MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.9.624.627

Assessment of Depression Levels in Diabetic Patients: A Cross-Sectional Study

[1]Rajesh Ram, [2]Devendra Chaudhari, [3]Shruti Dalpatbhai Kalola and [4]Sahil Purushottambhai Patel

[1]Department of Psychiatry, Shantaba Medical Collage, Amreli, Gujarat, India
[2]Department of Psychiatry, Banas Medical College and Research Institute, Palanpur, Gujarat, India
[3]CHC Dhrol, Gujrat, India
[4]CHC Dingucha, Gujarat, India

OPEN ACCESS

Key Words
Depression, diabetes mellitus, beck depression inventory

Corresponding Author
Sahil Purushottambhai Patel,
CHC Dingucha, Gujarat, India
sahilpatel150501@gmail.com

Author Designation
[1]Assistant Professor
[2]Associate Professor
[3,4]Medical Officer

Received: 10 August 2024
Accepted: 11 September 2024
Published: 16 September 2024

Citation: Rajesh Ram, Devendra Chaudhari, Shruti Dalpatbhai Kalola and Sahil Purushottambhai Patel, 2024. Assessment of Depression Levels in Diabetic Patients: A Cross-Sectional Study. Res. J. Med. Sci., 18: 624-627, doi: 10.36478/makrjms.2024.9.624.627

ABSTRACT
Diabetes mellitus is a chronic metabolic disorder marked by complex disruptions in the body's ability to regulate the metabolism of lipids, carbohydrates and proteins, leading to persistent hyperglycemia. A growing body of evidence suggests that individuals with diabetes are at an increased risk of developing psychiatric disorders, particularly depression, which further exacerbates the disease burden and affects quality of life. This study aimed to evaluate the occurrence of depression among individuals with diabetes. The study included 178 patients diagnosed with diabetes mellitus, representing both male and female participants. Participants were recruited based on predefined inclusion and exclusion criteria to ensure a representative sample. The level of depression among these individuals was assessed using the Beck Depression Inventory-II (BDI-II). Data were collected and analyzed to explore the correlation between diabetes and depression in this cohort. Out of 178 participants, 98 were male and 80 female. Marital status was 66.9% married, 8.99% unmarried and 24.2% divorced or widowed. A family history of diabetes was reported in 41.6% of participants. Diabetes duration was under 5 years for 8.43%, 5-10 years for 26.97% and 10-15 years for 64.61%. Fasting blood glucose levels were below 110 mg/dl in 1.12%, between 110-125 mg/dl in 7.87% and above 125 mg/dl in 91.01%, with significant differences. The Beck Depression Inventory indicated 33.71% with minimal depression, 7.87% with mild, 28.64% borderline, 24.16% moderate and 5.62% severe depression, also showing significant differences. Considerable proportion of patients with type II diabetes exhibited depressive symptoms, necessitating thorough evaluation, especially in those with long-standing diabetes.

INTRODUCTION

Diabetes mellitus is a long-term metabolic disorder characterized by irregularities in the metabolism of lipids, carbohydrates and proteins. These disturbances arise due to either insufficient insulin production or reduced cellular sensitivity to insulin action[1]. It is a condition that has the potential to reach pandemic levels and poses a significant threat to public health in the 21st century. It is estimated that between 8% and 15% of the urban population in India is affected by Type 2 diabetes mellitus (T2DM), with a projected increase over time[2]. Depression, a condition affecting approximately 350 million individuals worldwide, is also widespread. If left untreated, it can evolve into a serious medical issue, especially when it is persistent and moderate to severe in intensity. Those affected often experience substantial emotional distress and a decline in performance in professional, educational, and familial settings. Depression is frequently encountered among individuals with diabetes mellitus[3,4].

The coexistence of depression and severe psychological stress with T2DM is common and is associated with reduced adherence to medication, poor lifestyle choices, impaired glycemic control and increased complications[5,6]. Both T2DM and depression are significant public health challenges, with over 365 million people worldwide estimated to have T2DM, and nearly 300 million individuals living with major depression. By 2030, these conditions are anticipated to rank among the top five contributors to the global burden of disease[7]. Depression has been recognized as a modifiable independent risk factor for the development of T2DM and for the progression of complications in both type 1 and type 2 diabetes. Early identification and management of this relationship can have a profound impact on prevention and treatment strategies[8]. The current study was conducted to evaluate the prevalence of depression among individuals with diabetes.

MATERIALS AND METHODS

The current study involved 178 diabetic patients of both sexes. All participants were informed about the study and their written consent was secured. Relevant data, including name, age and other demographic details, were collected. Information related to diabetes included body mass index (BMI), duration of the disease, type and length of treatment, diabetes-related complications and family history of diabetes. The level of glycemic control was assessed through fasting and postprandial blood glucose levels, along with HbA1c values. Medication adherence was measured using the eight-item Morisky Medication Adherence Scale (MMAS-8)[9] and depression was evaluated using the Beck Depression Inventory (BDI-II)[10]. The collected data underwent statistical analysis using GraphPad software and a $P<0.05$ was considered statistically significant.

RESULTS AND DISCUSSIONS

Among the 178 study participants, there were 98 males and 80 females. The distribution of marital status was as follows. 66.9% were married, 8.99% were unmarried and 24.2% were either divorced or widowed. A family history of diabetes was reported by 41.6% of the participants. Diabetes duration was categorized as follows <5 years for 8.43%, between 5 and 10 years for 26.97% and between 10 and 15 years for 64.61% of the participants. Fasting blood glucose levels were recorded as below 110 mg/dl in 1.12%, between 110-125 mg/dl in 7.87% and above 125 mg/dl in 91.01% of the patients. The observed differences were statistically significant (Table 1),

Table 1: Baseline Variables in Study Population

Variables	n	%	p-value
Gender			
Male	98	55.1	0.056
Female	80	44.9	
Marital Status			
Married	119	66.9	<0.05
Unmarried	16	8.99	
Divorced/Widow	43	24.2	
Family History of Diabetes			
Present	74	41.6	<0.05
Absent	104	58.4	
Duration of Diabetes			
<5 years	15	8.43	<0.05
5-10 years	48	26.97	
10-15 years	115	64.61	
Fasting Blood Sugar			
<110 mg/dl	2	1.12	<0.05
110-125 mg/dl	14	7.87	
>125 mg/dl	162	91.01	

The Beck Depression Inventory (Table 2) revealed that 33.71% participants had minimal depression, 7.87% had mild depression, 28.64% were borderline, 24.16% had moderate and 5.62% had severe depression, with significant differences ($P < 0.05$).

Table 2: BDI-II Findings in Study Population

Grades of Depression	n	%	p-value
Minimal	60	33.71	<0.01
Mild	14	7.87	
Borderline	51	28.65	
Moderate	43	24.16	
Severe	10	5.62	

Depression can be regarded as a modifiable independent risk factor for both the onset of Type 2 diabetes and the progression of complications in both Type 1 and Type 2 diabetes. Recognizing and managing

this association could significantly impact the prevention and treatment of these conditions. Approximately 80% of individuals with Type 2 diabetes reside in low-and middle-income countries (LMICs)[11,12]. However, a substantial portion of research on depression among diabetic patients has been conducted in high-income countries (HICs). Depression is commonly observed alongside diabetes and is associated with negative outcomes. Nonetheless, there is limited data from India on this critical relationship[13]. Research into the prevalence of depression among diabetic patients is particularly relevant in India, a middle-income country where both conditions are highly prevalent. Given the significant rates of both depression and diabetes in India, studying this relationship is crucial for the population. Evidence has demonstrated a link between depression and diabetes[14]. The current study aimed to evaluate the prevalence of depression among individuals with diabetes.

In our study, we included 178 patients, consisting of 98 males and 80 females. Simon[15] investigated the prevalence of depression among patients with Type 2 diabetes. Their findings indicated that the majority of potential depression cases (33%) were in the age group of 51-60 years, with 62% being male. Most patients (40%) were also within the 51-60 years age range, and 73.4% of married patients were identified as potential cases of depression. Additionally, 78% of the patients had a family history of Type 2 diabetes mellitus and 72% were either overweight or obese (BMI >25 kg/m²). In our study, marital status was as follows. 119 patients were married, 16 were unmarried and 43 were divorced or widowed. A family history of diabetes was present in 74 patients. The duration of diabetes was less than 5 years for 15 patients, between 5 and 10 years for 48 patients and between 10 and 15 years for 115 patients. Fasting blood sugar levels were <110 mg/dl for 2 patients, 110-125 mg/dl for 14 patients, and >125 mg/dl for 162 patients. Knol[16] found various risk factors associated with depression among elderly individuals. In their study of 240 elderly persons using a pretested and designed GDS-30 questionnaire, they found a 26.6% prevalence of depression, with 18% having mild depression and 8.3% experiencing severe depression. Depression was more common among those who were physically inactive (48.27%) compared to those who were active (14.37%). Additionally, 26.41% of illiterates were depressed, compared to 24.7% of literate individuals, highlighting a significant association between illiteracy and depression. Significant associations were also observed between age-related morbidities, such as neurological and locomotor disorders and depression.

In our findings, Beck's Depression Inventory results were as follows: minimal in 60 cases, mild in 14 cases, borderline in 51 cases, moderate in 43 cases and severe in 10 cases. Frederick[17] reported that their study participants were predominantly Indo-Trinidadian (49%), over 50 years old (79.7%) and female (60%). The prevalence of depression among Type 2 diabetic patients was 17.9%, with mild to moderate depression levels. Female Type 2 diabetics had higher depression scores (M=42.13, SD=9.83, p=0.011) compared to males (M=38.71, SD=8.9). Patients with additional medical complications had higher depression scores (M=44.01, SD=9.52) compared to those with diabetes alone (M=37.74, SD=8.79, p=0.000).

CONCLUSION

The authors identified a notably high prevalence of depression in patients diagnosed with type II diabetes mellitus. This finding underscores the critical need for comprehensive mental health assessments in this population, especially in individuals with a prolonged duration of the disease. The chronic nature of diabetes and its associated physiological and psychological burdens likely contribute to the increased risk of depression. As a result, timely and systematic psychological evaluation should be integrated into routine diabetes management protocols, with particular emphasis on patients with long-standing diabetes, to facilitate early intervention and improve overall outcomes.

REFERENCES

1. Talbot, F. and A. Nouwen, 2000. A review of the relationship between depression and diabetes in adults: Is there a link? Diabetes Care, 23: 1556-1562.
2. Lustman, P.J., R.J. Anderson, K.E. Freedland, M. de Groot, R.M. Carney and R.E. Clouse, 2000. Depression and poor glycemic control: A meta-analytic review of the literature. Diabetes Care, 23: 934-942.
3. Srivastav, P., 2022. Assessment of depression amongst diabetics. Int J Life Sci Biotech Pharma Res., 11: 196-199.
4. Schram, M., C. Baan and F. Pouwer, 2009. Depression and quality of life in patients with diabetes: A systematic review from the European depression in diabetes (edid) research consortium. Curr. Diabetes Rev., 5: 112-119.
5. Shaban, M.C., J. Fosbury, D. Kerr and D.A. Cavan, 2006. The prevalence of depression and anxiety in adults with type 1 diabetes. Diabetic Med., 23: 1381-1384.

6. Simon, G.E., W.J. Katon, E.H.B. Lin, C. Rutter and W.G. Manning et al., 2007. Cost-effectiveness of systematic depression treatment among people with diabetes mellitus. Arch. Gen. Psychiatry, 64: 65-72.
7. Knol, M.J., J.W.R. Twisk, A.T.F. Beekman, R.J. Heine, F.J. Snoek and F. Pouwer, 2006. Depression as a risk factor for the onset of type 2 diabetes mellitus. a meta-analysis. Diabetologia, 49: 837-845.
8. Beck, A.T., R.A. Steer and G.K. Brown, 1996. Beck Depression Inventory.
9. Las, C.C.D. and W. Peñate, 2015. Psychometric properties of the eight-item morisky medication adherence scale (mmas-8) in a psychiatric outpatient setting. Int. J. Clin. Health Psychol., 15: 121-129.
10. Morisky, D.E., A. Ang, M. Krousel-Wood and H.J. Ward, 2008. Retracted: Predictive validity of a medication adherence measure in an outpatient setting. J. Clin. Hypertens., 10: 348-354.
11. Silva, N.D.L., M.P. Lam, C.N. Soares, D.P. Munoz, R. Milev and F.G.D. Felice, 2019. Insulin resistance as a shared pathogenic mechanism between depression and type 2 diabetes. Front. Psychiatry, Vol. 10 .10.3389/fpsyt.2019.00057.
12. Kaveeshwar, S.A. and J. Cornwall, 2014. The current state of diabetes mellitus in India. Australas Med J., 7: 45-48.
13. Wu, Y., Y. Ding, Y. Tanaka and W. Zhang, 2014. Risk factors contributing to type 2 diabetes and recent advances in the treatment and prevention. Int. J. Med. Sci., 11: 1185-1200.
14. Frederick, F. and H. Maharajh, 2013. Prevalence of depression in type 2 diabetic patients in trinidad and tobago. West Indian Med. J., 62: 628-631.