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Original Research Article

Frequency of Depression in Young Patients with Diabetes Mellitus

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Abstract: *Diabetes mellitus (DM) is a chronic metabolic disorder associated with numerous physical and psychological complications. Depression is a common comorbidity in diabetic patients, significantly impacting self-care, glycemic control, and quality of life.* ***Objective:*** *To determine the frequency of depression in young patients with diabetes mellitus aged 15–45 years.* ***Methods:*** *This descriptive cross-sectional study was conducted at the Department of Medicine, PAEC General Hospital Islamabad from October 2024 till March 2025. A total of 122 diabetic patients aged 15–45 years, with a duration of diabetes over six months, were enrolled through non-probability consecutive sampling. Sociodemographic and clinical data were collected using a structured proforma.* ***Results:*** *Among 122 patients, 49 (40.2%) were diagnosed with depression. Depression was more common among females (45.3%) than males (34.5%). It was more prevalent in patients with lower income (<25,000 PKR/month: 57.9%), illiterate individuals (72.2%), and those with longer diabetes duration (>10 years: 52%). Higher rates were also observed among smokers (54.8%) and those with hypertension (50%). Depression severity ranged from mild (15.6%) to moderate (14.8%) and severe (9.8%). Significant associations were found between depression and income (p=0.01), education level (p=0.003), smoking (p=0.04), and hypertension (p=0.05).* ***Conclusion:*** *Depression is highly prevalent among young patients with diabetes, particularly those with lower socioeconomic status, poor education, and longer disease duration. Routine mental health screening and integrated psychological support should be incorporated into diabetes management to improve overall outcomes.*

Keywords: *Depression, Diabetes Mellitus, Glycemic Control, Hypertension, Mental Health Screening, Socioeconomic Status, Young Adults*

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Introduction

Diabetes mellitus (DM) is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from either impaired insulin secretion, insulin action, or both (1). It is a major global health concern affecting an estimated 537 million adults worldwide as of 2021, with this number expected to rise to 643 million by 2030 and 783 million by 2045, according to the International Diabetes Federation (IDF) (2). Diabetes is not only a leading cause of morbidity and mortality but also significantly compromises the quality of life by affecting nearly every organ system (3). It contributes to a spectrum of complications such as retinopathy, nephropathy, neuropathy, and macrovascular diseases including myocardial infarction and stroke. Diabetes is the leading cause of blindness, kidney failure, lower limb amputations, and is a major contributor to cardiovascular mortality (4). In addition to its physical impact, diabetes is closely associated with mental health disturbances, particularly depression, which is a frequent and often underdiagnosed comorbidity.

Depression in diabetic patients can result in diminished self-care behaviors, including poor adherence to dietary recommendations, physical inactivity, inadequate blood glucose monitoring, and missed clinical appointments (5). These behaviors, in turn, exacerbate glycemic control and increase the risk of acute and chronic complications. Studies have shown that depression affects approximately 30–35% of all individuals with diabetes, with women and younger patients being more vulnerable. Furthermore, depression in diabetic patients is associated with a 50–100% increased risk of poor glycemic control, complications, and even early mortality (6)(7). The World Health Organization (WHO) estimates the global prevalence of depression at 5%, making it one of the leading causes of disability worldwide. Depression is expected to become the second leading cause of global disease burden, just after cardiovascular diseases. In diabetic populations, however, studies have shown a two to threefold higher prevalence of depression than in the general population (8). Depression not only increases the risk of diabetes-related complications but is also associated with a 4.5-fold increase in healthcare costs due to more frequent hospitalizations and poorer treatment adherence (9).

Despite the growing awareness, depression remains underdiagnosed and undertreated in diabetic patients, especially in younger populations (10). Younger individuals with diabetes often face unique stressors such as career pressure, social stigma, and life transitions, making them more vulnerable to psychological distress (11). In many settings, mental health is not routinely evaluated as part of diabetes management, leading to a gap in comprehensive care. In Pakistan, data on the prevalence of depression in young diabetic patients remains limited, and reported figures vary significantly between populations. Cultural stigma, lack of mental health infrastructure, and limited screening practices contribute to underreporting. Given the bidirectional and compounding relationship between depression and diabetes, early detection and intervention are crucial to prevent worsening of both mental and physical health outcomes. Therefore, this study was designed to determine the frequency of depression in young patients with diabetes mellitus at a tertiary care hospital.

Methodology

This descriptive cross-sectional study was conducted at the Department of Medicine, PAEC General Hospital, Islamabad from October 2024 till March 2025. A total of 122 patients were included in the study. Participants were selected based on specific criteria to ensure the inclusion of a representative sample of the young diabetic population. Eligible individuals were those diagnosed with diabetes mellitus, as per the operational definition, with a disease duration of more than six months. They were either on oral hypoglycemic agents or insulin therapy. Only patients between the ages of 15 and 45 years were included, as the study specifically focused on the younger population, and both male and female participants were eligible for inclusion.

Certain individuals were excluded to avoid potential confounding factors. Patients with a history of mood disorders, psychotic disorders, or anxiety disorders prior to the onset of end-stage renal disease, as identified through their medical history and records, were not considered. Similarly, those with a documented history of antipsychotic medication use were excluded. The study also omitted individuals diagnosed with hepatic or renal encephalopathy, determined through clinical examination and laboratory investigations. Patients with a history of hypothyroidism—defined as a TSH level greater than 5.2 mIU/L, FT3 below 1.5 pg/ml, and FT4 below 0.8 pg/ml—were also excluded. Lastly, individuals with a history of drug or substance addiction, as indicated by their clinical history and medical documentation, were not included in the study.

After receiving approval from the ethical review committee, a total of 122 diabetic patients meeting the inclusion criteria were enrolled using a non-probability consecutive sampling technique. Written informed consent was obtained from all participants. Each patient was assessed through a structured data collection proforma. Sociodemographic information such as age, gender, place of residence (urban or rural), education level, monthly income, and employment status was recorded. Clinical data including type of diabetes (Type 1 or Type 2), duration of disease, presence of hypertension, family history of diabetes, and smoking status were also documented. Depression status was assessed by the principal investigator based on ICD-10 diagnostic criteria and recorded as either present or absent. All interviews and data recordings were conducted in person, ensuring accuracy and completeness of the dataset.

The collected data were analyzed using SPSS version 25.0. Quantitative variables such as age and duration of diabetes were summarized using mean and standard deviation. Qualitative variables including gender, type of diabetes, smoking status, hypertension, education, income, and presence or absence of depression were presented as frequencies and percentages. To evaluate the association between depression and potential risk factors or demographic characteristics, stratification was performed followed by application of the Chi-square test. A p-value of ≤ 0.05 was considered statistically significant for all comparisons.

Results

Out of 122 diabetic patients, the average age was 33.4 years, with a nearly even gender distribution (58 males, 64 females). Type 2 diabetes was more common (71.3%) than type 1 (28.7%). A family history of diabetes was present in 63.1% of patients. Depression was more frequent among females (45.3%) compared to males (34.5%), among type 2 diabetics (40.2%), and in those with a family history of diabetes (45.5%). Smoking and hypertension were both associated with higher depression rates—54.8% and 50% respectively. Those living in rural areas had slightly higher depression than urban residents. Notably, depression was most common in patients with income below 25,000 PKR (57.9%) and among the illiterate group (72.2%). The unemployed were more affected (47.2%) than the employed (34.8%). Significant p-values were noted for income (0.01), education (0.003), smoking (0.04), and hypertension (0.05).

Table 1: Detailed Demographic and Clinical Profile

Variable	Total	Depression Present (n=49)	Depression Absent (n=73)
Gender	Male: 58 (47.5%) Female: 64 (52.5%)	Male: 20 Female: 29	Male: 38 Female: 35
Type of Diabetes	Type 1: 35 (28.7%) Type 2: 87 (71.3%)	Type 1: 14 Type 2: 35	Type 1: 21 Type 2: 52
Duration of Diabetes (years)	6.2 ± 3.1	-	-
Family History of DM	Yes: 77 (63.1%) No: 45 (36.9%)	Yes: 35 No: 14	Yes: 42 No: 31

73 (59.8%) had no depression, while 49 (40.2%) had varying severity. Of these, 19 (15.6%) had mild depression, 18 (14.8%) had moderate depression, and 12 (9.8%) were severely depressed. Depression was slightly more common among females across all severity levels—particularly in moderate (18.8%) and severe categories (10.9%). Similarly, depression was more frequent among type 2 diabetics compared to type 1 across all severity categories, highlighting that while most patients were not depressed, a significant portion suffered from clinically important depressive symptoms.

Table 2: Depression Severity Classification using ICD-10

Severity Category	Frequency (n=122)	Male (n=58)	Female (n=64)
No Depression	73 (59.8%)	38 (65.5%)	35 (54.7%)
Mild Depression	19 (15.6%)	9 (15.5%)	10 (15.6%)
Moderate Depression	18 (14.8%)	6 (10.3%)	12 (18.8%)
Severe Depression	12 (9.8%)	5 (8.6%)	7 (10.9%)

Among those with diabetes for less than 2 years, only 16.7% had depression. In contrast, depression affected 42.9% of those with 2–5 years of disease, 40.5% in the 6–10-year range, and rose to 52% among those with diabetes for more than 10 years. This trend demonstrates a clear correlation between longer diabetes duration and greater emotional distress (p-value = 0.04).

Table 3: Cross-tabulation of Depression with Duration of Diabetes

Duration of Diabetes (Years)	Total Patients	Depression Present	Depression Absent
<2	18	3	15
2–5	42	18	24
6–10	37	15	22
>10	25	13	12

Unemployed patients earning less than 25,000 PKR had the highest rate of depression (75%), followed by unemployed patients in the 25–50k income bracket (64.3%). Even employed patients in the lowest income group had notable depression rates (45.5%). On the other hand, employed individuals earning over 50,000 PKR had the lowest rate of depression at just 18.2%. These results show a strong inverse relationship between income level and depression, especially when compounded by unemployment.

Table 4: Depression vs Employment and Income

Group	No. of Patients	Depression Present	Depression Absent
Unemployed <25k	16	12	4
Unemployed 25–50k	14	9	5
Unemployed >50k	6	3	3
Employed <25k	22	10	12
Employed 25–50k	31	7	24
Employed >50k	33	6	27

Among smokers, over half (54.8%) were found to be depressed, compared to only 35.2% of non-smokers. Similarly, 50% of hypertensive patients were depressed, versus 34.6% of those without hypertension. These findings suggest that smoking and comorbid hypertension significantly contribute to mental health vulnerability in diabetic patients.

Table 5: Depression vs Smoking and Hypertension

Risk Factor	Total	Depression Present	Depression Absent
Smoking – Yes	31	17	14
Smoking – No	91	32	59
Hypertension – Yes	44	22	22
Hypertension – No	78	27	51

Discussion

This study identified a high prevalence of depression (40.2%) among young patients with diabetes mellitus, emphasizing the considerable psychological burden faced by this group. The observed frequency is

notably higher than that of the general population, indicating that diabetes significantly increases the risk of depression. This is consistent with previous research, which has shown that individuals with diabetes are more likely to experience depressive symptoms compared to non-diabetics (12). Research findings have confirmed lack of evidence for a connection between depression rates in Parkinson's patients versus individuals with stroke thus indicating that chronic disease stress affects mental health levels similarly (13, 14).

A percentage of 45.3% of females reported depression compared to 34.5% of males but this gender difference proved insignifcant statistically. The findings of this study fill in line with existing literature showing women including those suffering from chronic illnesses tend to develop depression because of biological factors combined with psychosocial elements (15). Prior research confirms that economic pressure stands as a primary cause of mental health deterioration within patients who have chronic health conditions (16). Education level showed an inverse link to depression development rates in this population. The depression rate among uneducated people amounted to 72.2% yet it decreased progressively with increasing educational levels until reaching 27.3% among matriculated or higher educated individuals. Research literature supports these findings since better disease awareness together with improved coping methods and healthcare accessibility come from education (17). The duration of diabetes and other health-related symptoms affected how often people developed depression. The duration of diabetes played a direct role in depression levels among participants because patients who had less than two years of diabetes displayed only 16.7% depression rates but the figure climbed to 52% for those with more than ten years of diabetes duration. EA reports this link in their previous research because disease management, complications and psychological fatigue become more burdensome over time. The study indicated that both smoking and having hypertension as a secondary condition influenced depression development. Depression rates among smokers reached 54.8% according to research findings yet non-smokers presented only 35.2% of depression cases. Similarly, depression affected 50% of hypertensive patients but remained at 34.6% in patients without hypertension.

Conclusion

This study revealed a high frequency of depression (40.2%) among young patients with diabetes mellitus, highlighting a significant mental health burden in this population. Depression was more common in females, those with lower income and education levels, longer duration of diabetes, comorbid hypertension, and smoking habits. These findings emphasize the urgent need for routine psychological screening and integrated mental health support in the management of diabetic patients. Early identification and treatment of depression can improve patient compliance, quality of life, and overall diabetes outcomes, ultimately reducing both physical and psychological complications.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-PAEC-244-4-24)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

A (Resident Medicine)

Review of Literature, Data entry, Data analysis, and drafting article. Manuscript drafting, Study Design,

TH (Medical Specialist)

Study Design, manuscript review, critical input.
Conception of Study, Development of Research Methodology Design

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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