

Original Research

Juvenile Diabetes: Awareness and Risk Factors among Adolescents of Bangladesh

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Abstract

Background: Juvenile diabetes is a growing public health concern in Bangladesh, with the country's ethnic population being particularly vulnerable to developing the condition. However, little is known about the risk factors and awareness levels associated with juvenile diabetes among adolescents in this region.

Objective: This study aimed to identify the proportion and associated risk factors of type 1 diabetes at 250 Bed General Hospital, Jamalpur, while also assessing their awareness regarding diabetes mellitus.

Methods: An analytical cross-sectional study was conducted among 280 adolescents aged 6-19 years in Dhaka city between October 2019 and March 2020. Data were collected through a structured questionnaire, and statistical analysis was performed using SPSS version 20.

Results: The findings revealed a high prevalence of overweight individuals (88.57%) and a predominance of sedentary lifestyles (46.43%) among the participants. Lifestyle risk factors (50.36%) and nutritional risk factors (35.71%) were identified as the most prevalent contributors to juvenile diabetes, followed by a family history of diabetes (15.36%). Alarming, 28.21% of the participants were unaware of diabetes mellitus.

Conclusion: The study highlights the alarming prevalence of modifiable risk factors, such as unhealthy lifestyles and obesity, as well as the lack of awareness regarding diabetes mellitus among adolescents in Dhaka, Bangladesh. These findings underscore the urgent need for targeted interventions, including educational campaigns, promotion of healthy lifestyles, and early screening programs, to mitigate the growing burden of juvenile diabetes in this vulnerable population.

Introduction

Bangladesh, with its staggering population density and developing economic status, faces a unique public health challenge – an alarming predisposition to diabetes, particularly among its youth ^{1,2}. Numerous studies have highlighted the disproportionately high risk of type 2 diabetes in South Asian populations, including Bangladeshis when compared to their Western counterparts³⁻⁶. This vulnerability extends to children and adolescents, with reports indicating that South Asian youth are up to 13 times more likely to develop type 2 diabetes than their white peers ³⁻⁵.

The Health Survey for England 2004 painted a concerning picture, revealing that doctor-diagnosed diabetes was nearly four times more prevalent in Bangladeshi men and at least three times more prevalent in Pakistani and Indian men compared to the general population⁶. Among women, the disparity was even more striking, with Pakistani women being more than five times more likely to have diabetes, and Bangladeshi, Black Caribbean, and Indian women facing risks ranging from 2.5 to 3 times higher than the general population⁶. While these alarming statistics

underscore the urgency of the situation, a notable knowledge gap exists – there has been a dearth of studies specifically examining the prevalence of diabetes among Bangladeshi children and adolescents. A previous study⁷ estimated the prevalence of impaired fasting glucose (IFG) and type 2 diabetes mellitus (T2DM) at 3.4% and 1.8%, respectively, in this population, indicating a disturbingly high rate. However, the lack of prior research in Bangladesh and neighboring countries makes it challenging to contextualize these findings. Nonetheless, studies conducted among migrant Bangladeshis in the UK and Indian Americans in the USA lend credence to the notion that the observed prevalence rates align with the elevated risk faced by these communities⁸⁻¹⁰. Beyond the medical implications, type 1 diabetes mellitus (T1DM) poses significant social challenges for affected children, with financial constraints often being the most formidable hurdle. Societal stigma, lack of motivation, inability to manage complications, dropout from clinical care, and psychological issues further compound the difficulties faced by these young individuals¹¹. In light of this pressing issue, our study aims to unravel the risk factors contributing to the development of type 1 diabetes among Bangladeshi adolescents. The overarching objective is to identify the proportion and associated factors of type 1 diabetes in this population. Specifically, we seek to describe the socio-demographic and socio-economic characteristics of type 1 diabetic adolescents and assess their current diabetes status. By shedding light on these critical aspects, we hope to pave the way for targeted interventions and improved disease management strategies, ultimately safeguarding the well-being of Bangladesh's youth.

Methodology and materials

This study employed an analytical cross-sectional design to investigate the risk factors associated with juvenile diabetes 250 at Bed General Hospital, Jamalpur. Conducted between October 2019 and March 2020, the research encompassed a total sample of 280 participants from various sites within Dhaka city, purposefully selected to

meet the specified criteria. The target population consisted of adolescents aged 6 to 19 years, encompassing both boys and girls. Participation in the study was contingent upon obtaining consent from the individuals themselves. The sample was conveniently selected through a non-probability sampling technique, ensuring that the participants met the predetermined inclusion and exclusion criteria. Specifically, adolescents with mental illness, inability to respond to the questionnaire accurately, or those affected by other chronic diseases were excluded from the study. Conversely, individuals aged 19 years or younger, regardless of gender, and willing to provide consent were eligible for inclusion. Data collection was facilitated through a structured questionnaire, which was coded by the researcher prior to data entry into a computer for analysis. The statistical analysis was performed using SPSS version 20 software, with data being appropriately checked, edited, and coded before analysis.

Results

Table 1: Distribution of participants by baseline characteristics (N=280)

Baseline Characteristics	Frequency	Percentage
Gender		
Male	146	52.14%
Female	132	47.14%
Age		
<15	94	33.57%
15-19	186	66.43%

Regarding gender distribution, there was a slight predominance of male participants, constituting 52.14% (146 individuals) of the sample, while females accounted for 47.14% (132 individuals). In terms of age, the majority of the participants, 66.43% (186 individuals), were between 15 and 19 years old, classified as late adolescents. The remaining 33.57% (94 individuals) were below 15 years of age, representing early adolescents.

Table 2: Distribution of participants by BMI category (N=280)

BMI	Frequency	Percentage
Normal	32	11.43%
Overweight	248	88.57%

The study examined the body mass index (BMI) of the participants, categorizing them as either

normal or overweight. The findings revealed a striking contrast, with a substantial majority of 88.57% (248 individuals) being classified as overweight. Conversely, only 11.43% (32 individuals) had a normal BMI within the recommended range

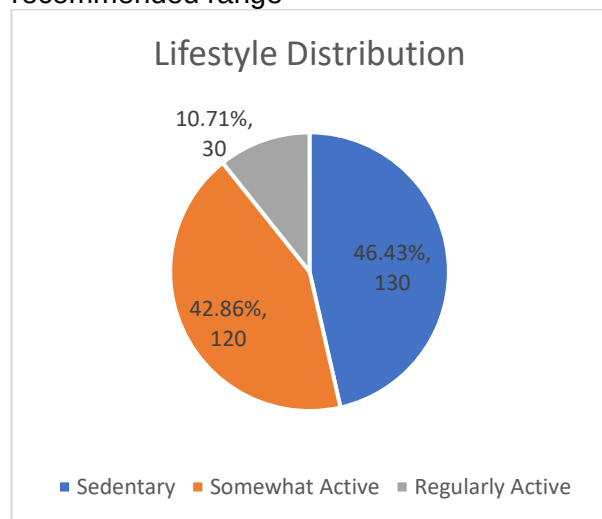


Figure 1: Distribution of participants by lifestyle

Figure 1 shows the lifestyle distribution of participants. The majority, 46.43%, had a sedentary lifestyle. A large portion, 42.86%, were somewhat active. Only 10.71% were regularly active.

Table 3: Distribution of risk factors among the participants (N=280)

Risk Factors	Frequency	Percentage
Lifestyle risk factors	141	50.36%
Nutritional risk factors	100	35.71%
Family history of diabetes	43	15.36%
Other risk factors	9	3.21%

The study identified various risk factors contributing to juvenile diabetes in the sample population. The most prevalent risk factor was lifestyle-related, with 50.36% (141 participants) exhibiting lifestyle risk factors. Nutritional risk factors were the second most common, observed in 35.71% (100 participants) of the sample. Family history of diabetes was also a significant risk factor, present in 15.36% (43 participants) of the study population. Additionally, 3.21% (9 participants) were identified as having other risk factors not categorized under the aforementioned groups.

Table 4: Distribution of participants by awareness of diabetes mellitus (N=280)

Awareness Regarding Diabetes	Frequency	%
Well Aware	179	63.93%
Somewhat Aware	22	7.86%
Unaware	79	28.21%

The majority of participants, 63.93% (179 individuals), were well aware of diabetes mellitus. A small proportion, 7.86% (22 individuals), were somewhat aware of the condition. However, a significant 28.21% (79 individuals) were unaware of diabetes mellitus.

Discussion

The present study aimed to investigate the risk factors associated with juvenile diabetes among adolescents in Dhaka, Bangladesh. The findings reveal a concerning prevalence of overweight individuals within the study population, with an overwhelming majority (88.57%) falling into this category. This observation aligns with the growing global epidemic of childhood obesity, which has been recognized as a significant risk factor for the development of type 2 diabetes in adolescents¹². Similar trends have been reported in neighboring countries, such as India, where a study conducted by Ramachandran et al. (2002) found a high prevalence of overweight and obesity among urban adolescents, particularly in the higher socioeconomic strata¹³. Furthermore, the lifestyle distribution of the participants underscores the potential impact of sedentary behavior on the risk of developing diabetes. A staggering 46.43% of the study population led a predominantly sedentary lifestyle, while only a small fraction (10.71%) engaged in regular physical activity. These findings are consistent with a study by Burton et al. (2020), which highlighted the alarmingly high levels of physical inactivity among urban adolescents¹⁴. Numerous studies have established a strong link between physical inactivity, sedentary behavior, and an increased risk of obesity and diabetes^{15, 16}. Notably, the study identified lifestyle and nutritional risk factors as the most prevalent contributors to juvenile diabetes among the participants, accounting for 50.36% and 35.71%, respectively. These findings resonate with the well-documented association between unhealthy dietary patterns, sedentary lifestyles,

and the development of type 2 diabetes in youth^{17, 18}. A study by Naqshbandi et al. (2008) conducted in India revealed similar trends, with dietary and lifestyle factors playing a significant role in the increasing prevalence of type 2 diabetes among adolescents¹⁹. Interestingly, the study also revealed that a substantial proportion of participants (15.36%) had a family history of diabetes, which is recognized as a significant risk factor for the development of both type 1 and type 2 diabetes^{20, 21}. This finding is consistent with the genetic predisposition observed in South Asian populations, as reported by various studies^{22, 23}. Notably, the study highlighted a concerning lack of awareness regarding diabetes mellitus among a considerable portion (28.21%) of the participants. This finding resonates with a study conducted by Islam et al. (2014) in Bangladesh, which identified low levels of knowledge and awareness about diabetes among the general population²⁴. Lack of awareness can significantly hinder preventive efforts and early intervention, exacerbating the burden of diabetes in this vulnerable population. The strengths of this study lie in its comprehensive assessment of various risk factors, including lifestyle, nutritional, and familial aspects, as well as the evaluation of awareness levels among adolescents in Dhaka, Bangladesh. However, the study's limitations include the use of a non-probability sampling technique, which may limit the generalizability of the findings to the broader adolescent population in Bangladesh. Additionally, the cross-sectional nature of the study precludes the establishment of causal relationships between the identified risk factors and the development of juvenile diabetes. In conclusion, the present study highlights the alarming prevalence of overweight individuals, sedentary lifestyles, and unhealthy dietary patterns among adolescents in Dhaka, Bangladesh, which contribute significantly to the risk of developing juvenile diabetes. Furthermore, the findings underscore the importance of addressing the lack of awareness regarding diabetes mellitus in this population. Targeted interventions focused on promoting healthy lifestyles, improving nutrition education, and enhancing diabetes awareness are crucial to mitigating the rising burden of juvenile diabetes in Bangladesh and ensuring the well-being of its youth.

Conclusion

The findings of this study shed light on the alarming prevalence of risk factors associated with juvenile diabetes among adolescents in Dhaka, Bangladesh. The high proportion of overweight individuals, coupled with sedentary lifestyles and unhealthy dietary patterns, points to a pressing need for targeted interventions aimed at promoting healthy lifestyles and preventing obesity in this vulnerable population. Moreover, the identified familial risk factors underscore the importance of genetic predisposition and the need for early screening and preventive measures. Perhaps most concerning is the lack of awareness regarding diabetes mellitus among a significant portion of the study participants. This knowledge gap highlights the critical need for comprehensive educational campaigns and awareness programs tailored specifically for adolescents and their families. By addressing this deficit, we can empower individuals to make informed decisions and take proactive steps toward disease prevention and management. Ultimately, the findings of this study serve as a call to action for policymakers, healthcare professionals, and stakeholders to prioritize the development and implementation of multifaceted strategies addressing the multitude of risk factors contributing to juvenile diabetes in Bangladesh. Only through a concerted effort involving awareness campaigns, lifestyle interventions, and targeted screening programs can we effectively mitigate the growing burden of this chronic condition and safeguard the well-being of Bangladesh's future generations.

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