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COMPARATIVE ANALYSIS OF MENTAL DISORDERS AMONG PATIENTS WITH DIABETES MELLITUS AGED 18–65 YEARS

Mehdi Zada L.A.[1]

Abstract

The aim of this study was to determine the prevalence of depression, its clinical characteristics, and its association with quality of life, functional status, and diabetes-related emotional distress among adult patients with diabetes mellitus. To examine the prevalence, clinical features, and functional consequences of depression among diabetic patients aged 18–65, with emphasis on psychosocial correlates and disability outcomes. A cross-sectional clinical-psychiatric study was conducted among diabetic patients aged 18–65. Standardized instruments, including PHQ-9 , the Diabetes Distress Scale (DDS), Diabetes Quality of Life Scale (DQOL), and the WHO Disability Assessment Schedule (WHODAS 2.0) were applied alongside psychiatric evaluation using ICD-10/DSM-5 criteria for depressive disorders. A cross-sectional clinical study involving 186 adult diabetic patients (Type 1 = 48; Type 2 = 138) attending an endocrinology clinic. Standardized psychometric scales (PHQ-9,DDS,DQOL,WHODAS 2.0) and laboratory measures (HbA1c) were administered. Pearson correlations and multiple linear regressions were used to examine relationships between psychiatric and metabolic variables. 42.4% of people had moderate-to-high diabetes distress (DDS ≥ 2.0), and 29.6% of people had clinically significant depression (PHQ-9 ≥ 10). Poor glycemic control and a lower quality of life are significantly predicted by depression and diabetes-related distress. Depressive symptoms were detected in approximately one-quarter to one-third of the diabetic population, with higher prevalence in females, individuals with longer disease duration, and those reporting poor metabolic control. Patients with comorbid depression demonstrated significantly higher DDS scores (greater diabetes-related emotional burden), lower DQOL scores, and elevated WHODAS disability scores compared to non-expressed diabetic controls.

Key words: *diabetes mellitus, mental disorders, depression, anxiety, diabetes distress, quality of life, functional impairment, WHODAS, DDS, DQOL, PHQ-9, adults aged 18–65.*

Introduction

Diabetes mellitus (DM) is a long-term metabolic disease that has serious effects on health around the world. In addition to physical complications, psychiatric comorbidities - especially major depressive disorder (MDD) - are commonly observed [7]. Epidemiological studies indicate that individuals with diabetes are almost twice as likely to suffer from depression compared to the general population [10]. The relationship is bidirectional: depression

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raises the risk of diabetes through behavioral and biological mechanisms, whereas diabetes-related stressors and complications render individuals susceptible to depressive episodes [15]. The simultaneous presence leads to inadequate glycemic regulation, elevated complication rates, decreased treatment adherence, and a lowered quality of life. The current study examines depression in diabetic individuals aged 18 to 65 years, a demographic particularly susceptible to psychosocial and occupational disability. According to a meta-analysis of 42 studies (n = 21,351), type 2 diabetes had a prevalence of depressive symptoms of 27%, while type 1 diabetes had a prevalence of 23% [9]. According to data from the 2019 NHANES survey, the lifetime prevalence of major depressive disorder was 24% for adults with diabetes and 11% for those without the disease ($p < 0.001$). The reported prevalence in low- and middle-income nations ranges from 15% to 35%, in part because of cultural and underdiagnosing factors. On the other hand, after controlling for socioeconomic status and BMI, longitudinal studies show that individuals with major depressive disorder have a 37% higher chance of acquiring type 2 diabetes within ten years [3]. This reciprocal relationship points to common behavioral and biological processes.

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Materials and Methods

This study employs a cross-sectional, descriptive, and analytic design. The study includes adult patients aged 18 to 65 years (n= 186) with a diagnosis of type 1 or type 2 diabetes mellitus. Location: The Republic Endocrinology Center, Baku.). Exclusion criterias are severe cognitive impairment, psychotic disorders, substance dependence, pregnancy. Psychiatric Assessment: Structured clinical interview according to ICD-10 criteria for depressive disorders. *Diabetes Distress Scale (DDS):* Measures diabetes-related emotional burden. The Diabetes Distress Scale (DDS) is a validated self-report instrument specifically developed to measure the emotional and psychological burden associated with living with diabetes. Unlike generic depression measures, the DDS captures diabetes-specific stressors, including frustration with treatment regimens, fear of complications, interpersonal challenges, and perceived lack of support from healthcare providers [9]. The DDS consists of 17 items divided into four domains:

1. Emotional burden **–** feelings of being overwhelmed by the demands of diabetes.
2. Physician-related distress – dissatisfaction or lack of trust in medical support.
3. Regimen-related distress – stress linked to complex treatment adherence, diet, and lifestyle modifications.
4. Interpersonal distress – lack of support or understanding from family, friends, or peers. Each item is scored on a 6-point Likert scale (1 = no problem, 6 = a very serious problem), with higher scores indicating greater distress. A mean score ≥3 is typically considered clinically significant. In diabetic populations, DDS has demonstrated strong reliability

(Cronbach's α > 0.85) and predictive validity for both poor glycemic control (HbA1c) and psychiatric comorbidities such as depression and anxiety.

Diabetes Quality of Life (DQOL): Evaluates subjective quality of life related to diabetes. The scale comprises 46 items covering four domains.

1. Satisfaction with treatment – perceived adequacy of medical care, convenience, and effectiveness.
2. Impact of diabetes – effect of the disease on social life, work, and leisure.
3. Worry about future effects – concerns regarding long-term complications and disease progression.
4. Social/vocational concerns – limitations in career, social interactions, and independence

The Diabetes Quality of Life (DQOL) Scale [13] is one of the most widely used disease-specific instruments to assess health-related quality of life in diabetic patients. Originally developed during the Diabetes Control and Complications Trial (DCCT), the DQOL has been extensively validated in both type 1 and type 2 diabetes populations. In psychiatric research, DQOL has shown strong sensitivity to the presence of depression and diabetes distress, as patients with depressive symptoms report markedly reduced satisfaction and higher disease burden [13]. By including DQOL in this article, the study captures subjective well-being alongside psychiatric diagnoses, thus reflecting the patient's own perspective of living with diabetes and depression [13]. Responses are typically recorded on a 5-point Likert scale, and domain scores can be computed to generate an overall quality of life index. Lower scores indicate poorer perceived quality of life.

WHO Disability Assessment Schedule (WHODAS 2.0): Measures functional disability across six domains [8]. The WHO Disability Assessment Schedule (WHODAS 2.0) is a generic instrument developed by the World Health Organization to measure disability and functional impairment across a wide range of health conditions, including chronic diseases and psychiatric disorders. It reflects the International Classification of Functioning, Disability, and Health (ICF) framework, thereby allowing for cross-cultural comparability. This scale assesses functioning in six domains:

1. Cognition (understanding and communication)
2. Mobility (movement and walking)
3. Self-care (hygiene, dressing, eating)
4. Getting along (interpersonal interactions)
5. Life activities (work and household responsibilities)
6. Participation (community involvement and social activities)

The scale is available in 12-item and 36-item versions; in psychiatric research, the 36-item version is commonly used to capture nuanced functional deficits. Scores are calculated on a 0–100 scale, with higher values indicating greater disability. For diabetic patients, WHODAS 2.0 provides an objective measure of disability burden, bridging the gap between psychiatric symptoms (e.g., depression) and their real-world impact on functioning. Its application in this study supports a holistic evaluation of how depression and distress affect daily living, beyond symptom severity. Participants gave informed consent. Psychiatric interviews were conducted

by qualified psychiatrists. Questionnaires (DDS, DQOL, WHODAS) were administered in a standardized sequence. Data were analyzed using descriptive statistics, chi-square for categorical comparisons, and t-tests/ANOVA for group differences. The integration of PHQ-9, DDS, WHODAS, and DQOL establishes a comprehensive framework for evaluating psychiatric morbidity in diabetic patients aged 18 to 65. DDS [9] identifies distress specific to diabetes that overlaps with but is distinct from clinical depression. WHODAS measures the functional impairment resulting from psychiatric and physical comorbidity. The DQOL assesses subjective quality of life by incorporating medical and psychosocial dimensions. These instruments facilitate a thorough assessment of the manifestation of depression in diabetic patients, encompassing both its psychiatric diagnosis and its wider implications for functional status and quality of life.

Results

A total of 186 participants (52.7% female, mean age = 49.8 ± 12.3 years) were recruited through consecutive sampling. 42.4% of people had moderate-to-high diabetes distress (DDS ≥ 2.0), and 29.6% of people had clinically significant depression (PHQ-9 ≥ 10). The mean HbA1c was 8.4 ± 1.6%. The degree of depression had a negative correlation with DQOL ($r = -0.58$, $p < 0.001$) [1,13,9] and a positive correlation with HbA1c ($r = 0.42$, $p < 0.001$), DDS ($r = 0.61$, $p < 0.001$), and WHODAS total score ($r = 0.53$, $p < 0.001$). PHQ-9 and DDS together accounted for 38% of the variance in HbA1c levels, according to regression analysis. The study population's sociodemographics show a slight female predominance (52.7%) and a mean age of 49.8 years. The participants' moderately chronic disease course was indicated by the mean duration of diabetes, which was 9.1 years. In line with the global distribution pattern of diabetes prevalence, type 2 diabetes mellitus affected about three-quarters (74.2%) of the sample. The mean HbA1c level of 8.4 ± 1.6%, which was higher than the advised target of less than 7%, showed that participants' glucose control was generally poor. Psychometrically, the DDS mean score (2.21 ± 0.78) indicates that a significant percentage of participants have clinically significant emotional distress related to diabetes, while the average PHQ-9 score (9.7 ± 5.8) is in the mild-to-moderate depressive range. The average quality of life (DQOL) score was 58.6 ± 14.2, which indicates a moderate level of satisfaction and a discernible psychosocial burden. Additionally, a mean WHODAS 2.0 score of 32.5 ± 17.1% suggests a moderate impairment in day-to-day functioning. The PHQ-9 criteria for clinically significant depression (≥10) were met by 29.6% of participants. This is consistent with research from around the world that shows depression rates among diabetic populations range from 25% to 35%. Furthermore, 42.4% showed moderate to high levels of diabetes distress (DDS ≥ 2.0), indicating that this cohort has a significant emotional burden related to managing diabetes. Lastly, moderate-to-severe functional disability (WHODAS > 25) was present in 33.8% of patients, highlighting the real-world effects of physical and psychological limitations on daily activities. The need for integrated psychosocial and medical management in diabetic care is highlighted by the elevated levels of both depression and distress, which are probably causing suboptimal glycemic control.

Table 1. Sociodemographic and Clinical Profile of Participants (N = 186)

Variable	Mean ± SD / n (%)
Age (years)	49.8 ± 12.3
Gender (female)	98 (52.7%)
Diabetes duration (years)	9.1 ± 5.7
Type 2 Diabetes Mellitus Type 1 Diabetes Mellitus	138 (74.2%) 48 (25.8%)
HbA1c (%)	8.4 ± 1.6
PHQ-9 total score	9.7 ± 5.8
DDS mean score	2.21 ± 0.78
DQOL total score	58.6 ± 14.2
WHODAS 2.0 (%)	32.5 ± 17.1

Table 2. Prevalence of Psychological and Functional Outcomes

Measure	Clinical Threshold	Prevalence (%)
Clinically significant depression (PHQ-9 ≥ 10)	Moderate or higher depression	**29.6%**
Moderate/high diabetes distress (DDS ≥ 2.0)	Elevated emotional burden	**42.4%**
Moderate-to-severe functional disability (WHODAS > 25)	Notable activity limitation	**33.8%**

Table 3. Pearson Correlation Matrix between Glycemic, Psychological, and Functional Variables (N = 186).

Variables	HbA1c	PHQ-9	DDS	DQOL	WHODAS
HbA1c	—	0.42***	0.39***	–0.36***	0.33**
PHQ-9	0.42***	—	0.61***	–0.58***	0.53***
DDS	0.39***	0.61***	—	–0.55***	0.47***
DQOL	–0.36***	–0.58***	–0.55***	—	–0.49***
WHODAS	0.33**	0.53***	0.47***	0.49***	—

Glycemic control (HbA1c), depression severity (PHQ-9), diabetes distress (DDS), diabetes-related quality of life (DQOL), and functional disability (WHODAS 2.0) are the two main clinical and psychometric variables that are shown in the Pearson correlation matrix (Table 3). In the study cohort, there were significant correlations between metabolic and psychological parameters, with all correlations being statistically significant ($p < 0.01$).

Discussion

Positive Associations: a moderate positive correlation was observed between HbA1c and PHQ-9 ($r = 0.42$, $p < 0.001$), suggesting that patients with more severe depressive symptoms tend to have poorer glycemic

control. Similarly, HbA1c correlated positively with DDS ($r = 0.39$, $p < 0.001$) and WHODAS ($r = 0.33$, $p < 0.01$), implying that both emotional distress and functional disability are associated with elevated blood glucose levels. These results lend credence to the idea that psychological stress may impede dietary adherence, medication compliance, and diabetes self-management. The strongest correlation in the matrix was between PHQ-9 and DDS ($r = 0.61$, $p < 0.001$), reflecting a robust overlap between general depressive affect and diabetes-specific emotional distress. This strengthens the conceptual understanding that, despite being separate concepts, diabetes distress and depression frequently coexist and exacerbate one another. A self-perpetuating cycle of emotional exhaustion and inadequate disease control can result from patients with depressive symptoms feeling more burdened by the demands of diabetes-related self-care. Additionally, there was a moderately positive correlation between depression (PHQ-9) and functional disability (WHODAS; $r = 0.53$, $p < 0.001$), suggesting that higher levels of depressive symptomatology are linked to more impairment in participation, social functioning, and everyday life activities. Likewise, there was a positive correlation between DDS and WHODAS ($r = 0.47$, $p < 0.001$), indicating that diabetes distress is linked to both practical functioning limitations and emotional distress. *Negative Associations:* In contrast, DQOL scores were negatively correlated with all other psychological and metabolic variables. Specifically, significant inverse correlations were found with PHQ-9 ($r = –0.58$, $p < 0.001$), DDS ($r = –0.55$, $p < 0.001$), and WHODAS ($r = –0.49$, $p < 0.001$). This pattern indicates that increased depression, emotional distress, and disability are all associated with reduced perceived quality of life. The negative relationship between HbA1c and DQOL ($r = –0.36$, $p < 0.001$) further suggests that poorer glycemic control diminishes subjective well-being and satisfaction with life.

Conclusion

Poor glycemic control and a lower quality of life are significantly predicted by depression and diabetes-related distress [5,1,7]. For thorough patient management, psychiatric screening instruments like the DDS and PHQ-9 must be incorporated into diabetes treatment. Sociodemographic distribution: Elevated prevalence observed in females, unemployed individuals, and those with lower levels of educational achievement [15,9]. Depression exhibited a significant association with prolonged diabetes duration, elevated HbA1c levels, and the presence of microvascular complications, including neuropathy and retinopathy. Patients with depression exhibited elevated DDS scores, signifying an increased emotional burden. The DQOL scores indicated a significant reduction, signifying a decline in well-being and satisfaction. WHODAS disability scores were increased in the areas of cognition, mobility, participation, and interpersonal relationships [6,13,8]. The results indicate that depression is a prevalent and clinically relevant psychiatric disorder among diabetic individuals aged 18 to 65. In alignment with global literature, women and patients exhibiting poor glycemic control faced an increased risk. Multiple factors account for this elevated comorbidity.

Biological mechanisms include inflammation, dysregulation of the HPA axis, and alterations in neurotransmitter levels;

• The psychological burden associated with managing chronic illness;

• Behavioral effects encompass inadequate

adherence to treatment and lifestyle modifications. Depression exacerbates clinical outcomes and results in functional disability, evidenced by elevated WHODAS scores, and diminishes life satisfaction, as indicated by lower DQOL scores [6,13,8]. The findings underscore the necessity for integrated psychosomatic care models, involving collaboration among psychiatrists, endocrinologists, and psychologists in the management of diabetic patients [14,11,13,7].

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18–65 YAŞLI ŞƏKƏRLI DIABET PASIYENTLƏRINDƏ PSIXI POZUNTULARIN MÜQAYISƏLI TƏDQIQI

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Xülasə

Tədqiqatın əsas məqsədi şəkərli diabetlə (ŞD) yaşayan yetkin pasiyentlərdə depressiyanın yayılma tezliyini, klinik xüsusiyyətlərini və onun həyat keyfiyyəti, funksional fəaliyyət və emosional distress göstəriciləri ilə qarşılıqlı əlaqəsini müəyyənləşdirməkdən ibarət olmuşdur. Tədqiqat 18–65 yaş arası 186 diabetli xəstə arasında aparılmışdır. Klinik-psixiyatrik qiymətləndirmə ICD-10 və DSM-5 kriteriyalarına əsaslanaraq aparılmış, eyni zamanda aşağıdakı standartlaşdırılmış psixometrik alətlərdən istifadə edilmişdir: PHQ-9 (depressiya dərəcəsi), Diabetes Distress Scale – DDS (diabetlə bağlı emosional gərginlik), Diabetes Quality of Life – DQOL (diabetlə əlaqəli həyat keyfiyyəti) və WHO Disability Assessment Schedule – WHODAS 2.0 (funksional əlillik dərəcəsi). Məlumatların statistik analizi korrelyasiya və çoxsaylı reqressiya modelləri ilə aparılmışdır. İştirakçıların 29,6 %-də klinik əhəmiyyətli depressiya (PHQ-9 ≥ 10), 42,4 %-də isə orta və yüksək səviyyəli diabet distresi (DDS ≥ 2,0) aşkar edilmişdir. Depressiya dərəcəsi DQOL ilə mənfi ($r = –0,58$; $p < 0,001$), DDS ($r = 0,61$; $p < 0,001$), WHODAS ($r = 0,53$; $p < 0,001$) və HbA1c ($r = 0,42$; $p < 0,001$) ilə müsbət korrelyasiya göstərmişdir. Depressiya və diabet distresi artdıqca həyat keyfiyyəti əhəmiyyətli dərəcədə aşağı düşmüş, funksional məhdudiyyətlər isə artmışdır. Tədqiqat göstərmişdir ki, şəkərli diabet xəstələrində depressiya və diabetlə bağlı emosional distress xəstəliyin gedişatına, qanda şəkərin tənzimlənməsinə və psixososial rifaha mənfi təsir göstərir. Bu səbəbdən PHQ-9 və DDS kimi psixometrik alətlərin mütəmadi skrininq məqsədilə diabetik pasiyentlərin klinik idarəçiliyinə daxil edilməsi vacibdir. Diabetin yalnız bioloji deyil, həm də psixososial aspektlərindən ibarət kompleks yanaşma xəstələrin ümumi sağlamlıq və həyat keyfiyyətinin yüksəldilməsində mühüm rol oynaya bilər.

Açar sözlər: şəkərli diabet, psixi pozuntular, depressiya, təşviş, diabet distresi, həyat keyfiyyəti, funksional pozulma, WHODAS, DDS, DQOL, PHQ-9, 18–65 yaş.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ ПСИХИЧЕСКИХ РАССТРОЙСТВ У ПАЦИЕНТОВ С САХАРНЫМ ДИАБЕТОМ В ВОЗРАСТЕ 18–65 ЛЕТ

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Резюме

Целью исследования было определить распространенность депрессии, ее клинические особенности, а также взаимосвязь с показателями качества жизни, функционального состояния и диабетического дистресса у взрослых пациентов с сахарным диабетом.

В исследование были включены 186 пациентов с сахарным диабетом в возрасте 18–65 лет. Клинико-психиатрическая оценка проводилась на основе диагностических критериев МКБ-10 и DSM-5. В исследовании использовались стандартизированные психометрические инструменты: PHQ-9 (оценка выраженности депрессии), Diabetes Distress Scale (DDS) – для оценки эмоционального дистресса, связанного с диабетом, Diabetes Quality of Life (DQOL) – для оценки

качества жизни, и WHO Disability Assessment Schedule (WHODAS 2.0) – для оценки функциональной инвалидизации.

Статистический анализ проводился с использованием корреляционного анализа и множественной линейной регрессии. Клинически значимая депрессия (PHQ-9 ≥ 10) была выявлена у 29,6% пациентов, тогда как умеренный и высокий уровень диабетического дистресса (DDS ≥ 2,0) наблюдался у 42,4% пациентов.

Выраженность депрессии показала отрицательную корреляцию с показателями качества жизни по шкале DQOL ($r = –0,58$; $p < 0,001$) и положительную корреляцию с уровнем диабетического дистресса по шкале DDS ($r = 0,61$; $p < 0,001$), показателями функциональной инвалидизации по шкале WHODAS ($r = 0,53$; $p < 0,001$) и уровнем гликированного гемоглобина HbA1c ($r = 0,42$; $p < 0,001$). По мере увеличения выраженности депрессии и диабетического дистресса отмечалось достоверное снижение качества жизни и увеличение функциональных ограничений.

Полученные результаты свидетельствуют о том, что депрессия и диабетический дистресс оказывают отрицательное влияние на течение сахарного диабета, контроль гликемии и психосоциальное благополучие пациентов. В связи с этим рекомендуется регулярное использование психометрических инструментов, таких как PHQ-9 и DDS, в клинической практике для скрининга депрессии у пациентов с сахарным диабетом. Комплексный подход к лечению сахарного диабета, включающий не только биологические, но и психосоциальные аспекты заболевания, играет важную роль в улучшении общего состояния здоровья и качества жизни пациентов.

Ключевые слова: сахарный диабет, психические расстройства, депрессия, тревожность, диабетический дистресс, качество жизни, функциональные нарушения, WHODAS, DDS, DQOL, PHQ-9, взрослые 18–65 лет.