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Original Research

The Role of the Diabetes Anxiety Depression Scale among Patients with Type 2 Diabetes Mellitus

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Abstract

Background and Aim: Studies have demonstrated a connection between diabetes and depression. Diabetes and anxiety or depression each contribute to higher rates of illness and death on their own. The objective of the study was to examine the prevalence of anxious depression among diabetic patients and to explore the relationship between glycaemic control, the duration of diabetes, and this mental health condition.

Material and Methods: The current study took place at the Department of General Medicine within a Tertiary Care Teaching Institute in India, spanning a duration of one year and involving 180 inpatients who were admitted to the hospital. Patients underwent evaluation using the diabetes anxiety depression scale, and their scores were subsequently calculated. The length of time a patient has been living with diabetes, along with their recent HbA1c levels, was recorded. Every patient underwent the PHQ-9 assessment, which includes nine items that align with the nine criteria for major depression as outlined in the DSM-5.

Results: The study subjects were evaluated using the Diabetes Anxiety Depression Scale. Nearly 30% of the participants in the study achieved scores lower than 8. A score below 8

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indicates the absence of anxious depression. Forty percent of the participants achieved scores ranging from 8 to 17. The score ranging from 8 to 17 indicates the presence of mild anxious depression.31.1% of participants achieved scores ranging from 18 to 39. A score ranging from 18 to 39 indicates the presence of significant anxious depression. The average score achieved by the participants in the study was 13.04. In individuals exhibiting relatively stable glycaemic control. A total of 32 individuals, representing 43.83%, scored between 8 and 17. Meanwhile, 16 individuals, or 21.91%, scored below 8, and 25 subjects, accounting for 29.2%, scored between 18 and 39. The majority of subjects exhibiting relatively good glycaemic control also displayed mild symptoms of anxious depression.

Conclusion: the analysis revealed no statistically significant differences in glycaemic variability when examining the spectrum of anxious depression. The DADS score demonstrated a positive correlation with advancing age. Tracking biochemical parameters such as HbA1c, postprandial blood glucose levels, and BMI may serve as indicators for the development of anxiety in these patients.

Key Words: Anxiety, Diabetes, Depression, Glycaemic Control

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Introduction

Diabetes mellitus represents a chronic and progressive metabolic disorder that is swiftly contributing to a growing pandemic of noncommunicable diseases in the Indian Subcontinent.[1] Depression frequently occurs among individuals with type 2 diabetes, yet there remain uncertainties about its characteristics and the best approaches for screening.[2,3] Depression is increasingly recognised as a common co-morbid condition in individuals with Type 2 diabetes. This association is concerning, as it has been linked to poorer health outcomes, including a heightened risk of mortality.[4] The stigma surrounding mental health conditions often complicates the effective treatment of depression symptoms. Elevated glucose levels seem to correlate with unfavourable mood assessments.[5.6] The presence of a metabolic condition that necessitates strict lifestyle modifications for effective management can be significantly hindered by the debilitating effects of depression, ultimately impacting diabetes control. The interplay between untreated mental health conditions and diabetes is concerning, as each can exacerbate the other, leading to a cycle that can significantly impact overall well-being. Individuals diagnosed with diabetes face a significantly higher risk of experiencing depression, with studies indicating they are 2 to 3 times more likely to be affected compared to those without the condition. Previous studies conducted in India have linked diabetes to a diminished quality of life.[7.8] Furthermore, Indian authors have explored the impact of stress and

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psychosocial factors on diabetes management.[9,10] Only 25% to 50% of individuals with diabetes and depression receive a proper diagnosis and treatment.[11,12] Various environmental factors could potentially trigger shared pathways that ultimately contribute to the development of type 2 diabetes and depression.[13] Key contributors include low socioeconomic status, inadequate sleep, insufficient physical activity, and dietary choices. Considering these factors, a significant contender for a shared pathway may be the activation and disruption of the stress system. The ICD-10 marked a significant milestone in 1992 by introducing the diagnosis of "mixed anxiety-depression." This development was driven by increasing evidence highlighting the common occurrence of co-morbid anxiety and depression in patients who did not fully satisfy the criteria for either condition. Their degree of disability was similar to that observed in individuals experiencing full syndromal depression and anxiety. Research indicates that anxiety often coexists with depression more frequently than anticipated, exacerbating depressive symptoms and heightening the risk of suicide. These findings carry significant implications for clinical practice.

The diabetes anxiety depression scale (DADS) serves as a valuable tool for identifying anxious depression among individuals with type 2 diabetes in clinical settings.[14] A total of 14 participants with Type 2 diabetes from the observational community-based Fremantle Diabetes Study Phase II were evaluated for lifetime depression through the brief lifetime depression scale. Additionally, current depression symptoms were assessed using the 9-item version of the Patient Health Questionnaire (PHQ-9), alongside the Generalised Anxiety Disorder Scale, which was specifically designed and validated for this research. The objective of the study was to investigate the prevalence of anxious depression among diabetic patients and to examine the relationship between glycaemic control, the duration of diabetes, and the incidence of this mental health condition.

Material and Methods

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A prospective observational study was conducted in the Department of General Medicine at a Tertiary Care Teaching Institute in Gujarat, India, over a period of six months. The study focused on adult patients who were admitted to the hospital and had a prior diagnosis of diabetes.

The current study established specific inclusion criteria: participants must be adults over 18 years of age, hospitalised during the study period, and have a diagnosis of type 2 diabetes for at least one year prior to admission.

Upon admission, essential data was gathered, including patient demographics such as age, sex, and BMI, along with medical and social history and any pre-existing comorbidities. The duration of diabetes, the medications the patient is taking, and the HbA1c levels were gathered for analysis. A research investigation was carried out involving 180 inpatients who were admitted to the hospital.

Patients underwent evaluation using the diabetes anxiety depression scale, and their scores were subsequently calculated. Information regarding the length of diabetes and the latest Hba1c readings was recorded. Every patient underwent the PHQ-9 assessment, which includes nine items that align with the nine DSM-5 criteria for major depressive disorder. Symptoms are assessed on a scale from 0 to 3: 0 indicates the symptom is absent, 1 signifies the symptom has been present for several days, 2 reflects the symptom occurring for more than half the days, and 3 denotes the symptom is present nearly every day. In the current investigation, the cumulative PHQ-9 score was combined with the scores from the four GADS items, which include worrying, feeling irritable, muscle tension, and restlessness.

Statistical analysis

The collected data was organised and input into a spreadsheet application (Microsoft Excel 2019) before being transferred to the data editor interface of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Quantitative variables were characterised using means and standard

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deviations or medians and interquartile ranges, depending on their distribution patterns. Qualitative variables were reported in terms of counts and percentages. The confidence level for all tests was established at 95%, while the level of significance was determined to be 5%.

Results

In the study, a total of 102 participants, representing 56.5%, were male, while 78 participants, accounting for 43.3%, were female. The study population comprised various age groups. The highest proportion of subjects, specifically 31.11%, fell within the age range of 51 to 60 years. The age group of 31-40 years had the fewest number of subjects. A significant portion of the study participants, specifically 55.5%, were identified as having been affected by Type 2 diabetes mellitus for over a decade.11.11% of the participants were identified as having Type 2 diabetes mellitus for a duration of less than 5 years. Among individuals with diabetes mellitus for over a decade, 52.2% of males exhibited poor control of their condition, while the figure was notably higher at 66.6% for females.

The study evaluated glycaemic control among participants by measuring their HbA1C levels. It was found that 52.5% of individuals exhibited poor glycaemic control, defined as a HbA1C value of 8% or higher. Forty percent exhibited relatively good glycaemic control, indicated by a HbA1C value ranging from 6.2% to 7.5%.6.02% exhibited good glycaemic control, defined as a HbA1C value of 6.45% or lower. The study subjects exhibited a mean HbA1C of 8.50.

Among the participants in the study, as assessed by the Diabetes Anxiety Depression Scale. Nearly 30% of the participants in the study achieved scores lower than 8. A score below 8 indicates the absence of anxious depression. Forty percent of the participants achieved scores ranging from 8 to 17. The score ranging from 8 to 17 indicates the presence of mild anxious depression. Among the participants, 31.1% achieved scores ranging from 18 to 39. A score ranging from 18 to 39 indicates a significant presence of anxious depression. The average score achieved by the participants in the study was 13.04.

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The research evaluated the relationship between glycaemic control and the overall score among the participants. Among individuals exhibiting effective glycaemic management, defined by a HbA1C of 6.5 or lower, 50% were identified with scores ranging from 8 to 17, suggesting the presence of mild anxious depression. 1 (10%) were identified as scoring between 18-39, which suggests the presence of significant anxious depression. Four subjects, representing 40% of the sample, scored below 8, which suggests the absence of anxious depression. The majority of individuals exhibiting effective glycaemic control also experienced mild symptoms of anxious depression. In individuals exhibiting relatively stable glycaemic control, as indicated by a HbA1C range of 6.5 to 7.9. A total of 32 individuals, representing 43.83%, scored between 8 and 17, which suggests the presence of mild anxious depression. Sixteen individuals, representing 21.91%, scored below 8, which suggests the absence of anxious depression. Out of the participants, 25 individuals, representing 29.2%, scored between 18 and 39, which suggests the presence of significant anxious depression. The majority of participants exhibiting relatively good glycaemic control also displayed mild symptoms of anxious depression. In individuals exhibiting inadequate glycaemic management, characterised by a HbA1C level of 8 or higher. A total of 24 individuals, representing 31.77%, scored between 18 and 39, which suggests the presence of significant anxious depression. A total of 37 subjects, representing 34.57%, were identified as scoring between 8 and 17, which suggests the presence of mild anxious depression. A total of 36 subjects, representing 33.64%, were identified as having scored.

Table 1: Gender wise Distribution of study Population

Gender	Number	Percentage (%)
Male	102	56.6
Female	78	43.3
Total	180	100

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Table 2: Association between glycaemic control and DADS score (n=180)

HbA1c	Total Score n (%)		
	<8	**8-17**	**18-39**
Good	4 (40)	5 (50)	1 (10)
Fairly Good	16 (21.91)	32 (43.83)	25 (29.2)
Poor	36 (33.64)	37 (34.57)	34 (31.77)
Mean (SD)	10.48 ±8.45	13.26± 8.12	12.05± 8.06

Discussion

The average HbA1C levels among participants without anxious depression, those with mild anxious depression, and those with major anxious depression were recorded at 8.66, 8.54, and 8.60, respectively. The analysis revealed no statistically significant differences in glycaemic variability when examining the spectrum of anxious depression. Anxiety, depression, and disease-related distress are commonly associated with poorer glycaemic control, as evidenced by elevated HbA1C levels. The connection between psychological issues and complications related to diabetes remains somewhat unclear. However, long-term fluctuations in blood sugar levels may serve as a potential bridge linking these two conditions. This is particularly relevant as mood and anxiety disorders can lead to notable variations in how individuals adhere to treatment and manage their self-care routines.[15]

Research indicates that a higher prevalence of anxious depression is observed among male subjects in comparison to females. In a recent analysis, it was observed that males exhibited a higher score on the Diabetes Anxiety Depression scale compared to their female counterparts. This phenomenon can be linked to the variations in coping mechanisms and the ways in which individuals report their symptoms based on gender. Depression in men often goes unrecognised

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and inadequately addressed, yet our current study revealed a notable prevalence among males.[16] A prior investigation conducted by Roupa et al. (2009)[17] indicated a significant correlation between sex and the prevalence of anxiety and depression symptoms, revealing that women exhibited anxiety symptoms at rates three times higher than those observed in men. Moreover, the evidence strongly indicates that women experiencing symptoms of depression are affected at nearly double the rate compared to men. The current study found that as age increases, there is a positive correlation with anxious depression among individuals with diabetes. Individuals in their later years often face life stressors that are familiar to many, yet they also encounter challenges that are particularly prevalent in this stage of life, such as enduring losses in abilities and a decrease in functional capacity.[13] The length of time a person has diabetes shows a positive correlation with their DADS score.

Women diagnosed with type 2 diabetes mellitus exhibited poorer glycaemic control compared to their male counterparts. Several factors may contribute to the observed disparities in glycaemic control between women and men. These include variations in the regulation of glucose homeostasis, differences in treatment responses, and the influence of psychological factors. Furthermore, women exhibited greater challenges than men in conducting glucose self-measurements and managing ongoing hyperglycaemia, resulting in overall poorer glycaemic control.[18, 19] In women, the decline in oestrogen levels following menopause is associated with a rise in blood glucose levels. Conversely, in men, higher oestrogen levels could potentially contribute to insulin resistance. Metabolic differences between men and women play a significant role in the pharmacodynamics of medications prescribed for the treatment of type 2 diabetes.

The study's limitations stem from its cross-sectional design, which restricts the ability to make long-term conclusions. Secondly, the research involved a limited number of participants and

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was conducted in a specialised medical facility, which means the findings may not be applicable to the broader population.

Conclusion

Diabetes mellitus represents a persistent health issue that has shown a concerning upward trajectory in prevalence over the years. No statistically significant difference was observed in glycaemic variability across the spectrum of anxious depression. The DADS score exhibited a positive correlation with advancing age. Research indicates that male diabetic patients experience higher levels of anxious depression compared to their female counterparts. Women with diabetes experienced less effective management of their condition over extended durations. Tracking biochemical indicators such as HbA1c, postprandial blood glucose levels, and BMI may serve as a valuable tool in understanding the progression of anxiety among these patients. Moreover, engaging in physical exercise appears to offer a protective benefit against anxiety for individuals diagnosed with type 2 diabetes mellitus.

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