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Prevalence of depression among diabetic patients attending outpatient and inpatient

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Abstract. *Diabetes mellitus* is a collection of metabolic illnesses characterised by persistent hyperglycemia, resulting in consequences affecting several organ systems. Depression is a common and impactful psychosocial condition in diabetic patients, further hindering glycemic control and negatively affecting overall health outcomes. The present study investigated the depression prevalence among *diabetes mellitus* patients in outpatient treatment and its impact on diabetes management. This hospital-based cross-sectional observational study was conducted over 18 months. A sample of 125 *diabetes mellitus* patients was selected based on a 9% prevalence rate with a 5% margin of error and a 95% confidence interval. Depression was evaluated via the 9-item Patient Health Questionnaire Depression Screening Tool. Clinical evaluation comprised HbA1c, fasting plasma glucose, and postprandial glucose measurements. Statistical analysis was conducted utilising SPSS software. The study determined that 29.6% of diabetic patients were diagnosed with depression, with varying degrees of severity. Depression was associated with poorer glycemic control, evidenced by significantly higher levels of HbA1c, fasting plasma glucose, and postprandial glucose. Patients with depression also had a higher prevalence of diabetes-related complications, such as nephropathy and neuropathy. The study concluded that depression is prevalent among patients with diabetes and has a significant impact on diabetes management. The practical value of this study is that integrated care, including screening and treatment of mental disorders, is crucial to the improvement of the outcomes of diabetes patients

Keywords: *diabetes mellitus*; glycemic control; hyperglycemia; diabetes complications

Introduction

Diabetes mellitus (DM) is a collection of metabolic illnesses marked by persistent hyperglycemia resulting from impaired insulin secretion, insulin action, or both. These metabolic abnormalities significantly impact the processing of carbohydrates, proteins, and fats, often accompanied by vascular damage, leading to complications affecting multiple organ systems, as highlighted by F.J. Snoek [1]. These complications, including cardiovascular disease,

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neuropathy, and retinopathy, are the leading causes of morbidity and mortality among individuals with diabetes, as noted by F.S. Yen *et al.* [2]. B.K. Jha *et al.* [3] noted that Type 2 *diabetes mellitus* (T2DM) is a major challenge due to the prolonged asymptomatic phase of hyperglycemia that precedes diagnosis, complicating the treatment of both glucose and insulin. Furthermore, B.K. Jha *et al.* [3] emphasised that the interplay between hyperglycemia and insulin resistance significantly increases the risk of cardiovascular diseases, contributing to the complexity of managing T2DM.

The high prevalence of depression among individuals with diabetes is a significant psychosocial aspect of diabetes management, as described by S. Akshatha & U.B. Nayak [4]. H. Abuhegazy *et al.* [5] reported that nearly one-third of T2DM patients experience depression. J.A. Agyekum *et al.* [6] determined that depression among diabetic patients is correlated with poor quality of life, a higher risk of complications, and inadequate glycemic control. S. Akshatha & U.B. Nayak [4] also noted that the burden of diabetes management, combined with the stigma and social challenges associated with chronic illnesses, increases the risk of depression.

P. Saeedi *et al.* [7] projected a 51% increase in the global prevalence of diabetes, rising from 9.3% in 2019 to 10.9% in 2045. P. Ranasinghe *et al.* [8] documented a dramatic rise in diabetes prevalence in India, increasing from 3.3 to 19% in urban areas and from 2.4 to 15% in rural areas between 1972 and 2015-2019. Furthermore, P. Ranasinghe *et al.* [8] emphasised that diabetes accounts for approximately 10% of global mortality and ranks as the fourteenth leading cause of disability-adjusted life years. D. Carrozzino *et al.* [9] highlighted the utility of the Hamilton Depression Rating Scale (HAMD) in assessing the severity of depressive symptoms among diabetic patients. Accurate assessment and timely intervention for depression in this population are crucial for improving overall health outcomes and quality of life.

Understanding the incidence and influence of depression among DM patients, particularly in India, is vital for the development of effective healthcare policies and interventions. This research aimed to explore the occurrence of depressive disorders among diabetic patients in outpatient settings in India to enhance mental health care integration into diabetes management protocols.

Materials and Methods

This hospital-based cross-sectional observational study was conducted over 18 months, with an additional 6 months allocated for thesis writing, at the Department of General Medicine and Department of Psychiatry, F.H. Medical College and Hospital. The study was conducted based on the 022 ADA criteria [10]. The sample size was determined to be 125 patients, calculated on a prevalence rate of 9%, with a 5% margin of error and a 95% confidence interval. Participants included patients with established DM who were willing to follow up for one year at six-month intervals. Exclusion criteria were strictly applied to ensure the focus on DM-related depression, excluding patients with uncontrolled hypertension, active infections, other chronic illnesses, or psychiatric conditions other than depression.

Data was gathered via organised face-to-face interviews conducted by trained healthcare professionals utilising standardised, validated questionnaires. The surveys comprised the Patient Health Questionnaire-9 (PHQ-9) [11] to screen for depression, along with additional demographic and clinical data. This approach ensured both reliability and consistency in the data collection process. Participants were followed up at 6-month intervals over the course of a year. During each follow-up, patients were re-evaluated using the PHQ-9 to monitor changes in depressive symptoms. Additional clinical parameters related to diabetes control, such as HbA1c levels, were also recorded. Criteria for ongoing participation included regular follow-up visits, adherence to prescribed treatment for DM, and completion of follow-up assessments. Participants were excluded from the study if two consecutive follow-up visits were missed.

Participant selection was accomplished using a convenience sample approach, with diabetic patients attending both outpatient and inpatient departments, used as the subject pool. This method was selected based on the availability of patients willing to participate and meet the inclusion criteria. Inclusion criteria consisted of patients with established DM as per ADA 2022 criteria [10], who were able to participate in follow-up for one year. Exclusion criteria included patients with uncontrolled hypertension, active infections, other chronic illnesses, or psychiatric conditions other than depression. Ethical clearance and informed consent were obtained before the study. The study was conducted per the Declaration of Helsinki [12] and was approved by the Institutional Ethics Committee of F.H. Medical College and Hospital. Informed permission was acquired from all individuals before their involvement in the study. The confidentiality of all participants was ensured during the testing, and patients retained the autonomy to withdraw at any time without repercussions on care.

The statistical analysis was conducted using SPSS software (SPSS Inc., Chicago, IL, USA), version 26.0, on the Windows platform. Descriptive statistics were employed to summarise socio-demographic, clinical, therapeutic, and lifestyle aspects. Frequencies and percentages were calculated for categorical data, whilst continuous variables were expressed as means and standard deviations. The chi-square test was used to assess the associations between categorical variables, including depression, and covariates such as gender, marital status, and employment status. Continuous variables, such as HbA1c, fasting plasma glucose, and postprandial glucose levels, were analysed between patients with and without depression utilising independent t-tests. To analyse the correlation between depression severity (measured by PHQ-9 scores) and glycemic control indicators, including HbA1c, fasting plasma glucose, and 2-hour postprandial glucose, alongside the duration of diabetes, correlation analyses were performed, employing Spearman's rank correlation and point-biserial correlation. A p-value below 0.05 was considered statistically significant for all analyses.

The accuracy of the estimates was demonstrated by the 95% confidence intervals for the correlation coefficients.

Results

This study provides a comprehensive analysis of the socio-demographic, clinical, treatment, and psychological profiles of diabetic patients, with a particular focus on the prevalence and severity of depression. Most participants were over 40 years old, with a slight predominance of males (56.8%) and a high proportion of married individuals (80.0%). Educational levels were varied, with nearly equal representation among university, secondary, and primary levels (Table 1).

Table 1. Socio-demographic data of the enrolled patients among the groups

	Frequency (n = 125)	Percentage (%)
Age		
18-40 years	8	6.4
>40 years	117	93.6
Mean ± SD	44.63±5.37	
Gender		
Male	71	56.8
Female	54	43.2
Marital status		
Married	100	80.0
Widow	16	12.8
Divorced	6	4.8
Single	3	2.4
Employment status		
Employed	28	22.4
Non-employed	55	44.0
Retired	42	33.6
Education level		
University	35	28.0
Secondary	35	28.0
Primary	24	19.2
Illiterate	31	24.8

Source: compiled by the authors

The socio-demographic data of the study demonstrates the diverse background of the diabetic population, which could influence both disease management and mental health outcomes. Clinically, a significant portion of patients exhibited elevated systolic and diastolic blood pressure (35.20 and 30.40%, respectively) and abnormal glucose levels, including HbA1c, fasting plasma glucose, and postprandial glucose (Table 2).

Table 2. Clinical parameters of the enrolled patients

Clinical parameter	Frequency (n = 125)	Percentage (%)
Systolic blood pressure (SBP)		
Normal (<140 mm Hg)	81	64.8
Abnormal (≥140 mm Hg)	44	35.2
Diastolic blood pressure (DBP)		
Normal (<90 mm Hg)	87	69.6
Abnormal (≥90 mm Hg)	38	30.4
Haemoglobin glycosylated (HbA1c)		
Normal (<7%)	71	56.8
Abnormal (≥7%)	54	43.2
Fasting plasma glucose (FPG)		
Normal (<126 mg/dL)	79	63.2
Abnormal (≥126 mg/dL)	46	36.8
2-hour postprandial glucose (2-H PG)		
Normal (<180 mg/dL)	70	56.0
Abnormal (≥180 mg/dL)	55	44.0

Source: compiled by the authors

A significant portion of patients had elevated blood pressure, with 35.2% showing abnormal systolic levels (≥140 mm Hg) and 30.4% with abnormal diastolic levels (≥90 mm Hg). Moreover, a notable proportion of patients had poor glycemic control, as 43.2% had elevated HbA1c levels (≥7%), 36.8% had high fasting plasma glucose (≥126 mg/dL), and 44.0% had abnormal postprandial glucose levels (≥180 mg/dL). These findings suggest that many patients have both hypertension and glycemic control abnormalities, key factors in managing diabetes effectively. Notably, 29.6% of the patients were found to have depression, with varying degrees of severity (Fig. 1).

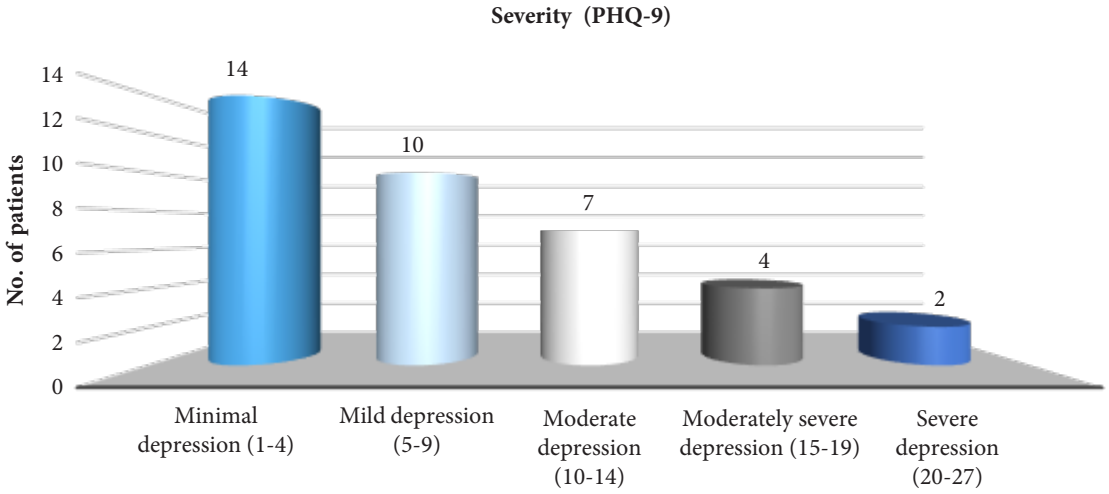

Figure 1. Graphical representation of the distribution of the severity of depression among enrolled patients
Source: compiled by the authors

The depression severity data show that most patients with depression experienced minimal (37.8%) or mild (27%) symptoms. Moderate depression affected 18.9% of patients, while more severe forms, including moderately severe (10.8%) and severe depression (5.4%), were less common. This indicates that most diabetic patients with depression in the study experienced milder forms, but a smaller proportion faced more severe mental health challenges.

The study highlights a substantial correlation between depression and poorer glycemic control, as evidenced by higher rates of abnormal glucose levels among depressed patients. Specifically, depressed individuals showed significantly higher levels of HbA1c, fasting plasma glucose, and postprandial glucose, indicating a potential link between depression and diabetes management difficulties (Table 3).

Table 3. Bivariate table: clinical parameter of diabetic patients with and without depression

Clinical parameter	With depression (n = 37)		Without depression (n = 88)		p-value
	Number	%	Number	%	
Systolic blood pressure (SBP)					
Normal (<140 mm Hg)	20	54.10	61	69.30	0.1503
Abnormal (≥140 mm Hg)	17	45.90	27	30.70	
Diastolic blood pressure (DBP)					
Normal (<90 mm Hg)	21	56.80	66	75.00	0.0556
Abnormal (≥90 mm Hg)	16	43.20	22	25.00	
Haemoglobin glycosylated (HbA1c)					
Normal (<7%)	11	29.70	60	68.20	0.0001
Abnormal (≥7%)	26	70.30	28	31.80	
Fasting plasma glucose (FPG)					
Normal (<126 mg/dL)	13	35.10	66	75.00	<0.0001
Abnormal (≥126 mg/dL)	24	64.90	22	25.00	
2-hour postprandial glucose (2-h PG)					
Normal (<180 mg/dL)	10	27.00	60	68.20	<0.0001
Abnormal (≥180 mg/dL)	27	73.00	28	31.80	
Duration of diabetes					
<5 years	8	21.62	28	31.82	0.2861
≥5 years	29	78.38	60	68.18	

Source: compiled by the authors

The above bivariate analysis shows significant associations between depression and several clinical parameters in diabetic patients. Those with depression had higher rates of abnormal glucose levels, including fasting plasma glucose (64.9 vs. 25.0%, $p < 0.0001$), postprandial glucose (73.0 vs. 31.8%, $p < 0.0001$), and HbA1c (70.3 vs. 31.8%, $p = 0.0001$) compared to non-depressed patients. Depression was also linked to abnormal diastolic blood pressure levels, although the latter showed borderline significance ($p = 0.0556$). These findings suggest that depression in diabetic patients is associated with poorer glycemic control.

Additionally, depression was associated with a higher prevalence of diabetes-related complications, such as nephropathy and neuropathy, further emphasising the complex interplay between mental and physical health in diabetic patients. Treatment patterns revealed a substantial reliance on oral drugs (49.6%), but a notable proportion of depressed patients used insulin with higher frequency. Lifestyle factors such as physical activity were also lower among depressed individuals, suggesting the need for targeted interventions to promote exercise and improve mental health (Table 4).

Table 4. Bivariate table: treatment and lifestyle factors of diabetic patients with and without depression

Treatment/Lifestyle factor	With depression (n = 37)		Without depression (n = 88)		p-value
	Number	%	Number	%	
Type of medication					
Insulin	18	48.6	24	27.3	$X^2 = 5.770$ 0.0559
Oral drugs	13	35.1	49	55.7	
Both	6	16.2	15	17.0	
Diabetes-related complication					
Yes	28	75.7	39	44.3	0.0016
No	9	24.3	49	55.7	
Workout					
Yes	8	21.6	35	39.8	0.0640
No	29	78.4	53	60.2	

Notes: X^2 – chi-square value
Source: compiled by the authors

The analysis of treatment and lifestyle factors reveals that diabetic patients with depression were more likely to use insulin (48.6 vs. 27.3%, $p = 0.0559$) and had a significantly higher prevalence of diabetes-related complications (75.7 vs. 44.3%, $p = 0.0016$) compared to those without depression. Additionally, depressed patients were less likely to engage in physical activity (21.6 vs. 39.8%, $p = 0.0640$), though this difference was not statistically significant. These findings suggest that depression in diabetic patients is correlated to more severe disease management challenges and higher complication rates. Higher HbA1c levels, fasting plasma glucose, and 2-hour postprandial glucose are significantly associated with higher PHQ-9 depression scores, while neuropathy, nephropathy, and retinopathy show no significant correlation with PHQ-9 scores (Table 5).

Table 5. Correlation of depression with severity of DM

Variable	Spearman's p	95% confidence interval	p-value
PHQ-9 score	1.000	N/A	-
HbA1c level	0.287	[0.104, 0.452]	0.006
Fasting plasma glucose	0.201	[0.027, 0.364]	0.047
2-hour postprandial glucose	0.318	[0.151, 0.476]	0.002
Neuropathy	0.125	[-0.043, 0.282]	0.214
Nephropathy	0.043	[-0.125, 0.206]	0.664
Retinopathy	0.182	[-0.013, 0.359]	0.082

Source: compiled by the authors

The correlation analysis shows that higher PHQ-9 depression scores are associated with worse glycemic control, as indicated by positive correlations with HbA1c levels ($r = 0.287$, $p = 0.006$), fasting plasma glucose ($r = 0.201$, $p = 0.047$), and 2-hour postprandial glucose ($r = 0.318$, $p = 0.002$). However, no significant correlation between depression and diabetes-related complications such as neuropathy, nephropathy, or retinopathy, was noted, suggesting that depression has a substantial correlation with poor glycemic control rather than complications. Higher PHQ-9 depression scores are significantly associated with lower values of a binary variable (Table 6).

Table 6. Correlation of depression with duration of DM

Variable	Point-biserial r	95% CI	p-value
PHQ-9 score	-0.231	[-0.389, -0.059]	0.018

Source: compiled by the authors

The analysis shows a significant negative correlation between PHQ-9 depression scores and the duration of diabetes ($r = -0.231$, $p = 0.018$), indicating that patients with longer durations of diabetes tend to have lower depression scores. This suggests that patients with long-term diabetes possibly possess coping mechanisms or have adapted to new conditions, leading to lower levels of depression. The findings of the study highlight the necessity of addressing both psychological and physiological components when managing diabetes to improve the outcomes for patients.

Discussion

DM affects 9.3% of the global population (463 million) as of 2019 and is projected to rise to 10.9% (700 million) by 2045. Urban areas (10.8%) and high-income countries (10.4%) demonstrate higher prevalence compared to rural areas (7.2%) and low-income countries (4.0%). Type 2 DM accounts for 90% of cases. In 2019, Sudan was among the countries with a DM prevalence exceeding 12%, according to the International Diabetes Federation [13]. The disparity in co-morbid depression prevalence among T2DM patients can be attributed to a difference in assessment methods, sociocultural and behavioural influences, and varied cutoff scores for depression diagnosis using identical techniques. A more detailed analysis of depression severity using PHQ-9 scores from 37 people demonstrates that most people with depression fit into the minimal (37.8%) or mild (27.0%) depression category. But a significant fraction also suffers from moderate (18.9%), fairly severe (10.8%), and severe (5.4%) depression, indicating the population's range of psychological distress levels. A study by M. Ismail *et al.* [14] reported that the incidence of depression with a PHQ-9 cutoff value of more than 4 was 20.1% with moderate depression accounting for most cases (70.8%), which is marginally lower than the results of the present study investigation.

Another study by M. Ebrahim *et al.* [15] revealed that 48.9% of depression was developed by diabetic outpatients. This outcome correlates with similar research findings from other regions, indicating a high prevalence of depression among diabetic patients. In Saudi Arabia, a study by A.A. El Mahalli [16] reported a depression prevalence of 49.6% among diabetic patients, emphasising the global nature of the mental health burden associated with diabetes. Similarly, research in Pakistan [17] determined a 43.5% prevalence of depression in diabetic populations, further underscoring the significant psychological challenges that accompany diabetes in diverse settings. Evidence suggests a bi-directional relationship between depression and type 2 diabetes (T2DM): patients are twice as likely to experience depression, while individuals with depression face a 60% higher risk of developing T2DM [18-20]. The prevalence of T2DM was extremely high in the context of the study by P. Ranasinghe *et al.* [8]. From 1972 to 2019, it increased from 3.3 to 19% in urban areas and from 2.4 to 15% in rural areas in India. The development of prevalent comorbidities and disability-adjusted life years (DALYs) in diabetic patients is significantly influenced by depression [21].

Research conducted in the population of India by S. Siddiqui *et al.* [22] aimed to ascertain the prevalence of depressive disorder among patients with T2DM and compare it with that of individuals without the disease. Findings indicated that the prevalence of depression in patients with known T2DM is nearly twice that of cases (35.38%) and controls (20%) without the disease. In a different study [23], it was discovered that of the 210 study participants, 103 (or 49%) had a PHQ-9 score of 10 or more, indicating that over half of them were depressed. The findings of this study are consistent with those of B. Kamble *et al.* [24], who reported an overall prevalence of depression at 48.1% among patients with diabetes and hypertension, using the same scale and cut-off score as in the present study. Similarly, N. Taneja *et al.* [25] determined a 42.6% prevalence of depression in individuals with both conditions. S. Khullar *et al.* [26] reported that 32% of patients experienced severe depression, while 25.3% had mild to moderate depression. These comparable results across studies reinforce the high burden of depression among patients managing chronic conditions such as diabetes and hypertension. These differences are attributable to variations in the study time, participants' sociodemographic profile, and study setting.

The age distribution of participants in the current study shows that although 94.6% of those with depression are older than 40, the difference with those without depression (93.2%) is not statistically significant. The study by O.B. Albasheer *et al.* [27] is comparable to most studies conducted in other nations worldwide, also revealing no significant correlation with length of diabetes, age, or gender. Additionally, a study by P. Aschner *et al.* [28] revealed that among T2DM patients, depression was associated with being female, being older, having lesser education, and having poorer glycemic control. Another study by V.G. Ashok & S.S. Ghosh [29] also demonstrated that depression in hypertension patients was predicted by the female gender, low socioeconomic level, and family support. A conflicting study revealed that depression in hypertensive individuals is markedly affected by variables such as gender, socioeconomic position, marital status, low educational attainment, regular physical activity, duration of hypertension, and uncontrolled blood pressure [30].

The results of a study conducted in Qatar [14] indicated that male gender was correlated with the development of depression. This finding is similar to the findings of a

study conducted in Ethiopia [15]. The gender distribution of those without depression shows a slightly higher representation of males (59.1%) than females (40.9%), although the difference is not statistically significant [31]. Nonetheless, additional research [32] revealed that female T2DM patients experienced a greater prevalence of depression. M.A.K. Khiro *et al.* [33] stated that correlating with previous research, female diabetic patients in this study were more likely to develop depression than male patients. Several aspects, including a lack of social support and a higher sensitivity to negative life experiences due to constitution, could account for this while in the present study males were slightly higher.

No substantial variations in marital status were noted between persons with depression and those without. Additionally, no notable associations were found between depressive state and employment status or educational attainment. However, the study revealed that individuals who were single, divorced, or widowed had higher rates of depression compared to those who were married. A study carried out in Sri Lanka [34] revealed a similar conclusion. Married individuals benefit from social and psychological support, which can alleviate depressive symptoms. Partner support also improves adherence to antidiabetic treatment, thereby reducing the risk of depression and other complications related to diabetes. Similarly, Y. Wang *et al.* [35] demonstrated that social support acts as a protective factor against depression.

In the present study, a comparison of clinical parameters between individuals with and without depression revealed certain significant correlations. Although individuals with depression showed a higher prevalence of abnormal diastolic blood pressure (DBP) compared to those without depression, the difference was non-significant. In both groups, systolic blood pressure (SBP) showed non-significant difference. Similarly, a recent Singapore study found that over 95% of DM patients had T2DM. Glycated haemoglobin and fasting blood glucose levels, as shown by H. Abuhegazy *et al.* [5], are associated with an increased chance of depression. In the present study, depression exhibited a significantly higher proportion of abnormal glucose levels across all metrics, including overall glucose, HbA1c, fasting plasma glucose, 2-hour postprandial glucose, and random plasma glucose levels. R. Das *et al.* [36] indicated that the development of depression in diabetic patients is significantly influenced by the HbA1c level, a measure of long-term glucose control there may be a connection between depression and inadequate glycemic control.

Several studies found that the mean HBA1c was considerably higher in the group of depressed patients compared to non-depressed patients in a sample of T2DM patients and that the intensity of depression symptoms was independently linked with HBA1c in a sample of T2DM patients [37]. There are several noteworthy correlations in a comparison of treatment/lifestyle characteristics between people with depression and people without depression. The type of medication had no significant effect on the difference between the two groups. According to a study by R. Maimaitituerxun *et al.* [38], 75.40% of participants received insulin treatment; in comparison to other individuals, this group had a 1.86-fold increased chance of getting depression. According to a study by P.S. Ciechanowski *et al.* [39], depression in adult diabetics is possibly correlated with a reduced adherence to diet, exercise, and medication. Studies by C.E. Lloyd *et al.* [40] have shown a correlation between low physical activity and increased depression in diabetic patients, as well as poor diet and physical activity compliance, but no correlation between medicine and depression was obtained in the present study.

According to the current study, patients with depression are significantly more likely than those without depression to report diabetes-related complications (75.7%). The present study data suggests that higher depression scores are associated with HbA1c levels, even though depression was found to be marginally correlated with poor glycemic control in patients at a high significant level in a study by S.J. Mahan & M.M. Mahammad [41]. The research demonstrates a substantial positive correlation among PHQ-9 scores, fasting plasma glucose, and 2-hour postprandial glucose, suggesting an association between increased glucose levels and heightened depression scores. A study by S. Sharif *et al.* [42] identified a significant disparity in fasting blood glucose levels between patients with and without depression. The study also revealed no substantial correlation between PHQ-9 scores and nephropathy or neuropathy; however, clinical depression was more prevalent among patients with diabetic retinopathy, nephropathy, and neuropathy. A substantial negative connection was found in the current study connection of Depression with Duration of DM between PHQ-9 depression scores and another unidentified variable. However, longer diabetes duration was related to higher depression in a study by P. Reddy *et al.* [43]. Diabetes duration was related to PHQ-9 scores. PHQ-9 was associated with more diabetes complications.

The current study determined that depression among diabetes patients at F.H. Medical College was slightly less prevalent than in other studies. However, depression remains a critical factor affecting the quality of life in chronic disease patients, with diabetes contributing to premature mortality, disability, and economic losses for individuals and healthcare systems.

Conclusions

This study highlighted a high prevalence of depression (29.6%) among patients with DM, emphasising the importance of routine depression screening in both outpatient and inpatient settings. Depression significantly impacts diabetes management, as evidenced by poorer glycemic control among depressed patients, including elevated HbA1c levels (70.3% of patients with depression had HbA1c ≥7% compared to 31.8% in non-depressed patients, $p = 0.0001$). Moreover, fasting plasma glucose levels were abnormal (≥126 mg/dL) in 64.9% of depressed patients compared to 25.0% of those without depression ($p < 0.0001$), while

postprandial glucose levels were abnormal (≥180 mg/dL) in 73.0% of depressed patients versus 31.8% in non-depressed patients ($p < 0.0001$).

Additionally, the study found that 75.7% of depressed patients had diabetes-related complications such as nephropathy and neuropathy, compared to 44.3% of non-depressed patients ($p = 0.0016$), underscoring the critical link between mental health and physical outcomes in diabetic patients. Depressed patients were also more likely to use insulin (48.6 vs 27.3% in non-depressed patients, $p = 0.0559$) and were less likely to engage in regular physical activity (21.6 vs 39.8%, $p = 0.0640$).

These findings strongly support the need for integrated care approaches that address both mental and physical health, requiring collaboration between endocrinologists, psychiatrists, and primary care providers. Future research should address the mechanisms linking diabetes and depression and develop effective interventions that manage both conditions simultaneously. The study also highlights potential methodological inconsistencies, such as the reliance on self-report questionnaires and the categorical treatment of depression and HbA1c, which may have influenced the findings. Additionally, the impact of antidepressant medications on glycemic control warrants further exploration. Overall, incorporating mental health into diabetes care is crucial for improving patient outcomes.

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Conflict of Interest

None.

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Поширеність депресії серед хворих на цукровий діабет, які перебувають на амбулаторному та стаціонарному лікуванні

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Анотація. Цукровий діабет – це сукупність метаболічних захворювань, які характеризуються стійкою гіперглікемією, що призводить до наслідків, які впливають на кілька систем органів. Депресія є поширеним і впливовим психосоціальним станом у пацієнтів з діабетом, який ще більше ускладнює контроль глікемії та негативно впливає на загальний стан здоров'я. Дане дослідження вивчало поширеність депресії серед пацієнтів з цукровим діабетом, які перебувають на амбулаторному лікуванні, та її вплив на перебіг діабету. Це лікарняне перехресне спостереження проводилося протягом 18 місяців. Вибірка з 125 пацієнтів з цукровим діабетом була відібрана на основі 9 % показника поширеності з 5 % похибкою та 95 % довірчим інтервалом. Депресію було оцінено за допомогою 9-пунктного опитувальника для скринінгу депресії. Клінічне оцінювання включало вимірювання рівня HbA1c, глюкози в плазмі крові натще та постпрандіальної глюкози. Статистичний аналіз проводився за допомогою програмного забезпечення SPSS. Дослідження показало, що у 29,6 % пацієнтів з діабетом діагностували депресію різного ступеня тяжкості. Депресія асоціювалася з гіршим глікемічним контролем, про що свідчили достовірно вищі рівні HbA1c, глюкози плазми крові натще та постпрандіальної глюкози. Пацієнти з депресією також мали вищу поширеність пов'язаних з діабетом ускладнень, таких як нефропатія та нейропатія. У дослідженні зроблено висновок, що депресія поширена серед пацієнтів з цукровим діабетом і має значний вплив на управління діабетом. Практична цінність цього дослідження полягає в тому, що інтегрована допомога, включаючи скринінг та лікування психічних розладів, має вирішальне значення для покращення результатів лікування пацієнтів з діабетом

Ключові слова: *diabetes mellitus*; контроль глікемії; гіперглікемія; ускладнення діабету