Prevalence of Diabetes Mellitus, Associated Risk Factors, Complications, and Preventive Awareness among Adults in Chattogram, Bangladesh: A Cross-Sectional Study

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DOI: https://doi.org/10.51244/IJRSI.2026.1315PH00083

Received: 08 April 2026; Accepted: 14 April 2026; Published: 08 May 2026

ABSTRACT

Diabetes mellitus (DM) is a rapidly growing global public health concern, particularly in low- and middle-income countries like Bangladesh. This study aimed to determine the prevalence of diabetes mellitus, associated risk factors, complications, and preventive awareness among adults in Chattogram, Bangladesh. A community-based cross-sectional study was conducted from January to June 2025 in the Chawkbazar area of Chattogram. A total of 380 adults aged 18–60 years were selected using a convenience sampling technique. Data were collected through structured questionnaires and analyzed using Microsoft Excel. Descriptive statistics were applied. The prevalence of diabetes mellitus was 29.47% among the study population. Equal distribution was observed between males and females (14.72% each). Awareness of diabetes was high (96.58%), but regular monitoring was low (38.68%). Major recognized risk factors included obesity (87.37%), unhealthy diet (87.63%), and low physical activity (84.47%). Preventive knowledge was relatively high, particularly regarding diet control and physical activity (>88%). Awareness of complications such as cardiovascular disease (82.12%), vision loss (83.68%), and diabetic foot (82.89%) was also notable. The study reveals a high prevalence of diabetes in urban Chattogram, with good awareness but inadequate preventive practices. Targeted public health interventions focusing on lifestyle modification and routine screening are urgently needed.

Keywords: Diabetes mellitus, prevalence, risk factors, complications, Bangladesh, public health

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both (Petersmann et al., 2019). It is a major contributor to global morbidity and mortality and is associated with complications such as cardiovascular disease, neuropathy, nephropathy, and retinopathy (Tomic et al., 2022; Akkus & Sert, 2022).

According to the International Diabetes Federation, approximately 537 million adults were living with diabetes in 2021, and this number is projected to rise to 783 million by 2045 (Sun et al., 2022). A substantial proportion of individuals remain undiagnosed, particularly in low- and middle-income countries (Ogurtsova et al., 2022).

Urbanization, sedentary lifestyles, and unhealthy dietary habits are major contributors to the increasing burden of diabetes, especially in South Asian countries (Ranasinghe et al., 2021; Ruze et al., 2023). In Bangladesh,

recent studies have reported a growing prevalence of diabetes and its associated risk factors, including obesity, hypertension, and physical inactivity (Sathi et al., 2022; Hossain et al., 2022).

Diabetes also imposes a significant economic burden, particularly in developing countries like Bangladesh (Afroz et al., 2020). Additionally, cardiovascular complications remain one of the leading causes of mortality among diabetic patients (Glovaci et al., 2019). Type 2 diabetes accounts for more than 90% of all diabetes cases globally (Cloete, 2021).

Despite national-level data, localized studies are essential to understand community-specific patterns. Therefore, this study aimed to assess the prevalence, risk factors, complications, and preventive awareness of diabetes mellitus among adults in Chattogram, Bangladesh.

METHODOLOGY

A community-based cross-sectional study was conducted in the Chawkbazar area of Chattogram, Bangladesh, from January to June 2025.Study Population was adults aged 18–60 years residing in the study area were included. The sample size was calculated using the formula: $n = Z^2pq / d^2$ (Talukder & Hossain, 2020).

Final sample size (with 10% non-response): 380 participants. Convenience sampling was employed. Data were collected using structured questionnaires, a commonly used method in cross-sectional public health research (Rahman et al., 2020). Data were analyzed using Microsoft Excel. Descriptive statistics (frequency and percentage) were used. Ethical approval was taken from the University of South Asia

RESULTS

The majority of participants were aged 26–33 years (35%), followed by 42–60 years (29%).

Among 380 respondents, 23% (from 88 respondents) were from 18-25 years, 35% (from 131 respondents) from 26-33 years, 13% (from 49 respondents) from 34-41 years and the rest were 29% (from 112 respondents) from 42-60 years and above.

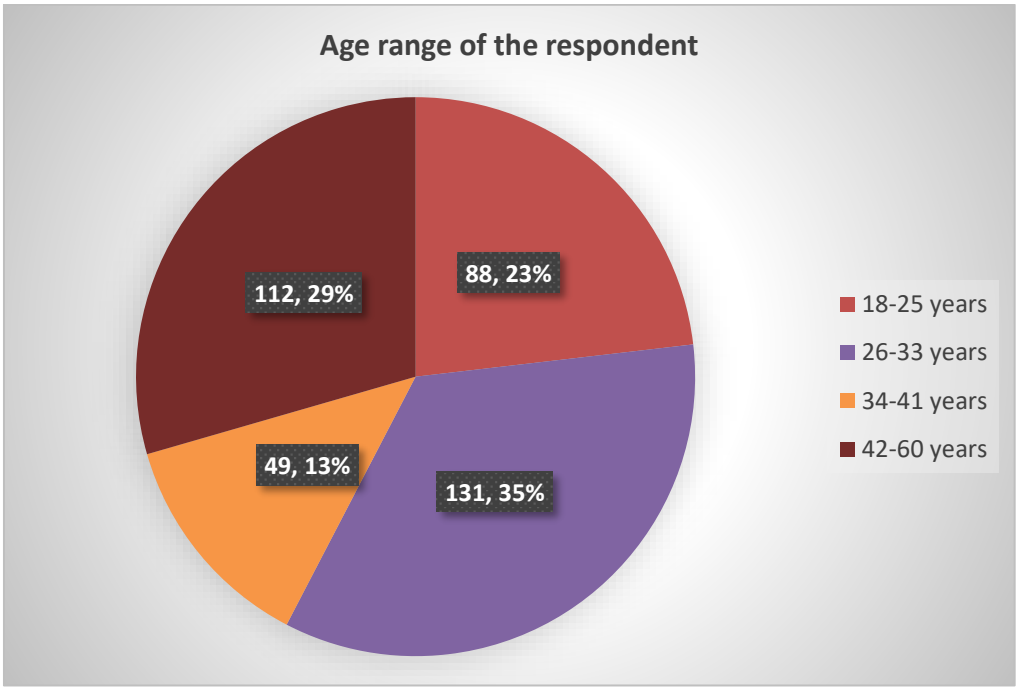

Figure 1: Age range of the respondent.

According to figure 2 to among the respondents, 57.36% (from 218 respondents) were male, 42.63% (from 162 respondents) were female.

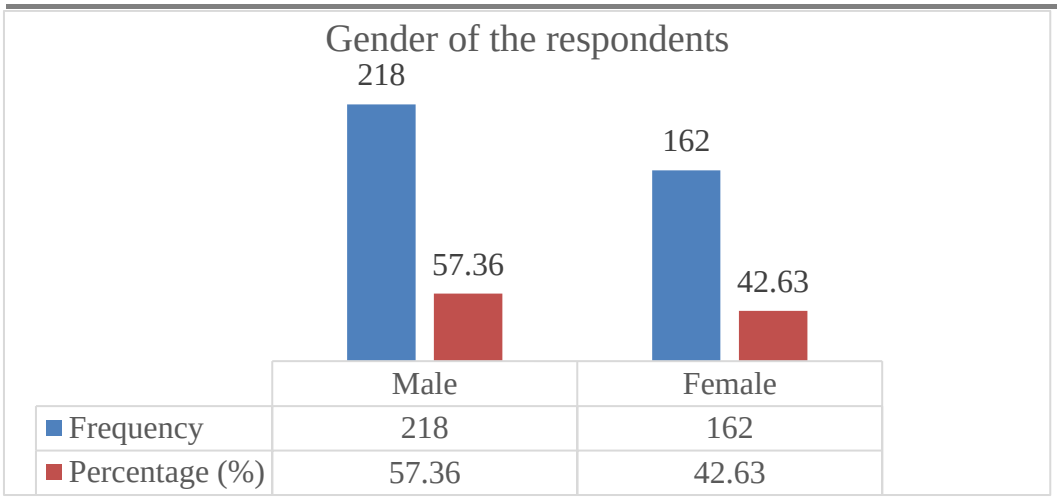

Figure 2: Gender of the respondents.

Among 380 respondents 62.37% were married, 34.47% were single, 1.58% were widowed and 1.58% were divorced.

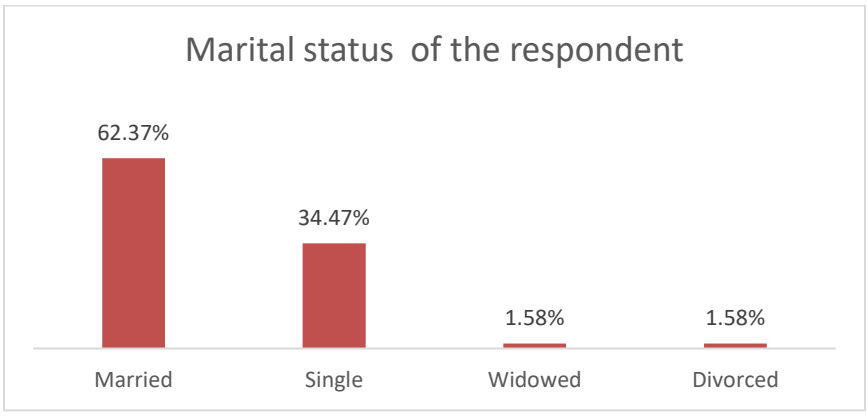

Figure 3: Marital status of the respondents.

Among 380 respondents, 11.84% were from illiterate, 6.84% were from up to class 5, 19.74% were from up to class 10, 16.58% were from higher secondary, 6.32% were from under graduate 38.68% were from graduate and above.

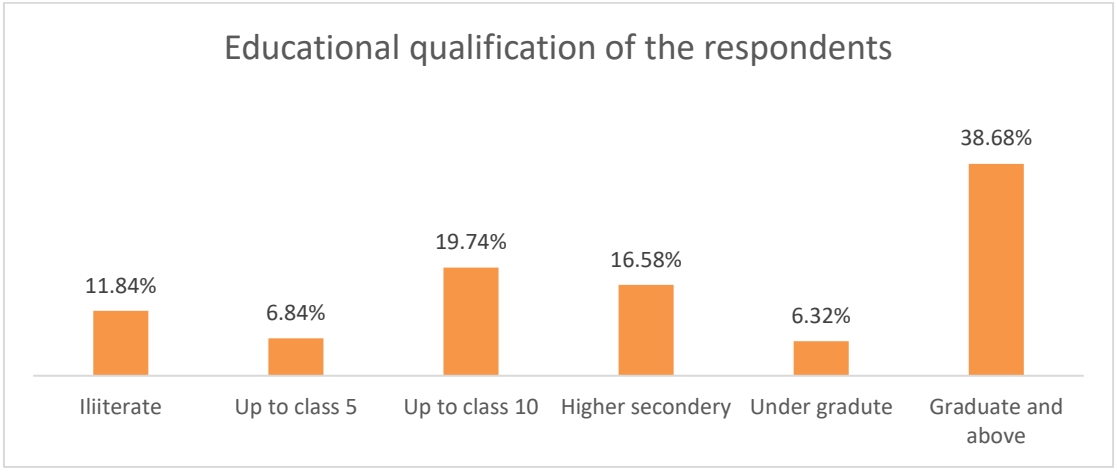

Figure 4: Educational qualification of the respondents.

According to figure 5, 84% (from 318 respondents) were from Muslim, 14% (from 52 respondents) were from Hindu and 2% (from 10 respondents) were from others.

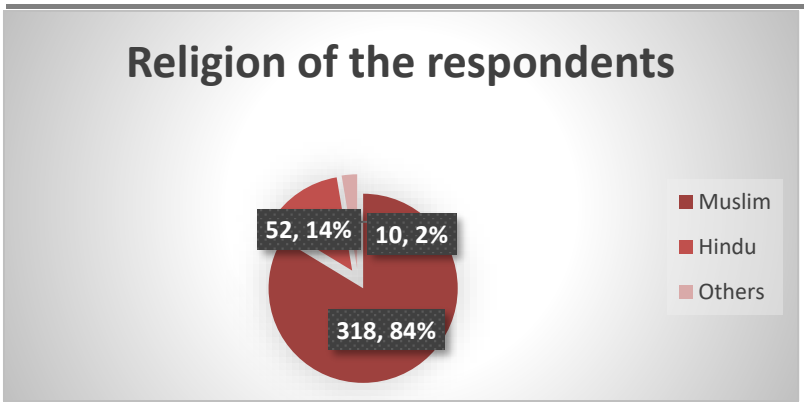

Figure 5: Religion of the respondents.

Among 380 respondents, 42.63% (from 66 respondents) were from business, 10.79% (from 41 respondents) were students, 29.21% (from 111 respondents) were unemployed and 42.63% (from 162 respondents) were employed.

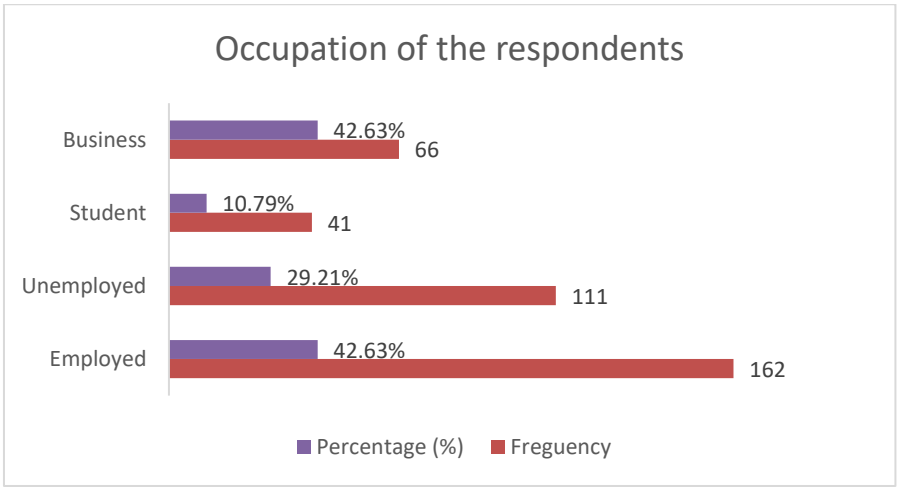

Figure 6: Occupation of the respondents.

Among 380 respondents 92% were from urban, 3% were from rural and 5% were from semi-urban.

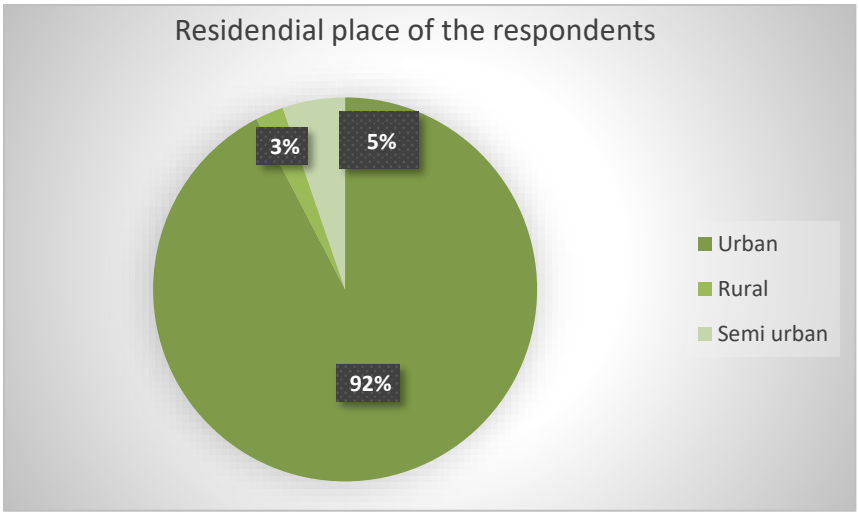

Figure 7: Residential place of the respondents.

Among 380 respondents, 45.53% from 10,000-30,000 monthly income range, 9.47% from 30,000-50,000 montly income range , 9.47% from 50,000 and above, 35.26% from none.

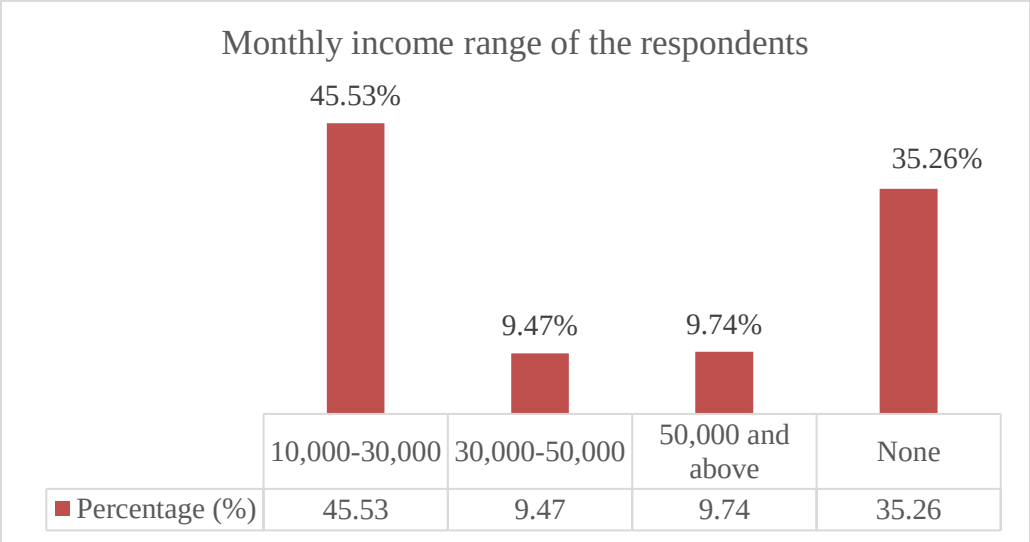

Figure 8: Monthly income range of the respondents.

Table 1: Awareness and screening practices among participants (n = 380)

Among 380 respondents, heard of diabetes was 96.58% from 367 respondents and no heard of diabetes was 3.42% from 13 respondents. Heard of glucose tolerance test was 33.16% from 126 respondents and no heard of it was 66.84% from 254 respondents. Measure of diabetes was 47.11% from 179 respondents and did not measure blood glucose was 52.89% from 201 respondents. Regular checkup of diabetes was 38.68% from 147 participants and no regular checkup for diabetes was 61.32% from 233 participants.

Heard of diabetes	**Frequency**	**Percentage (%)**
Yes	367	96.58
No	13	3.42
Heard of glucose tolerance test		
Yes	126	33.16
No	254	66.84
Measure of diabetes		
Yes	179	47.11
No	201	52.89
Regular checkup for diabetes		
Yes	147	38.68
No	233	61.32

Among 380 respondents, suffering from diabetes was 29% (from 112 respondents) and no suffering from diabetes was 71% (from 268 participants).

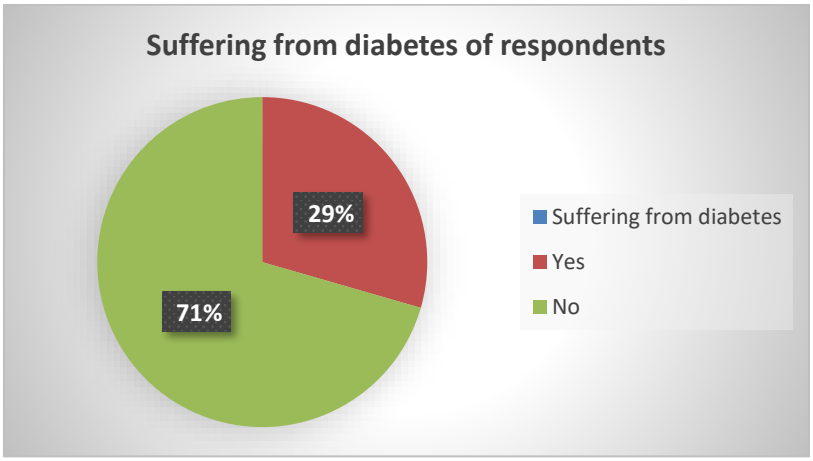

Figure 9: Suffering from the diabetes of the respondents

Table-2: According to Table 2, suffering from diabetes was 14.72 % (from 56 participants) and 14.72% respondents was female

Suffering from diabetes	Frequency	Percentage (%)
Male	56	14.72 (from 380 respondents)
Female	56	14.72 (from 380 respondents)

Among 380 respondents, 50% male was suffering from diabetes and 50% female was suffering from diabetes

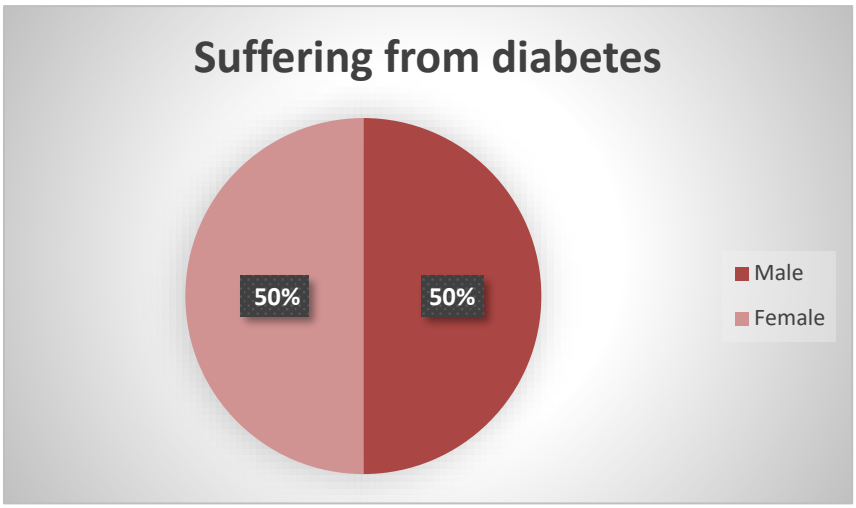

Figure 10: Suffering from diabetes of male and female.

Table 3: In risk factors, Among 380 respondents, participants know excessive alcohol consumption causes to diabetes were 47.63% (from 181 respondents)and they no know excessive alcohol consumption causes to diabetes were 52.37% (from 199 respondents). Participants know Smoking cigarette/ tobacco were 42.63% (from 162 respondents) and respondents no know Smoking cigarette/ tobacco causes to diabetes were 57.37% (from 218 respondents). Participants know obesity/ overweight causes to diabetes were 87.37 (from 332 respondents) and participants no know obesity/overweight causes to diabetes were 12.63% (from 48 respondents). Participants know low physical activity causes to diabetes were 84.47% (from 321 respondents) and they no know low physical activity causes to diabetes were 15.53% (from 48 respondents). Participants know unhealthy diet causes to diabetes (eating highly processed foods, high amounts of fatty foods, low fiber intake) were 84.63% (from 333 respondents) and they no know them causes to diabetes were 12.37% (from 47 respondents). Respondents know genetic predisposition/history of diabetes in the family causes to diabetes was 62.63% (from 238 respondents) and they no know them causes to diabetes were 37.37% (from 142 respondents).

The risk factor for diabetes	Frequency	Percentage (%)
Excessive alcohol consumption		
Yes	181	47.63
No	199	52.37
Smoking / cigarette		
Yes	162	42.63
No	218	57.37
Obesity		
Yes	332	87.37
No	48	12.63
Low physical activity		
Yes	321	84.47
No	59	15.53
Unhealthy diet		
Yes	333	87.63

No	47	12.37
Genetic predisposition		
Yes	238	62.63
No	142	37.37

Table 4: Among the respondents, in diabetes prevention methods, participants know to limited intake of fat in the diet/ regular physical activity prevent from diabetes were 88.42% (from 336 respondents) and they no know them prevent from diabetes were 11.58% (from 44 respondents). Respondents know to limited consumption of carbohydrates (sugar) in the diet prevent from diabetes were 88.42% (from 336 respondents) and they no know them prevent from diabetes were 11.58% (from 44 respondents). Participants know limited alcohol consumption prevent from diabetes were 59.47% (from 226 respondents) and they no know them prevent from diabetes were 40.53% (from 154 respondents). Participants know to weight reduction prevent from diabetes were 88.68% (from 337 respondents) and they no know them prevent from diabetes were 11.32% (from 43 respondents).

Diabetes prevention methods	**Frequency**	**Percentage (%)**
Limited intake of fat in the diet/ regular physical activity		
Yes	336	88.42
No	44	11.58
Limited carbohydrates consumption		
Yes	336	88.42
No	44	11.58
Limited alcohol consumption in the diet		
Yes	226	59.47
No	154	40.53
Weight reduction		
Yes	337	88.68
No	43	11.32

Table 5:

Among the respondents, in complication, participants know to cardiovascular diseases such as heart attack happen from diabetes were 82.12% (from 312 respondents) and they no know them happen from diabetes were 17.89% (from 68 respondents). The respondents know to kidney diseases happen from diabetes were 81.05% (from 308 respondents) and they no know them happen from that were 18.92% (from 72 respondents). The respondents know to vision problem/loss of vision happen from diabetes were 83.68% (from 318 respondents) and they no know to them happen from that were 16.32% (from 62 respondents). The respondents know to limb amputation happen from diabetes were 77.89% (from 294 respondents) and they no know them happen from diabetes were 22.12% (from 84 respondents). The respondents know diabetic foot happen from diabetes were 82.89% (from 315 respondents) and they no know them happen from diabetes were 17.11% (from 65 respondents).

Complication of DM	**Frequency**	**Percentage (%)**
Cardiovascular diseases		
Yes	312	82.12
No	68	17.89
Kidney damage from diabetes		
Yes	308	81.05
No	72	18.92
Loss of vision		
Yes	318	83.68
No	62	16.32
Limb amputation		
Yes	296	77.89

No	84	22.12
Diabetic foot		
Yes	315	82.89
No	65	17.11

DISCUSSION

This study identified a relatively high prevalence of diabetes mellitus (29.47%), which is considerably higher than previously reported national data in Bangladesh (Sathi et al., 2022; Hossain et al., 2022). This variation may be explained by urban lifestyle factors, including reduced physical activity and increased consumption of processed foods (Ranasinghe et al., 2021; Ruze et al., 2023).

Although awareness of diabetes was high among participants, a significant gap between knowledge and actual preventive practices was observed. Similar findings have been reported in global studies highlighting poor translation of awareness into behavior (Ogurtsova et al., 2022).

Obesity and physical inactivity were identified as major risk factors in this study, which aligns with existing literature demonstrating their strong association with type 2 diabetes mellitus (Ruze et al., 2023; Lu et al., 2024).

The high prevalence observed in this study may also reflect increasing urbanization and epidemiological transition in Bangladesh, which has been widely reported in previous studies (Talukder & Hossain, 2020).

Furthermore, awareness of complications such as cardiovascular disease, kidney damage, and vision loss was relatively high, consistent with global evidence on the burden of diabetes-related complications (Tomic et al., 2022; Wright et al., 2019).

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