International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Research Article

Prevalence of Depression and Anxiety in Patients with Type 2 Diabetes Attending a Tertiary Care Hospital

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Received: 04-09-2025
Accepted: 25-09-2025
Available online: 05-10-2025

ABSTRACT

Background: Depression and anxiety are common yet under-recognized psychological comorbidities among patients with type 2 diabetes mellitus (T2DM). Their coexistence adversely affects glycemic control, treatment adherence, and overall quality of life. This study aimed to assess the prevalence of depression and anxiety and their association with clinical and sociodemographic factors in patients with T2DM attending a tertiary care hospital.

Material and Methods: A cross-sectional study was conducted among 200 adults with T2DM attending the outpatient clinic of a tertiary care teaching hospital from January to June 2025. Depression and anxiety were evaluated using the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) scales, respectively. Sociodemographic and clinical data were recorded using a structured questionnaire. Associations were analyzed using the chi-square test or Fisher's exact test as appropriate, with $p < 0.05$ considered statistically significant.

Results: The mean age of participants was 54.6 ± 9.2 years, with males comprising 54%. Most patients (41%) had diabetes for 6–10 years, and 71% showed suboptimal glycemic control (HbA1c ≥7%). Clinically significant depression (PHQ-9 ≥10) and anxiety (GAD-7 ≥10) were observed in 31% and 30% of patients, respectively. Higher rates of both conditions were noted among those with diabetes duration >10 years, HbA1c >9%, and presence of complications. Significant associations were found between depression and duration of diabetes ($p = 0.018$), glycemic control ($p = 0.007$), and complications ($p = 0.025$); similar associations were observed for anxiety ($p = 0.041$, 0.011, and 0.031, respectively).

Conclusion: Depression and anxiety are prevalent among patients with T2DM and correlate with disease duration, poor glycemic control, and diabetic complications. Incorporating routine psychological screening into diabetes management may enhance overall clinical outcomes.

Keywords*: Type 2 diabetes mellitus, Depression, Anxiety, Glycemic control*

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is a prevalent chronic condition globally, with India being one of the countries with the highest burden [1]. The coexistence of mental health disorders, particularly depression and anxiety, among individuals with T2DM has garnered increasing attention due to their impact on disease management and quality of life.

Recent studies have reported varying prevalence rates of depression and anxiety among T2DM patients. In India, a study by Tripathi et al. found that depression and anxiety were present in 20.3% and 17.3% of T2DM patients, respectively, with key predictors including female gender, obesity, unmarried marital status, poor glycemic control, and the presence of comorbid conditions [1]. Another study by Subramanian et al. observed even higher rates, with 65.3% of patients experiencing depression and 62.4% reporting anxiety [2].

The relationship between T2DM and mental health disorders is bidirectional. Depression and anxiety can exacerbate the challenges of managing diabetes, leading to poor glycemic control and increased risk of complications [3]. Conversely, the chronic nature of T2DM and its complications can contribute to the development or worsening of mental health issues [4-6].

Given the significant impact of depression and anxiety on the management and outcomes of T2DM, it is crucial to assess their prevalence and associated factors in this population. This study aims to determine the prevalence of depression and anxiety among patients with T2DM attending a tertiary care hospital and to explore their association with clinical and sociodemographic factors.

MATERIAL AND METHODS

Study Design and Setting: This study was conducted from Jan 2025 to June 2025 in Kamla Nehru Hospital, Mangalwar peth ,Pune , Maharashtra . The study aimed to determine the prevalence of depressive and anxiety symptoms among individuals diagnosed with T2DM.

Study Population and Sample Size: A total of 200 adult patients with confirmed T2DM attending the outpatient diabetic clinic during the study period were enrolled using a systematic random sampling technique. The sample size was calculated considering an expected prevalence of depression among diabetic patients of approximately 40%, with a 95% confidence interval and 7% margin of error, yielding a minimum required sample of 188, which was rounded to 200 to account for potential non-response.

Inclusion Criteria

- Adults aged 30–70 years with a confirmed diagnosis of T2DM for at least one year.
- Patients willing to provide written informed consent.

Exclusion Criteria

- Individuals with a known history of psychiatric illness prior to the diagnosis of diabetes.
- Patients with acute medical conditions, chronic debilitating illnesses, or cognitive impairment.
- Patients on antidepressant or anxiolytic medication.

Data Collection Procedure: Participants were recruited during their routine outpatient visits. Demographic data (age, gender, occupation, education level, socioeconomic status) and clinical information (duration of diabetes, treatment type, presence of diabetic complications, and comorbidities) were recorded using a structured questionnaire.

Assessment Tools: Psychological assessment was performed using two standardized, validated scales:

1. **Patient Health Questionnaire-9 (PHQ-9)** – to assess depressive symptoms. A score of ≥10 was considered indicative of clinically relevant depression [7].
2. **Generalized Anxiety Disorder-7 (GAD-7)** – to evaluate anxiety levels, with a score of ≥10 suggesting significant anxiety symptoms [8].

Both tools were administered in the local language by trained investigators under supervision, ensuring clarity and consistency. Scores were categorized into mild, moderate, and severe based on established cut-offs.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 25.0. Descriptive statistics were used to summarize sociodemographic and clinical variables. The prevalence of depression and anxiety was expressed as percentages. Associations between psychological morbidity and independent variables (age, gender, duration of diabetes, glycemic control, and complications) were analyzed using the chi-square test. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 200 patients with type 2 diabetes mellitus were included in the present study. The mean age of the participants was 54.6 ± 9.2 years, with the majority belonging to the 50–59 years (34%) and ≥60 years (32%) age groups. Males constituted 54% of the study population, and females 46%. Most of the participants were married (89%), and nearly equal proportions had completed secondary education (42%) or were graduates (42%). Regarding socioeconomic background, more than half of the subjects (54%) belonged to the middle-income group, followed by 22% from the lower and 24% from the upper socioeconomic strata (Table 1).

The duration of diabetes among the participants ranged from 1 to 18 years, with a mean duration of 8.2 ± 4.5 years. Approximately 41% of patients had diabetes for 6–10 years, while 28% had been diagnosed for more than 10 years. The majority (61%) were receiving oral hypoglycemic agents (OHA) alone, 21% were on insulin monotherapy, and 18% were receiving a combination of both. Based on HbA1c values, 29% achieved good glycemic control (<7%), 46% had fair

control (7–9%), and 25% had poor control (>9%). Diabetic complications were present in 52% of patients, with neuropathy (18%), retinopathy (14%), and nephropathy (11%) being the most common. Multiple complications were observed in 9% of cases (Table 2).

According to the PHQ-9 scale, 31% of patients exhibited clinically significant depressive symptoms (score ≥10). Among them, 19% had moderate, 9% had moderately severe, and 3% had severe depression. Mild depressive symptoms were present in 26%, while 43% reported minimal or no depressive features. Assessment with the GAD-7 scale showed that 30% of patients experienced significant anxiety (score ≥10). Of these, 20% had moderate and 10% had severe anxiety. Mild anxiety symptoms were noted in 23%, whereas 47% demonstrated minimal or no anxiety (Table 3).

Overall, the co-occurrence of both depression and anxiety was identified in approximately 22% of participants. A higher prevalence of depression and anxiety was observed among female patients (34.8% and 34.7%, respectively) compared to males (27.8% and 25.9%), though the difference was not statistically significant ($p > 0.05$). The occurrence of both conditions increased significantly with longer diabetes duration ($p = 0.018$ for depression; $p = 0.041$ for anxiety) and poor glycemic control ($p = 0.007$ and $p = 0.011$, respectively). Patients with one or more diabetic complications were significantly more likely to experience depression ($p = 0.025$) and anxiety ($p = 0.031$) compared to those without complications (Table 4, Figure 1).

Table 1: Sociodemographic Profile of Study Participants (n = 200)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	30–39	22	11.0
	40–49	46	23.0
	50–59	68	34.0
	≥60	64	32.0
Gender	Male	108	54.0
	Female	92	46.0
Marital status	Married	178	89.0
	Unmarried/Widowed/Separated	22	11.0
Education	Illiterate	32	16.0
	Up to Secondary	84	42.0
	Graduate and above	84	42.0
Socioeconomic status	Lower	44	22.0
	Middle	108	54.0
	Upper	48	24.0

Table 2: Clinical Characteristics of Patients with Type 2 Diabetes (n = 200)

Variable	Category	Frequency (n)	Percentage (%)
Duration of diabetes (years)	1–5	62	31.0
	6–10	82	41.0
	>10	56	28.0
Treatment type	Oral hypoglycemic agents (OHA)	122	61.0
	Insulin only	42	21.0
	OHA + Insulin	36	18.0
Glycemic control (HbA1c)	<7%	58	29.0
	7–9%	92	46.0
	>9%	50	25.0
Presence of complications	None	96	48.0
	Retinopathy	28	14.0
	Neuropathy	36	18.0
	Nephropathy	22	11.0
	Multiple complications	18	9.0

Table 3: Prevalence and Severity of Depression and Anxiety among Study Participants

Parameter	Category	Frequency (n)	Percentage (%)
Depression (PHQ-9)	None/Minimal (0–4)	86	43.0
	Mild (5–9)	52	26.0
	Moderate (10–14)	38	19.0
	Moderately severe (15–19)	18	9.0
	Severe (≥20)	6	3.0
Overall prevalence of depression	(PHQ-9 ≥10)	62	**31.0**

Anxiety (GAD-7)	None/Minimal (0–4)	94	47.0
	Mild (5–9)	46	23.0
	Moderate (10–14)	40	20.0
	Severe (≥15)	20	10.0
Overall prevalence of anxiety	(GAD-7 ≥10)	60	**30.0**

Table 4: Association of Depression and Anxiety with Clinical Variables

Variable	Category	Depression Present (%)	Anxiety Present (%)	*p*-value (Depression)	*p*-value (Anxiety)
Gender	Male	27.8	25.9	0.312	0.224
	Female	34.8	34.7		
Duration of diabetes (years)	1–5	19.4	17.7	0.018*	0.041*
	6–10	34.1	30.5		
	>10	42.8	39.2		
Glycemic control (HbA1c)	<7%	17.2	15.5	0.007*	0.011*
	7–9%	33.7	31.5		
	>9%	44.0	40.0		
Presence of complications	None	23.9	22.9	0.025*	0.031*
	One or more	38.5	36.9		

*Statistically significant ($p < 0.05$)

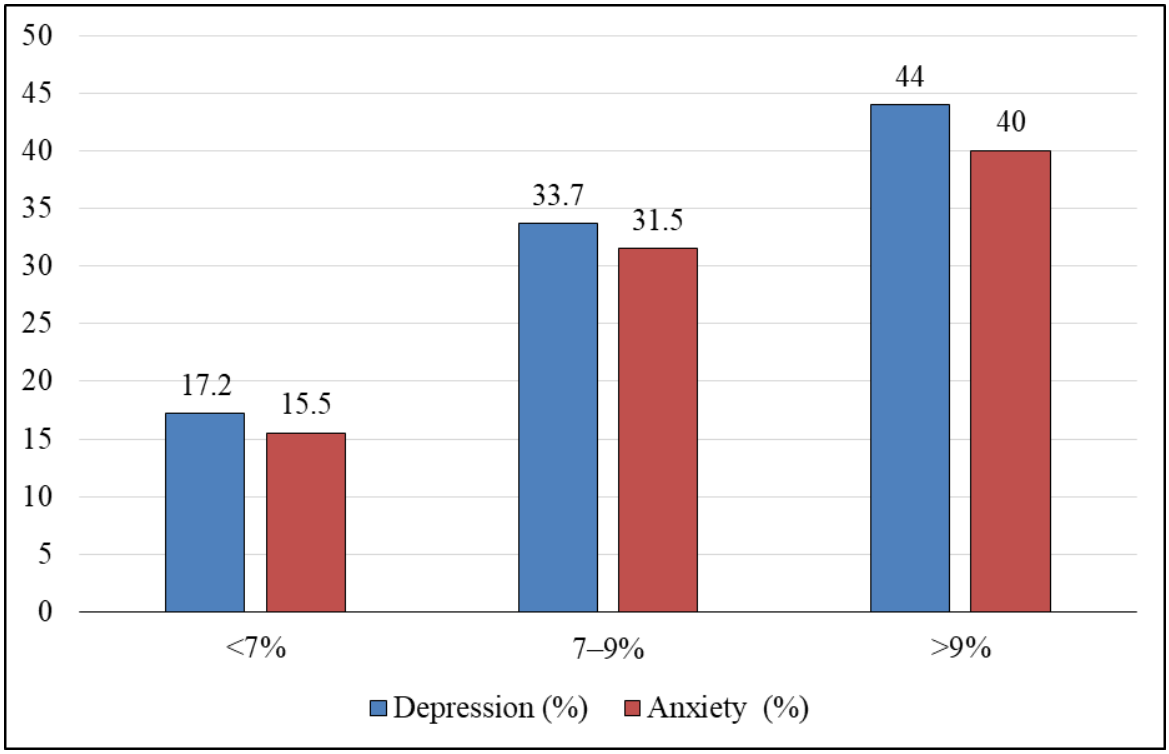

Figure 1: Distribution of Depression and Anxiety with HbA1c

DISCUSSION

Our study found a notably high prevalence of depression (31%) and anxiety (30%) among patients with type 2 diabetes mellitus (T2DM), which is consistent with observations from previous studies conducted both in India and internationally. For example, a study by Tripathi et al. reported a prevalence of 20.3% for depression and 17.3% for anxiety among T2DM patients in India [1]. Similarly, Subramanian et al. observed even higher rates, with 65.4% of patients exhibiting depression and 62.4% experiencing anxiety [2]. These variations across studies may be attributed to differences in study populations, diagnostic criteria, socio-economic factors, and methodological approaches, highlighting the complex and multifactorial nature of psychological comorbidities in diabetes.

The link between depression, anxiety, and suboptimal glycemic control in T2DM patients is well-established. A meta-analysis by Nguyen et al. demonstrated that depression is significantly associated with poor glycemic control in adults with

diabetes in low- and middle-income countries, showing an odds ratio of 2.01 [9,10]. Additionally, Kamruzzaman et al. reported that depressive symptoms were strongly correlated with worse glycemic control in T2DM patients, indicating that psychological distress may contribute to challenges in diabetes self-management and adherence to treatment regimens [11,12].

In our study, we also observed significant associations between the presence of depression and anxiety with a longer duration of diabetes and the existence of diabetic complications. These findings are in agreement with those reported by Sendekie et al., who found that psychological distress is linked to both poor glycemic control and the presence of complications in T2DM patients [13,14]. This suggests that prolonged disease burden and the experience of complications may exacerbate mental health issues, creating a bidirectional relationship that can adversely impact disease management. The high prevalence of depression and anxiety observed in our cohort emphasizes the critical need for integrated mental health care within the management framework of T2DM. Systematic screening for psychological comorbidities and timely interventions—such as counseling, cognitive-behavioral therapy, and appropriate pharmacological treatment—may not only improve glycemic control but also enhance overall quality of life, adherence to therapy, and long-term clinical outcomes for patients with T2DM..

CONCLUSION

Depression and anxiety were prevalent among patients with type 2 diabetes, affecting nearly one-third of the study population. Their occurrence was significantly associated with longer disease duration, poor glycemic control, and diabetic complications. Regular mental health screening and timely psychological support should be incorporated into routine diabetes care to improve overall outcomes.

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