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Original Article

Factors and Prevalence of Obesity among School Children in Urban Setting

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ABSTRACT

Introduction: *Childhood obesity and overweight were initially recognized as diseases prevalent in developed countries with higher per capita incomes. Overweight is characterized by an excess of body weight in relation to height, while obesity refers to an excessive amount of body fat.* ***Objectives:*** *The aim of this paper was to determine the dietary and physical activity related factors and prevalence of obesity among the children of an urban setting in Bangladesh.* ***Methods & Materials:*** *This descriptive type of cross-sectional study was conducted in 11 selected primary and secondary schools during January.2024-June, 2024 in Cumilla City Corporation area of Bangladesh. Purposive random sampling technique was used and a total of 220 children aged 6-16 years were enrolled in this study.* ***Results:*** *A total of 220 children were enrolled in this study. The average age of the children was 12.5±1.5 years. The majority of the children were boys 121(55%). Most of the children 216 (98.18%) were from nuclear families. The highest proportion 209 (95%) of the children were Muslim. According to socio-economic status distribution, 176 (80%) of the children belonged to upper class and followed 33 (15%) middle class, and 11 (5%) lower socio-economic status.* ***Conclusion:*** *This study investigated that 26.36% children had overweight and 51 (23.18%) children were observed obese. At the same time, not participating in household chores, not taking part in outdoor games and sports, eating fast food for school*

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tiffin, eating rich food from restaurant at regular meal, not eating vegetables at regular meal, not eating fruits intake daily, and eating red meat daily were the most significant factors for the incidence of obesity among the children living in the urban area of Bangladesh.

Keywords: *Dietary, Physical, Activity, Factors, Prevalence, Overweight, Obesity*

INTRODUCTION

Childhood obesity and overweight were initially recognized as diseases prevalent in developed countries with higher per capita incomes[1]. Overweight is characterized by an excess of body weight in relation to height, while obesity refers to an excessive amount of body fat[2]. The World Health Organization (WHO) defines overweight as having a body mass index (BMI) over 25, and obesity as having a BMI over 30[3]. The prevalence of overweight and obesity among children has escalated, becoming a global public health issue[4,5]. In developing countries with emerging economies, the rising trend of childhood overweight and obesity presents a significant challenge to the healthcare system[6]. Although these conditions are more prevalent in developed countries, their rates are also increasing in developing nations[7,8]. Overweight and obesity in children primarily result from energy imbalances between calories consumed and expended, often due to excessive calorie intake or insufficient physical activity. These conditions are precursors to metabolic syndrome, poor physical health, mental disorders, respiratory issues, and glucose intolerance, potentially continuing into adulthood[9]. Factors contributing to childhood overweight and obesity include poor nutrition, lack of physical activity, high socioeconomic status, urban living, traditional beliefs, and aggressive marketing by food companies[10]. This public health concern is significant in the 21st century, affecting many middle- and low-income countries, particularly in urban areas[8]. Studies have suggested various reasons for the increasing rates of childhood overweight and obesity, such as reduced physical activity, increased screen time, urban residency, and family social status[11-13]. More research is needed to address global health issues like childhood obesity and overweight to protect children from future health consequences. There are significant differences in the prevalence of these conditions among children based on various factors. In Bangladesh, limited studies and data exist on the factors and prevalence of childhood obesity in urban settings. Therefore, this paper aims to determine the dietary and physical activity related factors and prevalence of obesity among the children of an urban setting in Bangladesh.

OBJECTIVES

Specific Objective:

- To determine the dietary and physical activity related factors and prevalence of obesity among the children of an urban setting in Bangladesh.

General Objectives:

- To know the demographic features of the study children.
- To measure and classify the BMI of the study children.
- To identify the overweight and obese children.
- To determine the dietary and physical activity related factors and prevalence of obesity.

METHODS

This descriptive type of cross-sectional study was conducted in 11 selected primary and secondary schools during January.2024-June, 2024 in Cumilla City Corporation area of Bangladesh. Written informed consent was obtained from the parents/ legal guardian of the children purposive random sampling technique was used and a total of 220 children aged 6-16 years were enrolled in this study. A pre-structured questionnaire was prepared and the demographic, dietary and physical activity related data were collected were through face to face interview and the height and weight of the children were measured in an standard approach and the measurement was kept in a case record form. Body mass index was assessed to classify children following the Centers for Disease Control and Prevention age and sex-specific cutoff points. Data were analyzed using Statistical Package for Social Sciences (SPSS), version 23.0. Descriptive statistical analysis were performed and the results were performed in tables, graphs and charts. The inclusion and exclusion criteria of this study were as follows:

Inclusion Criteria:

1. Age: (6-16) years.
2. Sex: Boys and girls
3. Able to participate in the study
4. Agreed to give written consent.

Exclusion Criteria:

1. Age: Above 16 years
2. Gender: Third gender
3. Unable to participate in the study
4. Disagreed to give written consent.

RESULTS

Table 1 shows the demographic characteristics of a sample of 220 children. The largest proportion of children, 90 (40.90%), falls within the 15-16 age group, followed by 65 (29.54%) in the 12-14 age group and 40 (18.18%) in the 9-11 age group. The mean age for the sample is 12.5 years with a standard deviation of (±1.5). In terms of education, 90 (40.90%) of the children are in grades X-SSC, followed by 65 (29.54%) in grades VII-IX and 40 (18.18%) in grades IV-VI. The religion distribution shows that 209 (95%) of the children identified as Muslim, while 7 (3.18%) were Hindu and 4(1.81%) were others religious. Additionally, 216 (98.18%) of the children came from nuclear families, and 4 (1.18%) come from extended families. In terms of socio-economic status, 176 (80%) of the children belong to the upper class, 33 (15%) to the middle class, and 11 (5%) to the lower socio-economic status.

Table-1: Demographic Characteristics of the Study Children (*n*=220)

Age(years)	Frequency	Percent
6-8	25	11.36
9-11	40	18.18
12-14	65	29.54
15-16	90	40.90
Total	220	100
Mean Age (years)	12.5±1.5	
Mode	9	
Median	11	
Gender		
Boys	121	55
Girls	99	45
Total	220	100
Grade		
I-III	25	11.36
IV-VI	40	18.18
VII-IX	65	29.54
X-SSC	90	40.90
Total	220	100
Religion		
Muslim	209	95
Hindu	7	3.18
Others	4	1.81
Total	220	100
Type of family		
Nuclear	216	98.18
Extended	4	1.81
Total	220	100
Socio-economic condition		
Upper	176	80
Middle	33	15
Lower	11	5
Total	220	100

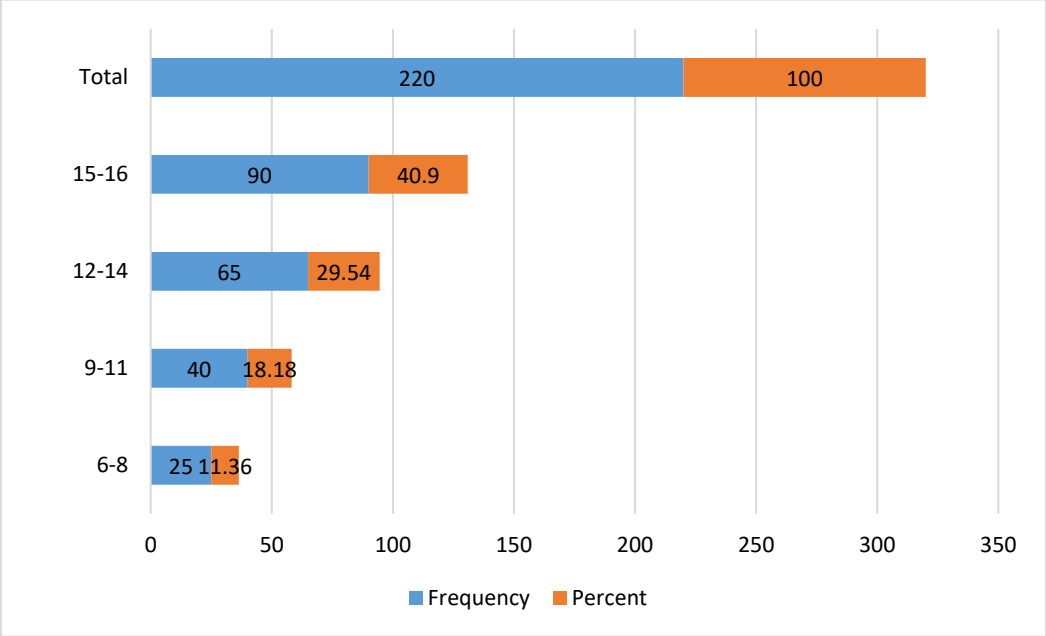

Figure – 1: Shows the Age Distribution of the Study Children (*n*-220)

Figure 1 illustrate the age distribution of the study children. Number of children in 15-16 years age group is higher 90 (40.9%) compared to other age groups. 65 (29.54%) ware in 12-14 years age group.

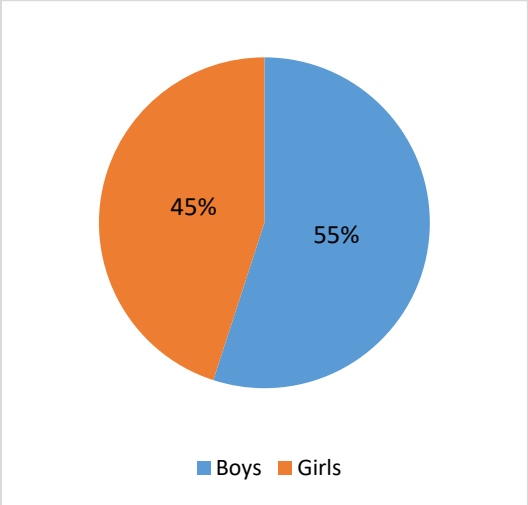

Figure – 2: Shows the Gender Distribution of the Study Children (*n*-220)

Figure 2 illustrate the gender distribution of study children. 45% boys and 55% girls.

Table II presents the body mass index (BMI) classifications of 220 children in the study. The underweight category includes 30 (13.63%) children with a BMI below the normal range. The normal weight category is the largest group, comprising 81 (36.81%) children with a BMI within the normal range. There are 58 (26.36%) children classified as overweight, with a BMI above the normal range but below the obesity threshold. In the obese category, there are 51 (23.18%) children with a BMI significantly above the normal range.

Table – II: BMI Classifications of the Study Children (*n*=220)

BMI Classification	Frequency	Percent
Underweight	30	13.63
Normal weight	81	36.81
Overweight	58	26.36
Obese	51	23.18
Total	220	100

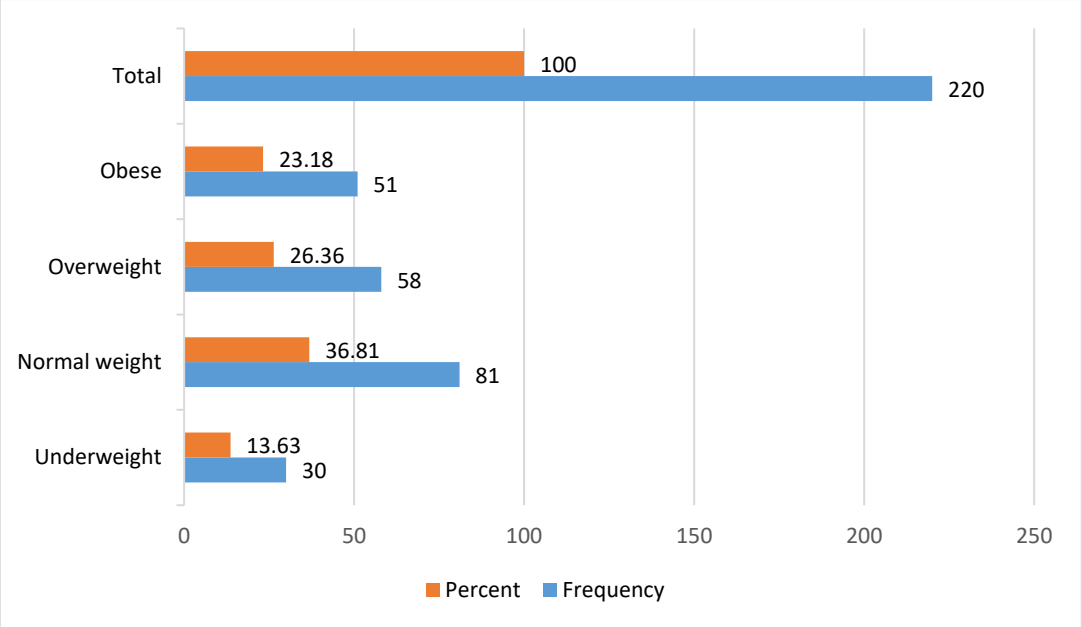

Figure – 3: Shows the BMI Classification of the Study Children (*n*=220)

Figure 3 shows the number of children according to BMI group. The figure shoes that the highest number of children in normal weight group 81(36.81%) and lowest 30(13.63%) in Underweight group.

Table III shows a higher percentage of children who did not participate in household chores fell into the overweight 52(89.65%) and obese 47(92.15%). A significant majority of underweight 19(63.33), overweight 51(87.93%), and obese 48(94.11%) children did not participate in outdoor games and sports. Children consuming homemade food for school tiffin mostly fell into the overweight 35(60.34%) and obese 30(58.82%) children consumed fast food. 35(68.62%) obese and 10(17.24%) overweight children ate rich food from restaurants. The majority of underweight 23(76.66%), overweight 53(91.37%), and obese 46(90.19%) children did not consume vegetables in regular meal. A significant number of underweight 24(80%), overweight 49(84.48%), and obese 45(88.23%) children did not eat fruits intake. 47(92.15%) obese children consumed red meat, whereas 4 (7.84%) did not consume.

Table – III: Habitual Factors and Prevalence of BMI Classifications of the Study Children (*n*=220)

Factors	Underweight (*n*=30)	Normal (*n*=81)	Overweight (*n*=58)	Obese (*n*-51)
Participating in household chores				
Yes	8(26.66)	57(70.37)	6(10.34)	4(7.84)
No	22(73.33)	24(29.62)	52(89.65)	47(92.15)

Taking part in outdoor games and sports				
Yes	11(36.66)	73(90.12)	7(12.06)	3(5.88)
No	19(63.33)	8(9.87)	51(87.93)	48(94.11)
Food Practice for school tiffin				
Homemade	2(6.66)	67(82.71)	5(8.62)	4(7.84)
Fast food	10(33.33)	2(2.46)	35(60.34)	30(58.82)
Dairy Products	3(10)	1(1.23)	2(3.44)	1(1.96)
Street food	3(10)	1(1.23)	1(1.72)	0(0)
Ice-cream	5(16.66)	3(3.70)	7(12.06)	10(19.60)
Chocolate	2(6.66)	5(6.17)	6(10.34)	5(9.80)
Cake/Loaf	5(16.66)	2(2.46)	2(3.44)	1(1.96)
Food Practice for a regular meal				
Homemade	6(20)	76(93.82)	21(36.20)	5(9.80)
Fast-food	9(30)	0(0)	0(0)	8(15.68)
Rich food from restaurant	12(40)	4(4.93)	10(17.24)	35(68.62)
Sweet food	3(10)	0(0)	0(0)	3(5.88)
Habit of consuming vegetables in regular meal				
Yes	7(23.33)	75(92.59)	5(8.62)	5(9.80)
No	23(76.66)	6(7.40)	53(91.37)	46(90.19)
Consumption of fruits intake(≤5 days) in a week				
Yes	6(20)	77(95.06)	9(15.51)	6(11.76)
No	24(80)	4(4.93)	49(84.48)	45(88.23)
Consumption of red meat				
Yes	8(26.66)	55(67.90)	46(79.31)	47(92.15)
No	22(73.33)	26(32.09)	12(20.68)	4(7.84)

DISCUSSION

In our study, we aimed to determine the factors and the prevalence of overweight obesity among primary and secondary school children in an urban setting of Bangladesh. According to our study, 58 (26.36%) children were overweight, with a BMI above the normal range but below the obesity threshold and 51 (23.18%) children were obese with a BMI significantly above the normal range. These findings of this present study are in the lineage of some other studies conducted in South Asia and some other countries[13-18]. In our study, we focused on the dietary and physical activity related determinants of obesity and consequently, we observed that a higher percentage of children who did not participate in household chores were overweight 52(89.65%) and obese 47(92.15%). In this present study we also found a significant majority of the children were, overweight 51(87.93%), and obese 48(94.11%) who did not participate in outdoor games and sports.

These findings of our study claimed that assisting household activities and participating in outdoor games and sports are the two major factors related to obesity and overweight. Similar physical activity related factors were also found in another study conducted on Bangladesh context[19]. In this present study, we also observed that the children who ate other than co homemade foods like fast food, chocolate, ice-cream and dairy products for school tiffin mostly fell into the overweight 35(60.34%) and obese 30(58.82%). This present study also found that the children who ate other than homemade food like fast food, rich food from restaurant and sweet foods got overweight and obesity and the majority of the obese children ate outside rich food 35(68.62%) and 10(17.24%) children had overweight who ate rich food from restaurants. The majority of underweight 23(76.66%), overweight 53(91.37%), and obese 46(90.19%) children did not consume vegetables in regular meal and a significant number of underweight 24(80%), overweight 49(84.48%), and obese 45(88.23%) children did not eat fruits intake. 47(92.15%) obese children consumed red meat, whereas 4 (7.84%) did not consume. These findings of our study revealed that fast food, outside rich food, sweet food consumption and at the same time no consumption of fruits and vegetables are the major factors related to the prevalence of childhood overweight and obesity of the urban children of Bangladesh. Almost similar observation was found in another study conducted in India[20]. Therefore, this study suggests that the urban children need to be involved in indoor and outdoor games and sports as well as they have to eat homemade food rather than fast food, outside rich food and red meat. At the same time, the children in the urban setting should eat more fruits and vegetables in their regular meals to avoid childhood mortality and other associated diseases.

Limitations Of the Study

This cross-sectional study was conducted only on some purposive selected sampling in a selected urban setting of Bangladesh. Therefore, the findings of this study may not reflect the whole Bangladesh.

Conclusion

This study investigated that 26.36% children had overweight and 51 (23.18%) children were observed obese. At the same time, not participating in household chores, not taking part in outdoor games and sports, eating fast food for school tiffin, eating rich food from restaurant at regular meal, not eating vegetables at regular meal, not eating fruits intake daily, and eating red meat daily were the most significant factors for the incidence of obesity among the children living in the urban area of Bangladesh

Recommendations

A national survey is recommended to determine the present status of epidemiology of childhood obesity in Bangladesh.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval

The study was approved by the Institutional Ethics Committee.

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