

## Assessment of Depression, Anxiety and Stress among Patients with Type-II Diabetes Mellitus Study in a Bangladeshi Tertiary Care Hospital

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### Abstract

**Background:** Diabetes is a chronic disease caused by insufficient insulin production or ineffective insulin use. The global diabetes population is rapidly increasing, with over 70% living in developing countries. Anxiety and depression often coexist with diabetes, impacting treatment adherence and quality of life. People with diabetes are twice as likely to experience these mental health issues. Understanding and managing the emotional burden of diabetes is crucial for improving overall well-being and treatment outcomes.

**Aim of the Study:** This study aims to assess the mental health (Depression, anxiety and stress) of patients with Type II Diabetes Mellitus.

**Methods:** The study conducted at Khulna Medical College and Hospital lasted from 2022 to 2023, with 120 patients enrolled, all with a minimum 2-year history of type 2 diabetes mellitus. Inclusion criteria included patients over 20 years old and male and female patients with a specified diabetic history. Exclusion criteria involved patients with critical health conditions or communication difficulties. Data collection utilized structured and semi-structured questionnaires, as well as chart examinations. Statistical analysis was conducted using SPSS version 26.

**Result:** The study examined 120 patients, finding that those over 60 years old accounted for 48.33%, with 47.50% aged 40-60 and only 4.17% under 40. Most patients were male (59.17%) and urban residents (79.10%), with 74.17% literate. Mental health issues were prevalent, with 34.17% experiencing stress, 32.50% anxiety, and 33.33% depression. Severity varied: mild group (50% depression, 11.11% anxiety, 38.89% stress), moderate group (56.52% depression, 26.09% anxiety, 17.39% stress), severe group (5.56% depression, 38.89% anxiety, 55.56% stress), and very severe group (15% depression, 55% anxiety, 30% stress).

**Conclusion:** The study found high rates of depression, anxiety, and stress in Type II Diabetes Mellitus (T2DM) patients, with factors like age, gender, education, and location influencing mental health. Integrating psychological assessments and interventions into T2DM management, routine screening, and multidisciplinary approaches can improve treatment adherence and quality of life.

**Keywords:** Assessment, depression, anxiety, stress and Type-II DM.

### 1. INTRODUCTION

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use

the insulin it produces [1]. Insulin is a hormone that regulates blood glucose [2]. There are four types of diabetes: Type 1 diabetes is an autoimmune disease. The immune system

attacks and destroys cells in the pancreas, where insulin is made. It is unclear what caused this attack. Type 2 diabetes occurs when your body becomes resistant to insulin, and sugar builds up in your blood. It is the most common type, 90% to 95% Trusted Source of people living with diabetes have type 2 [3], Autoimmune diabetes in adults (LADA). It occurs during adulthood and sets in gradually, like type 2 diabetes. LADA is an autoimmune disease that cannot be treated by diet or lifestyle [4]. Gestational diabetes is high blood sugar during pregnancy [5]. Insulin-blocking hormones produced by the placenta cause this type of diabetes [6]. The number of people affected by diabetes worldwide is increasing rapidly. Currently, it is estimated that nearly 285 million individuals suffer from this condition, and it is projected that this number will increase to 438 million by 2030. More than 70% of people affected by diabetes live in developing countries. [7]. Anxiety and depression affect populations worldwide, but over two-thirds of those affected live in developing countries [8]. The coexistence of Type II Diabetes Mellitus (T2DM) and mental health disorders, specifically depression, anxiety, and stress, constitutes a multifaceted challenge that significantly impacts the well-being of affected individuals [9]. The demands of self-management, dietary restrictions, and potential complications associated with diabetes can lead to heightened levels of emotional distress due to its chronic nature [10]. When not adequately addressed, this emotional burden can adversely affect treatment adherence, glycemic control, and overall quality of life [11]. People with diabetes are almost twice as likely to suffer from anxiety and depression as the general population [12,13]. Recognizing the importance of understanding the psychological dimensions of diabetes, there has been a growing interest in assessing and addressing depression, anxiety, and stress in individuals with Type II Diabetes Mellitus [14]. Despite the evident significance of this interconnection, there remains a need for comprehensive studies that systematically assess the prevalence and impact of depression, anxiety, and stress among individuals with Type II Diabetes Mellitus [15]. This study aims to assess the mental health (Depression, anxiety and stress) of patients with Type II Diabetes Mellitus.

## **2. METHODOLOGY & MATERIALS**

This cross-sectional study was conducted at the Department of Medicine in Khulna Medical

College and Hospital. The study duration was one year, from 2022 to 2023. During the study period, 120 patients were enrolled and analyzed. All patients have at least a 2-year history of type 2 diabetes mellitus.

### **Inclusion Criteria**

- Patients aged more than 20 years.
- Both male and female.
- Patients with at least a 2-year history of type 2 diabetes mellitus.

### **Exclusion Criteria**

- Patients who had critical health conditions (uncertain prognosis, vital signs are unstable, there are major complications).
- Patients were unable to communicate properly.

Data collection involved conducting face-to-face interviews utilizing structured and semi-structured questionnaires and a thorough examination of patients' charts. Sociodemographic information of the participants was gathered through structured questionnaires, which were modified from various sources in the literature. All variables were categorical, with the exception of age, which was obtained through a closed-ended questionnaire format. Statistical analysis Analysis of data was performed using SPSS version 20.0. Categorical variables were expressed as percentages. Comparison between variables was done by using the chi-square test. Association between variables was considered statistically significant if the p-value was less than 0.05.

## **3. RESULT**

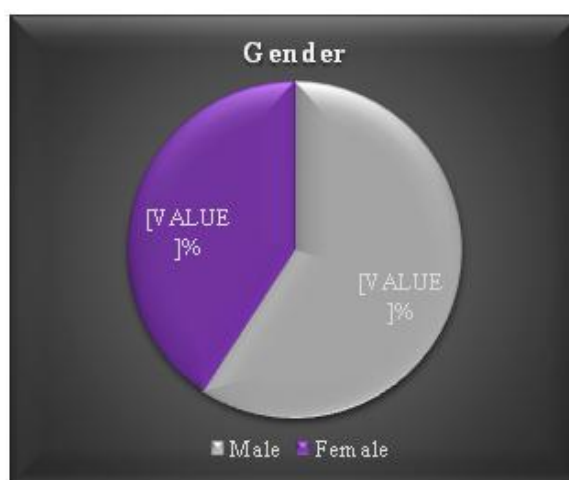
This cross-sectional study investigated a cohort of 120 patients, examining various demographic and health factors. The age distribution revealed that 48.33% of the patients were over 60, while 47.50% fell between 40 and 60 years, with only 4.17% under 40. The mean age was  $60.25 \pm 10.85$  years (Table 1). Gender distribution showed a majority of males (59.17%) compared to females (40.83%) (Figure 1). According to Table 2, urban residents comprised 79.10% of the sample, with rural residents comprising 20.83%. Regarding education in Table 3, 74.17% of patients were literate, while 25.83% were illiterate. Analysis of mental health indicators revealed that 34.17% suffered from stress, 32.50% from anxiety, and

33.33% from depression (Table 4). Table 5 presents data on the prevalence of depression, anxiety, and stress across different severity levels among individuals. The severity levels are categorized as mild, moderate, severe, and very severe. In the mild group, comprising 18 individuals, 50.00% reported depression, 11.11% reported anxiety, and 38.89% reported stress. In the moderate group (N=46), 56.52%

reported depression, 26.09% reported anxiety, and 17.39% reported stress. Among those classified as severe (N=36), only 5.56% reported depression, 38.89% reported anxiety, and 55.56% reported stress. Lastly, in the very severe group (N=20), 15.00% reported depression, 55.00% reported anxiety, and 30.00% reported stress.

**Table 1.** Age distribution of the study population (N=120).

Age groups in years	Frequency (n)	Percentage (%)
20-40	5	4.17
40-60	57	47.50
>60	58	48.33
Mean±SD	60.25± 10.85	



**Figure 1.** Gender distribution of the study population (N=120).

**Table 2.** Resident area of the study population (N=120).

Resident	Frequency (n)	Percentage (%)
Urban	95	79.17
Rural	25	20.83
Total	120	100.00

**Table 3.** Education status of the study population (N=120).

Education	Frequency (n)	Percentage (%)
Illiterate	31	25.83
Literate	89	74.17
Total	120	100.00

**Table 4.** Prevalence of depression, anxiety and stress of the study population (N=120).

Variables	Frequency (n)	Percentage (%)
Depression	40	33.33
Anxiety	39	32.50
Stress	41	34.17
Total	120	100.00

**Table 5.** Comparing depression, anxiety and stress with grading.

Variables	Mild (N=18)		Moderate (N=46)		Severe (N=36)		Very severe (N=20)		Total	
	n	%	n	%	n	%	n	%	n	%
Depression	9	50.00	26	56.52	2	5.56	3	15.00	40	33.33
Anxiety	2	11.11	12	26.09	14	38.89	11	55.00	39	32.50
Stress	7	38.89	8	17.39	20	55.56	6	30.00	41	34.17

#### 4. DISCUSSION

This study assessed the depression, anxiety and stress among 120 patients with type 2 diabetes mellitus admitted to a hospital in Khulna, Bangladesh. Depression, anxiety and stress are high among the admitted patients suffering from type 2 diabetes mellitus. Many factors, such as age, current living status, and educational status, are associated with anxiety and depression. Our study scrutinized the age distribution of individuals with Type II Diabetes Mellitus, highlighting that 47.50% of participants were in the 40-60 age range, with almost all patients (48.33%) aged over 60, while the least patients of 4.17% belonged to the 20-40 age group. A parallel study on Type II Diabetes Mellitus by Sharma et al. exhibited similar age patterns, with 47.3% falling in the 40-60 age range and 48.6% aged 60 and above [16]. Nigussil's study demonstrated a broader age range distribution, with the majority falling between 40 and 69 years [17]. These consistent findings across studies reinforce the notion that individuals aged 40 and above are more susceptible to Type II Diabetes Mellitus. In our study, the gender distribution indicates that 59.17% of participants identify as male, while 40.83% identify as female. This gender distribution is consistent with Abualhamael et al. 's study, which demonstrated a more pronounced gender disparity, with 65.7% males and 34.3% females [18]. In contrast to our study, Sharma et al. reported a slightly higher percentage of females (59.5%) compared to females (40.5%) [16]. The unity in gender distribution across these studies underscores a consistent pattern, suggesting that gender ratios in the context of mental health and Type II Diabetes Mellitus are relatively comparable across different populations. In our study, the residential distribution among participants reveals a substantial urban predominance, with 79.17% residing in urban areas and only 20.83% in rural settings. This contrasts with the findings from Sharma et al.'s study, where the urban-resident proportion was 68.6%, and rural residents constituted 31.4% [16]. This urban-centric demographic aligns with the findings from our investigation, emphasizing a concentration of individuals with Type II Diabetes Mellitus in urban settings. Cross-referencing these results with similar investigations could offer a broader understanding of regional variations and their potential impact on mental health outcomes in

individuals with Type II Diabetes Mellitus. Abualhamael et al.'s study demonstrated a diverse educational distribution, with varying levels of formal education among participants, including secondary education (17.9%) and higher education qualifications such as bachelor's degrees (38.2%), master's degrees (8.0%), Ph.D. (6.4%), and diplomas (17.1%) [18]. In contrast, our study presents a simpler classification, with 74.17% of participants considered literate and 25.83% classified as illiterate. In our study, the prevalence of depression, anxiety and stress was 33.33%, 32.5% and 34.17%, respectively, which is comparable with 11.5%, 30.5% and 12.5% among type II diabetic outpatients in Klang Valley, Malaysia [19]. In a similar study done in Pulau Penang and Melange of Malaysia, the prevalence was 26.6%, 40% and 19.4%, respectively [20]. For depression, our findings indicate that 50.00% of cases fall into the mild category, 56.52% are classified as moderate, 5.56% as severe, and 15.00% as very severe, contributing to an overall depression prevalence of 33.33%. A study in Saudi Arabia reported rates of mild, moderate, severe, and extremely severe depression among patients with type 2 DM as 9.3%, 14.0%, 7.1%, and 3.3%, respectively [21]. Another study found that 12.4% of participants experienced mild depression, 29.7% had moderate depression, 3.4% had severe depression, and 4.2% had very severe depression, resulting in an overall depression prevalence of 49.7% [22]. In terms of anxiety, 11.11% are categorized as mild, 26.09% as moderate, 38.89% as severe, and 55.00% as very severe, resulting in an overall anxiety prevalence of 32.50% according to our study. In the same line, a study in Saudi Arabia showed mild, moderate, severe and extremely severe anxiety among 13.4, 13.0%, 6.0%, and 5.8% of patients with type 2 DM, respectively [21]. However, a very low prevalence of anxiety was observed in other studies conducted in 15 nations and in the United States, Baltimore, which showed 18.0% and 21.8% overall prevalence of anxiety, respectively, among type 2 diabetes patients [23,24].

Lastly, the distribution for stress shows 38.89% in the mild category, 17.39% in the moderate range, 55.56% as severe, and 30.00% as very severe, contributing to an overall stress prevalence of 34.17% in our study. A similar study reported that their distribution indicates



11.0% with mild stress, 18.6% with moderate stress, 27.6% with severe stress, and 11.0% with severe stress, resulting in an overall stress prevalence of 68.3% [22]. The variation in the results might be due to the nature of the patients included in these studies and their different socio demographic characteristics and measurement tools.

**Limitations of the Study:** The study's sample size of 120 patients from a single Khulna, Bangladesh hospital may not represent the broader population of individuals with Type II Diabetes Mellitus. The findings may not generalise to other settings or populations with different demographic characteristics and healthcare systems. Moreover, the exclusion of patients with critical health conditions may have biased the results, as these individuals may experience higher levels of depression, anxiety, and stress. Finally, the assessment of depression, anxiety, and stress relied on self-report measures, which may be subject to social desirability bias and may not accurately reflect patients' mental health status.

## 5. CONCLUSION AND RECOMMENDATIONS

In conclusion, our study highlights a significant prevalence of depression, anxiety, and stress among patients with Type II Diabetes Mellitus (T2DM). Factors such as age, gender, educational status, and residential area show associations with mental health indicators. The high prevalence of these mental health disorders underscores the importance of integrating psychological assessments and interventions into the management of T2DM. Recommendations include routine screening for depression, anxiety, and stress in T2DM patients during clinical visits, as well as the implementation of multidisciplinary approaches involving healthcare providers, psychologists, and social workers to address the psychological well-being of individuals with T2DM. Early identification and management of mental health issues can improve treatment adherence, glycemic control, and overall quality of life for T2DM patients.

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