Original Article

Psychological Disorders (Anxiety, Nervousness, and Social isolation) Among Diabetic Patients in port Sudan

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Abstract

Background: Diabetes is a common chronic disease characterized by persistent hyperglycemia. The International Diabetes Federation expects the number of affected individuals to reach 783 million by 2045. The psychological aspects of diabetes management are well-documented, particularly in relation to glycemic control and patient outcomes. This study aimed to determine the prevalence of psychological disorders among diabetic patients in Port Sudan.

Methods: This cross-sectional study was conducted among diabetic patients at Ahmed Hassan Center, Port Sudan. Standardized questionnaires, including the GAD-7 for anxiety and the UCLA 3-item scale for loneliness, were used. The Pearson chi-square test was employed to assess associations between variables.

Results: A total of 256 diabetic patients participated in this study, with males comprising 55% of the sample. Of the participants, 28% were aged 41–60 years. The median anxiety score on the GAD-7 was 11, indicating a significant proportion of patients experienced

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moderate-to-severe anxiety. Additionally, 53.9% reported experiencing nervousness sometimes, while 57.4% felt socially isolated, highlighting the prevalence of mental health concerns in this population. A significant association was found between loneliness and nervousness ($p = 0.001$), suggesting that increased loneliness correlates with higher levels of nervousness. Various sociodemographic factors were also associated with loneliness: females were more likely to experience loneliness ($p = 0.013$), whereas being married was linked to lower levels of loneliness (-0.445, $p < 0.001$).

Conclusion: This study underscores the importance of integrating psychological care into routine diabetes management, as poor mental health can exacerbate glycemic control issues, potentially leading to serious complications.

Keywords: chronic hyperglycemia, loneliness, Ahmed Hassan Center, mental disorder

Introduction

Diabetes is a common chronic disease affecting individuals worldwide. It is a collection of metabolic disorders referred to as chronic hyperglycemia, which is brought on by flaws in insulin secretion, action, or both [1] and over time causes major harm to the heart, eyes, blood vessels, and nerves. It is among the most significant global health crisis of the twenty-first century [2]. The numbers of people with the disease are expected to increase from 537 million in 2021 to 642.7 million by 2030 and 783.2 million by 2045 worldwide, and it is one of the top 10 causes of death worldwide[3]. It has become a global public health concern, especially in low and middle-income countries (LMIC) [4].Diabetes mortality rates by age increased by 3% from 2000 to 2019." In 2019, an estimated 2 million people died of diabetes-related kidney disease[3]. Many have suggested including psychological counseling in routine diabetes care as an outcome of physicians' increasing awareness in recent decades of the value of psychological support for individuals with diabetes and their families[5].

The purpose of this study was to determine the prevalence of the psychological disorders among diabetes patients in Port Sudan.

Psychological problems may have a significant impact on glycemic management in patients with diabetes. Poor glycemic control, "brittle diabetes," and diabetic ketoacidosis (DKA) have all been linked to psychological problems; according to the previous studies [6] A study found that 42% of patients with diabetes reported feeling socially isolated, which significantly impacts their mental health[7].Integrating psychological cares with diabetes management have been emphasized by the International Diabetes Federation[3]. Anxiety is a persistent condition marked by psychophysiological symptoms that can arise at any time and disrupt regular daily routines.[8] Nervousness is a mental state marked by anxiety, apprehension, or worry, usually in response to a perceived threat or stressor.[9] Social isolation: For some people, loneliness (the sense of being alone) can result from a lack of social contact. Many people in the United States

suffer from loneliness and social isolation in their later years, which increases their chance of developing dementia and other severe illnesses. Loneliness is linked to increased rates of anxiety, depression, and suicide[10.]

In Africa, studies have shown that approximately 28% of diabetic patients experience anxiety symptoms, highlighting a significant mental health burden [11].A lack of social support has been identified as a significant risk factor for anxiety and depression in diabetic patients, affecting up to 50% of individuals in some African countries [12] Female diabetic patients in Africa are more likely to experience anxiety and depression than their male counterparts, with rates as high as 45% for females compared to 25% for males [13]. Chronic hyperglycemia greatly increases the risk of diabetic micro- and macro vascular problems. Therefore, the goal of diabetes treatment is to maintain adequate glycemic control, and the significance of psychological and other components is appraised in proportion to their influence on the outcome. Even with the availability of excellent diabetes therapy, relatively few individuals maintain blood glucose levels within the range required to prevent complications of the disease, indicating the need for additional management choices[5]. Glycemic control is negatively correlated with anxiety and positively correlated with anxiety therapy, especially in the subgroup of patients who experience more severe anxiety. The potential impact of anxiety management in diabetes requires a more precise assessment of anxiety prevalence than is currently available[14.] Like other long-term, non-communicable diseases, diabetes has a noticeable psychological effect on those who have it, as well as their loved ones[15]. Numerous researches have been conducted to identify the prevalence of DAS (depression, anxiety, and stress) in patients with diabetes, it has been concluded that individuals with diabetes and depression have worse outcomes when it comes to managing their conditions and this immediately impacts the quality of life of patients in addition to placing a significant load on healthcare services and costs.[16]. Access to mental health services for diabetic patients in Africa is limited, with only 10% of patients receiving adequate psychological support [17], Psychological interventions have been found to reduce anxiety and

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depression symptoms in diabetic patients by 40% in African studies, emphasizing the need for integrated healthcare approaches [18]. Studies on the prevalence of DAS and other psychological disorders among patients with diabetes in Sudan are very rare. In comparison to the general population, patients with diabetes in Port Sudan show a notable psychological disorder.

Methods

Study setting and design

This cross-sectional study was conducted from 30th June to 1st august 2024 and aimed to determine the prevalence of psychological illnesses (social isolation, anxiety, and nervousness) among patients with diabetes in Port Sudan.

Study population and sample

This study was conducted at Ahmed Hassan Center for Diabetes. This center, specialized for diabetic patients, is designed for the management and follow-up of diabetic patients, it is located in Port Sudan, and consists of government primary care clinics. Adult patients aged ≥ 18 years who were diagnosed with diabetes mellitus and follow-up at their respective clinics were included in the study. Pregnant diabetic females and patients who have diabetes with other chronic diseases were excluded from the study. The minimum sample size was calculated using the following equation.

$(Z^2 * P * (1-P)) / d^2$

Confidence level (Z), expected prevalence from previous studies (P), and desired precision (margin error) (d). Following the assumptions of a 95% confidence level (CI), an acceptable margin of error of 5%, and an expected frequency of 18% from a similar study conducted in Egypt [19]. The required sample size was 236. Given the lack of previous data on the specific prevalence of anxiety, social isolation, and nervousness among patients with diabetes in Sudan, a conservative estimate of 18% was used to ensure an adequate sample size for capturing potential trends and variations.

Data collection tools and procedures

Data were collected using a self-administered questionnaire that assessed anxiety, nervousness, and social isolation. Anxiety was assessed using General Anxiety Disorder: GAD-7, a score of 0–4 indicates minimal anxiety, 5–9 indicates mild anxiety, 10–14 indicates moderate

anxiety, and more than15—severe anxiety [20]. The maximum score is 21 points, with a higher score indicating a higher symptom burden. A cutoff of more than10 marks a probable diagnosis of anxiety. Social isolation was assessed using the UCLA-3 item Loneliness Scale [21], and patients were screened for study eligibility by trained clinic staff upon registration to see the doctor. They were given a patient information sheet that was made available in a simple language. All participants provided oral informed consent before included in the study. Patients who agreed to participate in the study were given the questionnaire to fill it while awaiting their turn to be seen by the doctor; if the patient illiterate the questionnaire filled out with the help of data collectors they ask the patient questions and write his answer in the questionnaire.

Data processing and analysis

After the data collection, we conducted a comprehensive review to identify and correct inconsistencies, errors, missing values, and Participants that did not meet the inclusion criteria. The data were coded using numerical values (e.g., assigning 1 for males and 2 for females) and then imported into SPSS software version 27 for additional analysis. Pearson chi-square test was used to measure the association between the variables in the study. Significant associations were defined as those with a p-value <0.001.

Ethics approval and consent to participate

The Declaration of Helsinki's criteria were followed in the conduct of this study, and Red Sea University- Research Center Ethics Committee authorized all procedures involving research study participants. Oral informed consent, the voluntary nature of participation, and the confidentiality of replies were obtained before recruiting any individuals.

Results

Sociodemographic characteristics of study participants

A total of 256 patients with diabetes participated in this study, with 142 males (55%) , aged 41-60 years (28%), and married (41%) . Body Mass Index (BMI) majority of Participants were overweight 87 (34%) , the BMI calculated and categorized as follow: below 18.5 underweight, 18.5 to 24.9 healthy weight, 25 to 29.9 overweight and above 30 obese. and undergraduates (30%). About

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the third of participants are housewives 85 (33.2%) then employees 58 (22.7%) "Table 1"

Table 1. Sociodemographic characteristics of study participants

Gender	**Male**			**Female**	
	142 (55%)			114 (45%)	
Age	18-25	26-30	31 – 40	41 - 60	>60 years
	41 (16%)	44 (17%)	66 (26%)	76 (28%)	29 (11%)
BMI	Normal	Thin	Over weight	Obese	
	38 (15%)	54 (21%)	87 (34%)	77 (30%)	
Marital status	Married	Single	Divorced		
	105 (41%)	76 (30%)	75 (29%)		
Educational level	Elementary	Secondary	Undergraduate	Postgraduate	Not educated
	24 (9%)	55 (22%)	78 (30%)	55 (22%)	44 (17%)
Occupation	Employee	Student	Free worker	Housewife	
	58 (22.7%)	57 (22.3%)	56 (21.9%)	85 (33.2%)	

Prevalence of anxiety, social isolation and nervousness

The overall median score on the anxiety subscale was 11. Based on the categorization of participants using the GAD-7, the majority exhibited moderate anxiety (72.3%), and severe anxiety (25.4 %). This indicates that a significant proportion of patients with diabetes experience moderate-to-severe anxiety. The results showed that majority of the patients (53.9%) reported sometimes experiencing nervousness. The analysis revealed that 147(57.4%) of the participants reported feeling socially isolated and 56 (21.9%) stated that they sometimes felt isolated. "Table 2"

Table 2. Prevalence of anxiety, social isolation and nervousness among study populations

	Numbers	Percentage (%)
Anxiety		
Minimal anxiety	1	0.4
Mild anxiety	5	2.0
Moderate anxiety	185	72.3
Severe anxiety	65	25.4
Total	256	100.0
Social isolation (loneliness)		
Always	147	57.4
Sometimes	56	21.9
Never	53	20.7
Total	256	100
Nervousness		
Always	67	26.2
Sometimes	138	53.9
Never	51	19.9
Total	256	100

Factors affecting Psychological Disorders

Gender: The Social Isolation correlation factor was 0.155 ($p = 0.013$), indicating a positive correlation between being female and experiencing social isolation. Age: Social Isolation correlation factor of -0.226 ($p < 0.001$), suggesting that older age is associated with lower levels of social isolation. BMI: Nervousness was significantly negatively correlated (correlation factor = -0.293, $p < 0.001$). Anxiety Diagnosis there is significant

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negative correlation (correlation factor = -0.264, p < 0.001). Marital Status: Social Isolation showed a significant negative correlation (correlation factor = -0.445, p < 0.001), indicating that being married is associated with lower social isolation. Nervousness was positively correlated (correlation factor = 0.182; p = 0.004). Educational Level: There significant positive correlation between social isolation and educational level (correlation factor = 0.312, p < 0.001). There was a significant negative correlation between nervousness and level of education (correlation factor = -0.465, p < 0.001). Occupation: There was a significant negative correlation between occupation and social isolation (correlation factor = -0.513, p < 0.001). Social Isolation and Nervousness: There correlation factor of -0.208 (p = 0.001), indicating that increased social isolation is associated with higher levels of nervousness. “Table 3”

Table 3. Factors Influencing Psychological Disorders:

	Social isolation(loneliness)	**Nervousness**	**Anxiety diagnosis**
Gender			
Correlation factor	.155	0.013	0.083
Significance	0.013	0.835	0.184
Age			
Correlation factor	-.226	0.081	0.091
Significance	<0.001	0.197	0.147
BMI			
Correlation factor	0.012	-.293	-.264
Significance	0.849	<0.001	<0.001
marital status			
Correlation factor	-.445	.182	0.104
Significance	<0.001	0.004	0.096
educational level			
Correlation factor	.312	-.465	-0.067

Significance	<0.001	<0.001	0.289
Occupation			
Correlation factor	-.513	0.022	-0.076
Significance	<0.001	0.721	0.223
Social isolation (loneliness)			
Correlation factor	1	-.208	0.033
Significance		0.001	0.601

Table. 4 Factors affecting anxiety prevalence among study participants

	Anxiety	
Variables	**Correlation factor**	**P value**
Gender	0.083	0.184
Age	0.091	0.147
BMI	-0.264	<0.001
Marital status	0.104	0.096
Educational level	-0.067	0.289
Occupation	-0.076	0.223
Social isolation	0.033	0.601

Discussion

This study identifies the prevalence and interrelationship of psychological disorders specifically anxiety, nervousness, and social isolation—among diabetic patients in Port Sudan, revealing

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concerning trends that underscore the need for targeted mental health interventions. According to the results of the study we found that a high prevalence of anxiety (72.3% moderate and 25.4% severe), alongside notable levels of nervousness (26.2% always and 53.9% sometimes) and social isolation (57.4% always and 21.9% sometimes). The prevalence of anxiety among diabetic patients in this study is alarming, with 97.7% experiencing at least mild anxiety. This finding aligns with previous research indicating that chronic illnesses, particularly diabetes, are associated with elevated anxiety levels [22]. Diabetes management often requires constant caution, which can lead to increased anxiety due to concerns about blood sugar levels and potential complications. The finding of a correlation factor of -0.208 between social isolation and nervousness indicates a moderate inverse relationship. This means that as levels of social isolation increase, the levels of nervousness tend to be higher, this suggests that individuals who feel more socially isolated are more likely to experience nervousness, potentially due to a lack of social support and engagement. The significance of the p-value (0.001) reinforces that this correlation is statistically significant, highlighting the urgency of addressing social isolation in diabetic patients to prevent increased nervousness. This bidirectional relationship underscores the psychological impact of loneliness, where the experience of being alone can lead to heightened anxiety states, creating a cycle that may worsen both social isolation and nervousness. “Table 4”

The sociodemographic data highlights that a majority of the sample were males (55%), with a significant proportion (28%) aged between 41 to 60 years. This demographic profile is crucial as it suggests a potential vulnerability within middle-aged males towards psychological distress, which has been corroborated by recent studies indicating that age and gender significantly influence mental health outcomes [23]. Notably, the study found a positive correlation (0.155) between being female and experiencing social isolation, emphasizing the need for targeted interventions to support female patients in coping with social isolation, a factor that can exacerbate anxiety [24].Interestingly, the analysis revealed that older age was associated with lower levels of social isolation (correlation factor -

0.226), suggesting that older individuals may have more established social networks or coping mechanisms. This contrasts with findings from other studies which suggest that older adults often face increased loneliness due to retirement and loss of social roles [25].Moreover, the study identified that marital status significantly influenced social isolation, with married individuals exhibiting lower levels of isolation (correlation factor -0.445). This underscores the protective effect of intimate relationships on mental health, aligning with literature that advocates for social support as a buffer against anxiety [26].Educational level also emerged as a critical factor, with a significant positive correlation between higher educational attainment and social isolation (correlation factor 0.312), which may reflect the complexity of social interactions and the potential for higher educated individuals to have different social expectations or networks [27].Lastly, the relationship between occupation and social isolation was notably strong (correlation factor -0.513), indicating that employment may serve as a crucial factor in maintaining social connections. This finding supports the argument that employment not only provides financial stability but also fosters social engagement, which is essential for psychological well-being [28].

This study identified a high prevalence of psychological disorders among diabetic patients; there is a pressing need for integrated care approaches that address both physical and mental health in diabetic patients. Healthcare providers should routinely screen for anxiety, nervousness, and social isolation during diabetes management visits.Implementing psychological support services, such as counseling or support groups, could significantly improve the quality of life for these patients.

This study significantly contributes to understanding the psychological challenges faced by diabetic patients in Port Sudan. This is the first study to assess the psychological disorders, particularly anxiety, social isolation, and nervousness, among diabetic patients in Port Sudan. It is also one of the fewest studies to assess those disorders among targeted patients in Africa and Sudan. This documentation may guide interventions and serve as a reference for psychological challenges faced by diabetic patients.

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The findings of this study, however, should be viewed in light of the convenience sampling limitation. The cross-sectional nature of the study is the important limitation. While it can identify associations between psychological disorders and diabetes management, it cannot determine whether mental health issues lead to poor glycemic control or vice versa. So adopting a longitudinal design would be more appropriate for establishing temporal or causal relationships and including other psychological disorders could enhance the understanding and management of psychological disorders in diabetes care.

Conclusion and Recommendations

We found a significant prevalence of psychological disorders among diabetic patients in Port Sudan. This indicates that a considerable portion of this population faces mental health challenges, which likely complicate their diabetes management. The correlation between psychological disorders and glycemic control highlights the crucial role of mental health in managing chronic conditions such as diabetes. As discussed, psychological issues can lead to poor glycemic control, which, in turn, increases the risk of serious complications like diabetic ketoacidosis. Therefore, integrating psychological support into routine diabetes care is not only beneficial but necessary to improve health outcomes for these patients. Based on our findings, we recommend that healthcare systems implement screening for psychological disorders as part of standard diabetes care. Additionally, providing access to mental health resources, including counseling and support groups, could significantly enhance the quality of life for diabetic patients and improve their health outcomes.

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Competing interests

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

Data availability

Availability of data and materials the datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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