Prevalence and Predictors of Obesity in School Aged Children in Dhaka City

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Abstract

Background: *Childhood obesity is a growing global public health concern, with urban areas experiencing a sharp increase due to lifestyle and dietary changes. Obesity is a significant public health problem among school-aged children in Dhaka City, Bangladesh. Understanding the factors that predict childhood obesity can guide the development of preventive strategies. This study aimed to evaluate the prevalence and key predictors of obesity among school-aged children in Dhaka City.*

Methods: *This cross-sectional observational study was conducted on 100 children aged 6–14 years from public and private schools in Dhaka City from January 2023 to June 2024. Structured questionnaires, anthropometric measurements, and BMI-for-age percentiles collected the data. All statistical analyses were performed using SPSS version 25.0.*

Results: *The prevalence of overweight and obesity was 56%. Boys (66.07%) and students from private schools (62.50%) had higher rates of obesity. Low physical activity (p < 0.05), high screen time (p < 0.05), and a high-fat diet (p < 0.05) were significant predictors. Parental obesity was also a strong predictor.*

Conclusion: *This study found that the significant burden of childhood obesity in Dhaka City varies according to lifestyle and socioeconomic factors. Implementing targeted interventions emphasizing parenting education, physical activity, and food practices is essential to combat this trend.*

Keywords: *Childhood obesity, Prevalence, Risk factors, School-aged children, Urban health, Bangladesh.*

1. INTRODUCTION

Obesity among children is now a significant public health concern in many countries and has increased dramatically over the past few decades [1]. Despite being regarded as a matter of health concern mainly limited to high-income countries, the burden of childhood obesity is moving to low and middle-income countries, such as Bangladesh, due to fast urbanization, changing dietary patterns, and decreased physical activity levels [2,3]. The rising prevalence of obesity in school-aged children is a complex problem with consequences, impacting both metabolic diseases, cardiovascular diseases and psychosocial risks, all of which continue into adulthood and can have repercussions for the individual child or adolescent as well as the community as a whole [4,5].

There is an alarming rise in the rate of obesity among children in urban areas in Bangladesh, especially in Dhaka. A systematic literature review revealed an increasing trend of overweight and obesity in children and adolescents, with urban school-going population at risk [6]. Recent reports from Dhaka have suggested that dietary patterns, low physical activity, parental obesity, and socioeconomic conditions are among the various determinants of this rising epidemic [7]. Nevertheless, much of the epidemiological evidence on the prevalence and risk factors of childhood obesity in Bangladesh are lacking as this issue has been increasingly recognized as a priority within public health.

Previous studies conducted in Bangladesh have reported mainly on the prevalence of overweight and obesity in children and the relationship with the

consumption of calorie-rich diets, lack of physical activity and genetic factors [8,9]. Bhuiyan et al., in a case-control study in urban Bangladesh, reported that dietary habits, screen time and parental obesity were found to be important determinants of childhood overweight and obesity [2]. Although these studies shed light on various aspects of obesity, a substantial gap persists in identifying the predictors or risk factors of obesity across Dhaka's demographic and socio-economic spectrums over time.

The current study has been designed to fill the gap and determine the prevalence and predictors of obesity among school-aged children in Dhaka City. Through identifying key risk factors, this study strives to guide efforts in addressing and informing targeted intervention and policy recommendations to reduce the increasing prevalence of obesity in this at-risk group. The results will be key in developing future public health initiatives to prevent childhood obesity and its long-term health consequences.

2. OBJECTIVE

The objective of this study was to determine the prevalence of obesity and identify its predictors among school-aged children in Dhaka City.

3. METHODOLOGY & MATERIALS

This cross-sectional observational study was conducted in various schools across Dhaka City from January 2023 to June 2024. 100 students were included in the study, selected through random sampling from different schools. The study population consisted of children aged 6 to 14 years, ensuring a diverse representation across age groups, socioeconomic backgrounds, and school types (public and private).

3.1. Sample Selection

Inclusion Criteria

- Children aged 6 to 14 years.
- Enrolled in public or private schools in Dhaka city.
- Parents/guardians provided written informed consent.

Exclusion Criteria

- Children with chronic illnesses affecting growth or metabolism.
- Those on long-term medication that may influence weight.
- Incomplete or unreliable data from participants.

3.2. Data Collection Procedure

Data was collected using structured questionnaires and anthropometric measurements. The questionnaire included sections on demographics, dietary habits, physical activity, and screen time. Using standardized equipment following WHO guidelines, anthropometric measurements, including height, weight, and BMI. The BMI-for-age percentile was used to classify children as normal weight, overweight, or obese. Informed consent was secured from parents/guardians. The confidentiality of participant data was strictly maintained.

3.3. Statistical Data Analysis

Data analysis was performed using SPSS version 25.0. Descriptive statistics, such as mean, standard deviation, and frequency distributions, were used to summarize participant characteristics. Chi-square tests assessed associations between obesity and demographic, lifestyle, and socioeconomic factors. A p-value <0.05 was considered statistically significant.

4. RESULTS

Table 1. *Demographic characteristics and prevalence of obesity (n=100)*

Characteristic	Categories	Frequency (n)	Overweight/Obese (n=56)
Age Group (years)	6–8	27	11 (19.64)
	9–11	42	24 (42.86)
	12–14	31	21 (37.50)
Gender	Boys	58	37 (66.07)
	Girls	42	19 (33.93)
School Type	Public	47	21 (37.50)
	Private	53	35 (62.50)

Table 1 presents the demographic distribution of the study population (n=100) and the prevalence of overweight/obesity within each subgroup. Among participants, 56% were classified as overweight or obese. The highest prevalence was in the 9–11 age group (42.86%), followed by the 12–14 years group (37.50%). Boys had a higher proportion of overweight/obesity (66.07%) compared to girls (33.93%). Children attending private schools exhibited a higher prevalence (62.50%) than those in public schools (37.50%).

Table 2. *Lifestyle and behavioral factors associated with obesity (n=100)*

Factor	Categories	Normal Weight (n=44)	Overweight/Obese(n=56)
Physical Activity	≥5 times/week	26 (59.09)	25 (44.64)
	<3 times/week	18 (40.91)	31 (55.36)
Screen Time	<2 hours/day	15 (34.09)	22 (39.29)
	>4 hours/day	29 (65.91)	34 (60.71)
Dietary Habit	Balanced Diet	25 (56.82)	23 (41.07)
	High-Fat/Processed Diet	19 (43.18)	33 (58.93)

Table 2 outlines lifestyle and behavioral factors influencing weight status. Among overweight/obese children, 55.36% engaged in physical activity fewer than three times per week, while 44.64% exercised at least five times weekly. Screen time was higher among overweight/obese children, with 60.71% spending over four hours daily in sedentary activities. Dietary habits were crucial, as 58.93% of overweight/obese children consumed a high-fat or processed diet, compared to 41.07% who followed a balanced diet.

Table 3. *Socioeconomic and sedentary factors that affecting obesity (n=100)*

Factor	Categories	Normal Weight(n=44)	Overweight/Obese (n=56)
Maternal Education	Primary	11 (25.0)	13 (23.21)
	Secondary	19 (43.18)	21 (37.50)
	Higher Education	14 (31.82)	22 (39.29)
Parental BMI	Normal (<25 kg/m²)	29 (65.91)	21 (37.50)
	Overweight/Obese (≥25)	15 (34.09)	35 (62.50)
Household Income	Low	24 (54.55)	22 (39.29)
	High	20 (45.45)	32 (57.14)
Sedentary Behavior (hours/day)	<2 hours	15 (34.09)	9 (16.07)
	2-4 hours	18 (40.91)	19 (33.93)
	>4 hours	11 (25.0)	28 (50.0)

Table 3 details socioeconomic and sedentary behavior influences on obesity. Maternal education correlated with obesity risk, as 39.29% of overweight/obese children had mothers with higher education, while 23.21% had mothers with primary education. Parental BMI was a strong predictor, with 62.50% of overweight/ obese children having overweight or obese parents.

Household income contributed, with 57.14% of overweight/obese children from higher-income families. Sedentary behavior was higher in overweight/obese children, with 50% spending over four hours daily in sedentary activities compared to 25% of normal-weight children.

5. DISCUSSION

The current study assessed the prevalence and determinants of obesity among school-aged children in Dhaka City, showing a substantial burden of childhood obesity associated with several sociodemographic and behavioral factors. Based on 15 papers, the results showed that the predictable obesity in this population was due to parental, sedentary lifestyle and poor dietary habits. Such trends in childhood obesity among Bangladesh and other developing countries have also been shown previously. However, differences in the specific associations with risk factors indicate possible regional and contextual factors.

Our findings are in line with previous studies that demonstrate a rising rate of childhood obesity in Bangladesh. Bhuiyan et al. determined a similar prevalence of obesity in urban school children with the predominant influence of dietary habits and physical inactivity [2]. Similarly, Alam et al. showed that children from higher socioeconomic status were more prone to obesity [3]. Internationally, Gupta et al. pointed out that urbanization, altering food habits, and lack of exercise are speeding the obesity epidemic in developing countries [5]. These findings highlight the implications of the nutrition

transition in Bangladesh, as the Westernization of diet is gaining popularity [10].

Despite these similarities, differences were noted in the magnitude and predictors of obesity. For instance, Hossain et al. Primary school children in Dhaka were reported to have a lower prevalence of obesity (8%) by Rahman et al. [4]; however, differences in the characteristics of sampled populations or measurement criteria may explain these conflicting results. In addition, while our study observed a significant association between parental obesity and obesity in the offspring, Fuemmeler et al. observed a moderating influence of parental weight status on children's appetitive phenotypes, demonstrating complex gene–environment interactions [1]. These differences suggest a need for more research addressing the complexity of the development of obesity in children.

Our findings have significant implications for clinical practice, public health policies and future research. Because of the close relationship between parental obesity and childhood weight status, family-centered interventions should be a priority. More than any other, targeted education programs about lifestyle behaviors will be key to preventing the transmission of obesity between generations. School-based interventions that promote physical activity and healthy dietary habits should also be reinforced, as recommended by the World Health Organization (WHO) [11].

From a policy perspective, the results of our study underscore the pressing need for a national approach to addressing childhood obesity. Multisectoral approaches, which include implementing regulatory measures on unhealthy food marketing, improving the provision of school meals, and urban planning to promote physical activity, have been highlighted in the WHO's Strategic Action Plan (2016-2025) as key approaches requiring action [12]. Bangladesh, which is currently undergoing the double burden of malnutrition, needs to adopt obesity prevention strategies in tandem with strategies to reduce undernutrition [13]. Obesity has been increasing in both developed and developing countries, and unless this trend is reversed, it is likely to pose an increasing future burden of non-communicable diseases [14, 15].

Further understanding of genetic and epigenetic factors related to obesity susceptibility among Bangladeshi children would also enable us to gain these insights. Furthermore, evaluating the impact of currently implemented public health interventions can be used to evaluate further how to improve obesity prevention programs in Bangladesh. This study underlines the increasing burden of childhood obesity in Dhaka City and calls for urgent public health intervention. Combating parental obesity, educating families on healthy lifestyles, and following proven policies are essential in the fight against this growing health issue.

6. CONCLUSION

Our research highlights the increasing incidence of childhood obesity in Dhaka, identifying significant factors such as parental obesity, eating patterns, and inactive lifestyles. These results emphasize the necessity for immediate, comprehensive actions involving educational institutions, families, and policymakers to reduce the long-term health dangers linked to childhood obesity. The study also stresses the importance of ongoing research to develop strategies that are specifically adapted to Bangladesh's socio-cultural environment.

7. LIMITATIONS AND RECOMMENDATIONS

This study's small sample size and single-city focus may limit the generalizability of the findings. Self-reported lifestyle data could introduce recall bias, and the cross-sectional design prevents causal inferences. Future research should use larger, multi-center longitudinal studies to establish causal relationships. Policymakers and educators can use these findings to implement targeted childhood obesity prevention strategies.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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