41.5)	79(58.5)	135(100)	$\chi^2 = 20.180$ df = 4 p = 0.000
Several times a day	59(49.2)	61(50.8)	120(100)	
Once a week	27(40.9)	39(59.1)	66(100)	
Several times a week	59(67.8)	28(32.2)	87(100)	
Never	9(75.0)	3(25.0)	12(100)	
Frequency of taking sweet foods				
Once a day	72(49.3)	74(50.7)	146(100)	$\chi^2 = 12.973$ df = 4 p = 0.011
Several times a day	31(35.2)	57(64.8)	88(100)	
Once a week	57(60.6)	37(39.4)	94(100)	
Several times a week	42(53.2)	37(46.8)	79(100)	
Never	8(61.5)	5(38.5)	13(100)	
Frequency of taking junk foods				
Once a day	67(45.6)	80(54.4)	147(100)	$\chi^2 = 13.044$ df = 4 p = 0.011
Several times a day	15(32.6)	31(67.4)	46(100)	
Once a week	55(54.5)	46(45.5)	101(100)	
Several times a week	63(61.2)	40(38.8)	103(100)	
Never	10(43.5)	13(56.5)	23(100)	
Frequency of taking soft drinks				
Once a day	48(51.6)	45(48.4)	93(100)	$\chi^2 = 4.070$ df = 4 p = 0.397
Several times a day	26(43.3)	34(56.7)	60(100)	
Once a week	55(49.1)	57(50.9)	112(100)	
Several times a week	62(56.4)	48(43.6)	110(100)	
Never	19(42.2)	26(57.8)	45(100)	
Frequency of taking food in restaurant				
Once a day	9(42.9)	12(57.1)	21(100)	$\chi^2 = 29.885$ df = 4 p = 0.000
Several times a day	2(66.7)	1(33.3)	3(100)	
Once a week	91(65.5)	48(34.5)	139(100)	
Several times a week	49(55.1)	40(44.9)	89(100)	
Never	59(35.1)	109(64.9)	168(100)	

Table 4 states regarding the Comparison between urban and rural students by favorite food high fat intake was higher percentage (80%) among urban school students then rural (20%). Statistically significant difference was found between studied groups regarding favorite food. (p = 0.022). In everyday taking breakfast and drinking soft drinks no statistical significant difference was found between the studied groups (p = 0.089) and (p= 0.397) respectively. Regarding intake frequency (fresh

vegetables) between urban and rural students, percentage of taking fresh vegetables several times a week by urban and rural students was 67% and 32.2%. Majority (75%) of the urban students never take fresh vegetables. Statistically significant differences were found between the two groups regarding taking fresh vegetables (p=0.000). Majority (61.5%) of the urban students never take sweets foods. Statistically significant differences were found between the two groups regarding taking sweet foods (p=0.011). Among respondents, percentage of taking junk food several times a week by urban and rural students was 61.2% and 38.8%. Majority (56.5%) of the rural students never take junk foods. Statistically significant differences were found (p=0.011).

Majority 64.9%) of the rural students never take food in restaurant. Statistically significant differences were found between these two groups regarding taking food in restaurant. (p=0.000).

Table 5. Comparison of selected attributes of mean BMI between urban and rural students.

Attributes		BMI			
		Urban		Rural	
		Mean (±SD)	Significance	Mean (±SD)	Significance
Skipping	Yes	22.22(±4.09)	t = 1.66	20.43(±4.30)	t = 1.00
	No	21.05(±3.60)	p = 0.098	19.45(±3.38)	p = 0.319
Walking	Yes	21.52(±3.86)	t = 1.87	20.01(±3.31)	t = 3.06
	No	20.45(±3.11)	p = 0.062	18.49(±3.50)	p = 0.003
Bicycling	Yes	20.24(±2.72)	t = -2.90	19.72(±3.57)	t = 0.64
	No	21.77(±4.04)	p = 0.004	19.40(±3.37)	p = 0.522
Jogging	Yes	20.96(±3.38)	t = -1.26	19.46(±3.64)	t = -0.22
	No	21.61(±4.10)	p = 0.210	19.57(±3.19)	p = 0.829
Aerobics	Yes	21.16(±3.26)	t = -0.19	20.15(±3.85)	t = 1.48
	No	21.26(±3.89)	p = 0.842	19.32(±3.30)	p = 0.141
Swimming	Yes	20.63(±3.04)	t = -1.12	19.48(±3.20)	t = -0.12
	No	21.37(±3.83)	p = 0.266	19.53(±3.61)	p = 0.907
Dance	Yes	22.23(±3.72)	t = 1.98	20.12(±4.22)	t = 1.14
	No	20.98(±3.66)	p = 0.049	19.39(±3.27)	p = 0.257
Cricket	Yes	20.68(±3.65)	t = -1.96	19.77(±3.43)	t = 0.80
	No	21.68(±3.69)	p = 0.051	19.37(±3.45)	p = 0.424
Football	Yes	20.42(±3.44)	t = -2.27	19.96(±3.77)	t = 1.07
	No	21.64(±3.76)	p = 0.024	19.36(±3.33)	p = 0.284
Badminton	Yes	23.20(±4.43)	t = 3.02	20.27(±4.09)	t = 1.41
	No	20.94(±3.50)	p = 0.003	19.36(±3.29)	p = 0.161
Volleyball	Yes	22.74(±4.88)	t = 0.82	19.32(±0.20)	t = -0.08
	No	21.20(±3.68)	p = 0.411	19.51(±3.46)	p = 0.939
Basketball	Yes	21.73(±3.04)	t = 0.53	18.26(±1.44)	t = -0.74
	No	21.19(±3.74)	p = 0.599	19.53(±3.46)	p = 0.463
Others	Yes	18.96(±2.57)	t = -2.49	18.44(±2.36)	t = -1.11
	No	21.40(±3.72)	p = 0.013	19.57(±3.49)	p = 0.268

Table 5 states, in all the selected attributes, the mean of BMI in the urban school students were higher than those of rural school students. Statistically significant differences of mean BMI between the two students groups (urban & rural) regarding walking (p=0.003), bicycling (p=0.04), dance (p=0.049), football (p=0.024), badminton (p=0.003), others (p=0.013) was found.

Table 6. Correlation between age of the student and BMI.

Factors	BMI			
	Urban		Rural	
	R	P	R	P
Age	-0.148	0.032	0.094	0.175

Table 6 showed, age was negatively correlated with BMI in the urban students (r= - 0.148; p =-.032) but not in the rural students (r=0.094; p=0.175).

Discussion

The objective of this study to compare lifestyle practices between rural and urban adolescents studying in secondary schools of Bangladesh. It was a comparative cross-sectional study conducted among (13-18) aged school children from selected school of urban and rural areas. In this study, among 420 students, maximum (53.6%) of the urban school students belong to age group (15-16) years whereas (55.9%) of rural students within age group of (13-14) years. The reason behind this age group was the selection criteria of the sample as this study interviewed the adolescent (13-18) age group.

The study findings revealed that among 420 students, 57.2% boys and 43.4% girls studying in urban schools and 42.8% boys and 56.6% of girls in rural. A study conducted by Kundapurin Karnataka in 2017 where they found 56% boys and 44% girls studying in urban schools and 53.3% boys and 46.6 % girls in rural. When we compare our findings with this study regarding distribution of sex in urban school students almost similar as our study but differ in rural settings (Kundapur*et al.*,2017). In this study, among urban schools, the prevalence rate of underweight, overweight and obese where 34.9%, 60.6% & 72.7% while in the rural schools they were 65.1%, 39.4% and 27.3% respectively. The majority of urban (57%) and rural (43%) were normal BMI. Prevalence of underweight was higher among rural children (65.1%) than children from urban areas (34.9%). This findings consistent with other studies carried out in Croatia (Coli c-Bari, 2004), Lowa (Roxane *et al*., 2008) and in Bangladesh (Bulbul *et al.,* 2014).Possible reasons behind this findings might be were low socioeconomic condition, low education level of the parents or large number of family size. It was also consistent with other study conducted in Bangladesh where proportion of obese (5.6%) and overweight (10.6%) students were greater among the students from urban schools compared to the students from rural schools (Bulbul *et al.,* 2014). Possible explanation might be student's intake more calories from food or stressful life or poor sleep pattern of student.

Highly significant difference was found between these two groups (urban and rural) in terms of level of BMI. (p=0,000). Age was negatively correlated with BMI of the urban students (r= - 0.148; p=-.032) but not in the rural students. (r=0.094; p=0.175). Urban children had significantly higher BMI, as compared to the rural children (Bulbul *et al.,* 2014). In developing countries, the rapid progress of urbanization is associated with a cluster of non-communicable diseases and unhealthy lifestyles, which results in very high rates of obesity and its consequent morbidity and mortality. Moreover, in such communities, childhood obesity is still considered a sign of healthiness and high social class (Kelishadi, 2007).

Promoting physical activity during childhood is an important strategy to avoid the increasing rates of overweight and obesity among children and young adults. (Trostet, 2001). Regarding the students physical activity in spare time, statistically significant difference between urban and rural students groups regarding skipping (71.1% vs 28.9%; p=0.003); aerobics (58.3% vs 41.7%; p=0.038); swimming (31.5% vs 68.5%; p=0.000); cricket (56.0% vs 44.0%; p=0.046); football (57.9% vs 42.1%; p=0.041); basketball (77.8% vs 22.2%; p=0.016) were found.

The results may appear contradictory given that urban children had higher level of physical activity than rural children, yet had a higher prevalence of being overweight and obesity. It might be occur mainly because of an imbalance between energy intake from the diet and energy expenditure through their physical activities. In this study when compared mean BMI between urban and rural students by physical activity. It shows that in the entire selected attribute, the mean of BMI in the urban school students were higher than those of rural school students. This can be attributed to the fact that lack of school playground, spending time in watching TV by

urban students. In Bangladesh, the number of obese children has also increased due to industrialization & urbanization resulting in higher proportion of obese children in the urban areas (Nasrin *et al.,* 2016). Rural students reported that least activity during physical education class which was similar with Croatian study (Coli c-Bari, 2004) but significant difference was not found.

The significant differences in physical activity among urban children as compared to children from rural areas were more active during lunch time while at school. (p=0.000) which was differ from Croatian study (Coli c-Bari, 2004). Urban children reported that less activity in the evening (p=0.046) and activity in last weekend than children from rural areas but more activity after school by urban students and it was highly significant differences between these groups (p=0.000). This can be attributed to the huge academic work load due to the content-heavy syllabus in urban Bangladeshi schools, which creates work pressure among the students. Moreover, the pressure from teachers and parents to excel in academics force them to join additional coaching or tuition classes after school hours.

In this study, 55% urban students took mixed food that was carbohydrate, protein and fat compare to rural students (45%). Fat intake was predominantly higher among urban students that's why BMI findings was also high in urban groups in our study.

Urban students in this study were more likely to skip breakfast than rural, the difference was not statistically significant. A systematic review showed that eating breakfast is associated with a reduced risk of overweight and obesity and reduction in BMI in children and adolescents (Szajewska *et al.,* 2010). The data of current study showed that vegetables are more consumed by rural children than urban and it was statistically significant difference between these two groups. Low-income households might be contributing factor for these findings. The findings of current research were supported by the study of Aziz and Devi. There were significant difference was found between the two groups in the frequency of the sweets food (p=0.001) and junk food (p=0.011). These items were more consumed by urban students. The current findings regarding junk food and sweets food consumption amongst rural and urban children are supported by the study of Aziz & Devi that instant noodles and chocolate are more consumed by urban children than rural children. Likewise, (McNaughton *et al.,* 2006) also investigated that children living in urban areas consumed greater amounts fast food as compared to children living in rural areas.

In this study urban students dine in restaurants than rural students. The results of dine outdoor by rural and urban school children are in concordance with the finding of Abuzaid who demonstrated that eating out at fast food restaurants was higher among urban than rural.Eating out is major contributor to childhood obesity. Studies show that calorie content of out of home meals that children consumed was 55% higher than that of in home meals (Mandal, 2014).

Conclusion

Adolescence is one of the most challenging periods in human development. The adolescent period is one of the highly vulnerable periods during the lifestyles chosen become determining factors for future health status. The lifestyles of adolescent in the rural and urban areas were lightly different. Adolescents studying in urban schools had better physical activities compared to rural school. In this study prevalence of underweight was higher among rural children and overweight and obesity was higher among urban students. In the urban areas the most frequent dietary pattern were preference for fast food, soft drinks, frequent consumption of sweets while in rural areas frequency of fresh vegetables intake were higher. This study finding revealed that inadequate physical activity and more fatty food intake causes overweight & obesity of urban students than rural students.

On the basis of findings of the study following recommendation are forwarded to

- To lower the risk of obesity, the physical activity and outdoor sports of adolescence need to be given a higher priority during the school curriculum development.
- To initiate health promotion efforts, the level of awareness should be improved among the adolescents.
- To avoid overweight and obesity, adolescents should know about BMI and should maintain healthy lifestyles.

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