

## Research Article

### Screening of Diabetes Patterns among Patients of Rangpur Division

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#### Abstract

The increasing prevalence of diabetes and prediabetes in Bangladesh, particularly within urban centers such as Rangpur Division, reflects a growing public health crisis that demands urgent intervention. Community-based screening programs are essential for early detection, especially given the high proportion of undiagnosed cases across the country. A recent study conducted in the Dhap area of Rangpur City Corporation screened 70 individuals using fasting blood glucose (FBG), postprandial blood glucose (PPBG), and HbA1c levels to classify glycemic status into normal, prediabetic, or diabetic categories based on standard diagnostic criteria[1]. The findings revealed that the highest prevalence of diabetes was observed among individuals aged 40–49 and 50–59 years, indicating a trend toward earlier onset of type 2 diabetes mellitus (T2DM) compared to global patterns where peak incidence typically occurs at older ages.

Although there was a general increase in diabetes prevalence with advancing age, statistical analysis showed no significant association between age group and glycemic status ( $\chi^2 = 11.054$ ,  $df = 8$ ,  $p = 0.199$ ) [1]. This lack of significance may be attributed to the small sample size or heterogeneous risk exposure across age groups, but it also suggests that factors beyond chronological aging—such as lifestyle, diet, physical inactivity, and genetic predisposition—are playing a dominant role in disease development. These observations align with national data showing rising diabetes rates across all adult populations in Bangladesh. For instance, analyses of the Bangladesh Demographic and Health Survey (BDHS) indicate that the prevalence of diabetes among adults aged 35 years and older increased from 9.7% in 2011 to 13.7% in 2017–2018 [2]. More recent estimates suggest this upward trajectory has continued, highlighting an accelerating epidemic.

Urbanization is a key driver of this trend, contributing to sedentary behaviors, increased consumption of processed foods, and higher rates of overweight and obesity—all established risk factors for insulin resistance and hyperglycemia[3] [4]. Furthermore, regional disparities exist, with urban areas consistently reporting higher diabetes prevalence than rural regions [5]. In Rangpur City, rapid urban growth without parallel investments in public health infrastructure may exacerbate these risks, leading to clusters of undiagnosed and unmanaged cases.

## Keywords

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Diabetes, Screening, Prediabetes, Glycemic status, Rangpur Division

## 1. Introduction

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Diabetes is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from impaired insulin secretion, insulin action or both. The global prevalence of diabetes has increased substantially, particularly in low and middle-income countries undergoing rapid urbanization and lifestyle transitions. Bangladesh is experiencing a steady rise in diabetes prevalence, posing a significant public health challenge.

Early detection of diabetes and prediabetes is critical, as many affected individuals remain asymptomatic during the early stages of the disease. Delayed diagnosis increases the risk of complications such as cardiovascular disease, nephropathy, neuropathy and retinopathy. Community-based screening programs are an effective approach for identifying undiagnosed cases and populations at risk.

Rangpur Division, located in northern Bangladesh, has experienced notable socio-economic and urban development; however, region-specific data on glycemic status remain limited. The Dhap area of Rangpur City represents an urban population with diverse demographic characteristics and was therefore selected as the screening site. This study aims to assess the pattern of glycemic status among screened patients in Rangpur Division based on SPSS-analyzed data.

## 2. Objectives of the Study

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### 2.1. General Objective

To determine the pattern of glycemic status among screened patients in Rangpur Division.

### 2.2 Specific Objectives

- To determine the distribution of normal, prediabetic and diabetic individuals
- To assess age-wise variation in glycemic status

- To evaluate glycemic indicators including fasting blood glucose, postprandial blood glucose and HbA1c
- To generate baseline screening data for diabetes prevention strategies in Rangpur Division

## 3. Literature Review

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Previous studies have shown that a substantial proportion of diabetes cases remain undiagnosed, particularly in developing countries. Research from South Asia indicates a high prevalence of prediabetes, which significantly increases the risk of progression to diabetes. Urban studies in Bangladesh have reported higher diabetes prevalence compared to rural areas, largely attributed to sedentary lifestyle, dietary changes and obesity.

Despite these findings, northern Bangladesh remains underrepresented in published literature. Community-based screening studies are especially limited in Rangpur Division. This study contributes to filling that gap by providing SPSS-based evidence from a structured screening program.

## 4. Methodology

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### 4.1 Study Design

Cross-sectional community-based screening study.

### 4.2 Study Area

Dhap area, Rangpur City.

### 4.3 Study Population

Adults aged 18 years and above who voluntarily participated in the screening program.

### 4.4 Sample Size

A total of 70 participants were included in the final SPSS analysis.

### 4.5 Data Collection Tools

- Structured questionnaire
- Biochemical Test for fasting and postprandial blood glucose in the Laboratory
- Laboratory-based HbA1c testing

#### 4.6 Diagnostic Criteria

- Normal: Fasting blood glucose < 100 mg/dL and HbA1c < 5.7%
- Prediabetes: Fasting blood glucose 100-125 mg/dL or HbA1c 5.7-6.4%
- Diabetes: Fasting blood glucose  $\geq$  126 mg/dL or HbA1c  $\geq$  6.5%

#### 4.7 Ethical Considerations

Informed consent was obtained from all participants and confidentiality was maintained.

### 5. Results (SPSS-Based)

#### 5.1 Age-wise Distribution of Glycemic Status

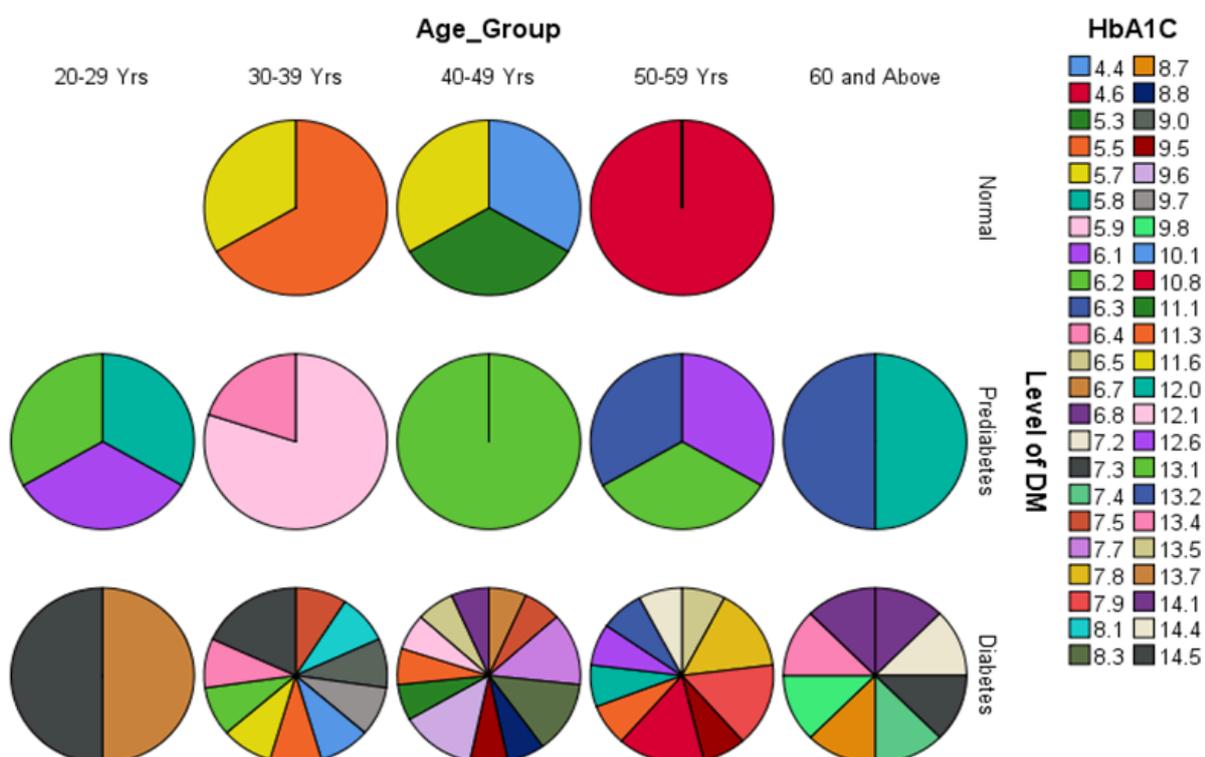
According to Table-1 & Table-2 SPSS cross-tabulation revealed variation in glycemic status across age groups. Diabetes was more frequently observed in middle-aged and older participants. The highest number of diabetic cases was found in the 40-49 years age group, followed by 50-59 years. Younger participants (20-29 years) showed a lower frequency of diabetes but still demonstrated the presence of prediabetes.

**Table 2**

**Level of DM \* Age Group Crosstabulation**

		Age Group					Total
		20-29 Yrs	30-39 Yrs	40-49 Yrs	50-59 Yrs	60 and above	
Level of DM	Normal	0	3	3	1	0	7
	Prediabetes	3	5	1	3	2	14
	Diabetes	2	11	15	13	8	49
Total		5	19	19	17	10	70

**Table 3**



## 5.2 Association Between Age Group and Glycemic Status

A chi-square test (Table 4) was conducted to assess the association between age group and glycemic status. The analysis showed no statistically significant association between age group and glycemic status ( $\chi^2 = 11.054$ ,  $df = 8$ ,  $p = 0.199$ ).

Although diabetes prevalence appeared to increase with age, the observed differences were not statistically significant at the 5% level.

**Table 5**

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.054 <sup>a</sup>	8	0.199
Likelihood Ratio	11.963	8	0.153
Linear-by-Linear Association	2.955	1	0.086
N of Valid Cases	70		

a. 11 cells (73.3%) have been expected to be countless than 5. The minimum expected count is .50.

## 6. Discussion

This study demonstrates a considerable burden of diabetes and prediabetes among screened individuals in Rangpur Division. The higher frequency of diabetes in middle-aged and older adults aligns with findings from other urban studies in Bangladesh. The absence of a statistically significant association between age group and glycemic status may be attributed to the relatively small sample size.

The detection of prediabetes in younger age groups is particularly concerning, as it indicates early metabolic risk. Community-based screening in urban settings such as Dhap can play a critical role in early identification and prevention.

## 7. Limitations of the Study

- Small sample size
- Screening conducted in a single urban area
- Cross-sectional design limits causal inference

## 8. Conclusion

The SPSS-based analysis reveals a substantial burden of diabetes and prediabetes among screened patients in Rangpur Division. Although age-related trends were observed, no statistically significant association was found. These findings highlight the importance of expanding community-level screening programs for early detection and diabetes prevention.

## 9. Recommendations

- Regular community-based diabetes screening programs
- Early intervention for individuals with prediabetes
- Integration of screening into primary healthcare services
- Larger studies including rural populations of Rangpur Division

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#### **Conflicts of Interest:**

The manuscript did not influence its scientific content, interpretation, or conclusions. The author and all coauthors confirm that they have no direct or indirect financial relationships that could be perceived as influencing the work reported in this manuscript.

#### **Additional Information**

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