

A study on Diabetes distress and depression in type 2 diabetes patients.

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Abstract: This cross-sectional study investigated the relationship between diabetes distress and depression among 80 type 2 diabetes patients aged above 45 years in Dindigul, Tamil Nadu. Recruited from a local diabetes centre via convenience sampling, participants were evaluated to address the critical need for understanding psychological challenges that hinder effective diabetes management. Data collection utilized the Diabetes Distress Scale (DDS-17)—which measures emotional burden, regimen distress, interpersonal distress, and physician distress—alongside the CES-D-10 to assess general depressive symptoms. Following institutional ethical approval and the acquisition of informed consent, statistical analyses were executed using SPSS software, applying Spearman correlation, the Mann-Whitney U test, and Chi-square tests. The analysis revealed a significant positive correlation between diabetes distress and depression, with notable gender differences observed in depression severity, where females scored higher, though overall distress levels did not differ significantly by gender. Ultimately, these findings underscore the vital importance of incorporating routine early screening, comprehensive psychosocial support, and gender-sensitive interventions into standard care to improve patient mental health and medical outcomes.

Index terms: Type 2 diabetes, diabetes distress, depression, gender differences, psychosocial support, DDS-17, CES-D-10

I. INTRODUCTION

Type 2 diabetes is a chronic condition with rising prevalence worldwide, including India, where rates range from 2.4% to 11.6%. Beyond its physical complications, patients often face significant psychological challenges such as depression and diabetes distress. These mental health issues affect self-care, disease management, and overall quality of life, increasing risks of poor outcomes and mortality. Diabetes distress is distinct from depression, though they may overlap, and both require careful evaluation and management.

Diabetes distress refers to the emotional burden of living with diabetes, including stress about long-term complications, guilt when management goes off track, and frustration with constant self-care demands. It can manifest differently in type 1 and type 2 diabetes, with type 1 patients often worried about hypoglycemia and complications, while type 2 patients struggle more with lifestyle restrictions and social consequences. If untreated, distress can escalate into depression, leading to poorer glycemic control, reduced adherence to treatment, and impaired quality of life.

Depression, meanwhile, is a mood disorder characterized by persistent sadness, hopelessness, and loss of interest, affecting thoughts, behavior, and physical health. It is influenced by biological, psychological, and social factors, and can coexist with diabetes distress. While depression is recognized as a psychiatric illness, diabetes distress is considered a natural emotional response to the demands of diabetes management. Together, they highlight the importance of addressing both physical and psychological aspects of diabetes care to improve patient outcomes.

The aim of this study is to investigate the presence and extent of diabetes distress and depression among patients with type 2 diabetes, focusing on how these psychological conditions affect self-care and disease management. It also seeks to measure their levels, explore the relationship between them, and examine gender differences, thereby providing insights into the emotional and mental health challenges faced by individuals living with type 2 diabetes.

AIM & OBJECTIVES OF THE STUDY

The aim of this study is to investigate diabetes distress (DD) and depression among individuals with type 2 diabetes.

- To measure the level of Diabetes distress(DD) among T2 diabetes patients.
- To measure the level of depression among T2 diabetes patients.
- To verify the relationship between diabetes distress and depression among T2 diabetes patients.
- To identify the relationship of higher the Depression higher will be the Emotional burden, Physician related distress, Regimen related distress, and Interpersonal distress.
- To verify the difference regarding the gender of the participants and the study variables.

NEED OF THE STUDY

Firstly, diabetes may be a constant condition that influences millions of individuals around the world, and T2 diabetes is the foremost common type. It has been well-established that people with diabetes are at an expanded chance of creating misery and other mental well being issues, which can adversely affect their quality of life and infection administration. Besides, diabetes trouble may be a moderately modern concept that has picked up consideration in later a long time.. Thirdly, current survival data is vital to get it the effect of diabetes trouble and sadness on the long-term results of people with T2 diabetes.

A BACKGROUND

Beverly, E. A., Ritholz, M. D., & Dhanyamraju, K. (2021),[1] the researchers made research on” The buffering effect of social support on diabetes distress and depressive symptoms in adults with T1 and T2 diabetes” [1][2]. This study examined how social support can help people with T1 and T2 diabetes manage their diabetes distress and depressive symptoms. The researchers found that having more social support can help buffer the negative effects of diabetes distress and depressive symptoms on self-care. This means that having people who can offer tangible, affectionate, emotional, and positive interaction support can help people with diabetes better manage their condition. These findings could help healthcare providers improve clinical care and outcomes for people with diabetes.[8]

Orben, (2022), the researchers made a research on “Differences and similarities in the experience of living with diabetes distress: A qualitative study of adults with type 1 and type 2 diabetes [3]“ and the study aimed to understand how adults with type 1 and type 2 diabetes experience diabetes distress (DD), and to identify similarities and differences in these experiences. They interviewed 19 people with type 1 diabetes and 29 people with type 2 diabetes and found three themes: experiencing diabetes distress as a lack of control, experiencing diabetes distress as a burden of constant management, and understanding the value of social support in diabetes distress. [3]They discovered that type 1 and type 2 participant had similarities and differences in their experiences of DD. The study suggests that treatment for people with each type of diabetes should be tailored based on their experiences.

The consider can give important experiences into the relationship between diabetes trouble and depression and their impacts on dreariness and mortality rates among people with T2 diabetes. In rundown, a ponder on the "relationship between diabetes trouble and misery among T2 20 diabetes patients" with the seriousness of diabetes trouble and sadness among people with T2 diabetes and their effect on long-term wellbeing results[4] [5].

Whereas there have been considerations on the relationship between diabetes and sadness, there's a need of investigate on the particular part of diabetes trouble in contributing to sadness among people with T2 diabetes[6] [7]

HYPOTHESIS

H1: Diabetes Distress and Depression Relationship, This is a hypothesized positive correlation. It states that changes in diabetes distress levels will correspond with changes in depression levels. Typically, this implies that as the emotional strain of managing diabetes increases, general depressive symptoms will also increase.

H2: Gender Differences in Diabetes Distress, This is a hypothesis of difference. It states that a person's biological sex or gender identity will impact how much diabetes distress they experience. It compares two distinct groups (males and females).Categorical independent variable (Gender) and Continuous dependent variable (Diabetes Distress score).

H3: Gender Differences in Depression ,This is another hypothesis of difference. It states that biological sex or gender identity will impact overall depression scores. It compares males and females. Categorical independent variable (Gender) and Continuous dependent variable (Depression score).

H4: Depression as a Predictor of Diabetes Distress Subscales, This is a directional, multi-variable hypothesis. It breaks down "Diabetes Distress" into its four standard subscales (Emotional burden, Physician-related, Regimen-related, and Interpersonal distress) based on the Diabetes Distress Scale (DDS). It states that higher depression scores directly relate to higher scores in all four specific areas of diabetes-specific stress.

II. METHODOLOGY

The researcher conducted a cross-sectional study at a specialized diabetes centre to evaluate diabetes distress and depression levels among diabetic patients, adhering strictly to standard ethical protocols. Utilizing a non-probability convenience sampling technique for its high accessibility and ease of data collection, a sample of 80 older adult participants was selected. This sample population included both male and female participants, serving as a representative subset to draw insights about the broader diabetic community.

Table 1. Sample selection Criteria

SAMPLE SELECTION CRITERIA	
Inclusion Criteria	Exclusion Criteria
Age: above 45	Type 1 diabetes patients
Gender: Both males and females	Severe diabetes complications (Eye damage, Hearing impairment, Alzheimer’s disease, etc.,)

Smoking, Alcohol	Diagnosis of physiological disorder except for depression or psychosis or dementia
Diabetes patients with Blood pressure, Heart attack	

OUTCOME MEASURES

-The Diabetes Distress Scale (DDS-17) is a 17-item self-report tool designed to measure the emotional burden, regimen-related distress, interpersonal distress, and physician-related distress experienced by patients with diabetes. Each item is rated on a 6-point scale, and the mean item score is calculated. A mean score of ≥ 3 is considered clinically significant, indicating moderate to high levels of distress that warrant clinical attention.

-The Center for Epidemiologic Studies Depression Scale, 10-item version (CES-D-10) is used to assess depressive symptoms. It includes items on depressed affect, somatic symptoms, and positive affect (reverse-scored). The total score ranges from 0 to 30, with higher scores reflecting greater severity of depressive symptoms. This tool provides a quick and reliable measure of depression in patients with type 2 diabetes.

III. PROCEDURE

The study procedure commenced with securing formal ethical approval from the relevant review board, followed by administrative permission from the director of the specialized diabetes centre- Sri Vari Diabetic centre in Dindigul to access the target population. Data collection was conducted in the outpatient waiting area of the Sri Vari clinic, where the researcher approached older adult patients waiting for their appointments. Individuals were screened based on inclusion criteria, verifying they had a confirmed diabetes diagnosis, met the age threshold for older adults, and possessed the cognitive capacity to complete the survey. Eligible patients were provided with an information sheet outlining the purpose, voluntary nature, and confidential handling of the study, and formal informed consent was obtained prior to participation. Participants were then administered a paper-based questionnaire packet containing demographic questions, a standardized diabetes distress scale, and a depression inventory, which they completed independently while waiting for their physician. The researcher remained present to assist individuals with visual or literacy challenges and immediately checked completed forms for missing responses upon collection. Finally, to ensure data security, all collected packets were anonymized using alphanumeric codes, the physical forms were locked away securely, and the data from the 80 participants was digitized into statistical software for analysis.

IV. DATA ANALYSIS

Table II Test of a significant relationship between Diabetes Distress and Depression

H1 There will be a significant relationship between Diabetes distress and Depression. Spearman's coefficient of correlation results for the relationship between Diabetes distress (DD) and Depression (D), (N=80)

Variables	Depression	Sig. (2- tailed)	Interpretation
Diabetes distress	.590**	.000	Significant

** . Correlation is significant at the 0.01 level (2-tailed).

It shows that the level of Diabetes distress for males (N=42, Mean Rank= 35.76) is lower than the level of Diabetes distress for females (N= 38, Mean Rank= 45.74) and the difference is not statistically significant ($P < .055$, $U = 599$, $Z = -1.918$). This result indicated that there is no significant difference regards to Diabetes distress. Hence, H2 is rejected.

Table III Mann Whitney U test of gender difference about Diabetes distress

H2 There will be a significant gender difference in Diabetes distress. Mann Whitney U test of gender difference about Diabetes distress. (N=80)

Gender	N	Mean Rank	U	Z	Asymp. Sig. (2-tailed)	Interpretation
Male	42	35.76	599.000	-1.918	.055	Not significant
Female	38	45.74				

It shows that the level of Diabetes distress for males (N=42, Mean Rank= 35.76) is lower than the level of Diabetes distress for females (N= 38, Mean Rank= 45.74) and the difference is not statistically significant ($P < .055$, $U = 599$, $Z = -1.918$). This result indicated that there is no significant difference regards to Diabetes distress. Hence, H2 is rejected.

Table IV Mann Whitney U test of gender difference in Depression

H3 There will be a significant gender difference in Depression.

Gender	N	Mean Rank	U	Z	Asymp. Sig. (2-tailed)	Interpretation
Male	42	27.05	233.000	-5.456	.002	significant
Female	38	55.37				

It shows that the level of Depression for males (N=42, Mean Rank= 27.05) is lower than the level of Depression for females (N= 38, Mean Rank= 55.37) and the difference is statistically significant ($P < .002$, $U = 233$, $Z = -5.456$). This result indicated that there is a significant difference regards to depression. Hence, H3 is accepted.

Table V Spearman's coefficient of correlation matrix results for the relationship between Depression and Diabetes distress subscales

H4 The higher the Depression higher will be the Emotional burden, Physician related distress, Regimen related distress, and Interpersonal distress.

Spearman's coefficient of correlation matrix results for the relationship between Depression and Diabetes distress subscales (EB, PD, RD, ID)

Variables	D	EB	PD	RD
D				
Emotion (EB)	.402**			
Physician (PD)	.398**	.098		
Regimen (RD)	.408**	.408**	.300**	
Interpersonal (ID)	.426**	.141	.404**	.461**

** $p < 0.01$ (2-tailed); * $p < 0.05$; N=80; D- Depression

The table represents the correlations among five variables. Each in the table shows the correlation coefficient between two variables and the corresponding significant level (2tailed), along with the sample size (N) of 80. Depression and Emotional burden are positive (.402) and significant ($p < 0.01$). Depression and Physician related distress is positive (0.398) and significant ($p < 0.01$). Depression and Regimen related distress is positive (.426) and significant ($p < 0.01$). Depression and Interpersonal distress are five (0.426) and significant ($p < 0.01$), indicating a moderate positive relationship among the five variables and Interpersonal distress has a more positive relationship with depression to comparing other subscales. This result indicates there is a significant relationship between depression and Diabetes distress subscales. The higher the depression is higher the diabetes distress dimension. Hence, H4 is accepted.

RESULTS

This study confirms a significant positive correlation between Type 2 diabetes distress and depression ($r=.590$), ($p<.001$), with higher distress levels strongly associated with increased depressive symptoms. While no significant gender difference was found for overall diabetes distress ($p=.055$), females reported significantly higher levels of depression ($p<.001$) compared to males, and higher depression scores correlated directly with increased distress across all subscales, particularly interpersonal distress.

DISCUSSION: The study revealed a statistically significant, moderate-to-strong positive correlation between diabetes distress and depression among Type 2 diabetes patients ($r = .590$), ($p < .001$). This finding confirms that as the psychological burden and daily strain of managing diabetes escalate, patients experience a corresponding increase in general depressive symptoms. This bidirectional relationship is often driven by the emotional exhaustion of handling a chronic illness, paired with the fact that depressive symptoms—such as fatigue and low motivation—severely hinder effective self-care, creating a cyclical baseline of distress. Regarding gender differences, the data showed no statistically significant variance between males and females concerning overall diabetes distress ($p = .055$). Although females exhibited a slightly higher mean rank score ((45.74)) than males ((35.76)), the difference did not cross the threshold of statistical significance, suggesting that both genders cope with a comparable level of stress regarding treatment regimens and physician interactions. Conversely, a highly significant gender difference emerged for depression ($p < .001$), with females scoring a substantially higher mean rank ((55.37)) than males ((27.05)), aligning with broader global trends that highlight a higher prevalence of depressive disorders among females. Finally, the investigation validated that higher levels of depression directly compound specific operational dimensions of diabetes distress. Significant positive correlations ($p < .01$) were found between general depression and all individual subscales of the Diabetes Distress Scale, including emotional burden, physician-related distress, regimen-related distress, and interpersonal distress. Notably, interpersonal distress demonstrated the strongest correlation with depression, suggesting that a lack of social support and friction within personal relationships exert the most profound negative impact on the mental health of diabetic patients.

CONCLUSION

The study provides evidence for a significant positive correlation between diabetes distress and depression in type 2 diabetes patients. This suggests that experiencing distress related to diabetes management can harm mental health outcomes. Additionally, the study found a significant gender difference in diabetes distress, indicating that female patients may be more susceptible to experiencing distress related to their diabetes.

However, further research is needed to explore the mechanisms and factors that contribute to the relationship between diabetes distress and depression, as well as the effectiveness of interventions for these conditions in this population. Clinicians and healthcare providers should be aware of the potential for diabetes distress and depression to co-occur and should consider implementing interventions that address both conditions in their patients with type 2 diabetes.

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