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Original Research Article

A CROSS SECTIONAL STUDY OF PSYCHOLOGICAL WELL-BEING OF PATIENTS WITH TYPE II DIABETES MELLITUS

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ABSTRACT

Background: Type II diabetes mellitus (T2DM) is a growing global health issue linked to physical as well as psychological challenges. The chronic nature of T2DM, lifestyle demands, and complications contribute to mental health burdens. There is a pressing need to assess psychological well-being of patients with T2DM. Comprehensive care of patients with T2DM should address both physical and psychological well-being in patients.

Materials and Methods: This cross sectional study assessed the psychological well-being of 80 T2DM patients at a tertiary care institute using the Diabetes Distress Scale (DDS). Demographic details, diabetes duration, medications, and comorbidities were documented. Participants rated distress levels on a 1-6 scale. Data were analyzed with SPSS software, employing paired t-tests for quantitative data and Chi-square tests for qualitative data. A p-value < 0.05 was considered statistically significant.

Results: This study analyzed 80 T2DM patients, revealing a male predominance (65%) and an average age of 54.57 years. The majority were overweight or obese, with a mean BMI of 28.96. Socioeconomic status and education levels varied. Distress levels as assessed by diabetes distress scale ranged from no distress (22.50%) to severe distress (21.25%), with an overall mean DSS score of 3.01. Females, older age, higher BMI, longer diabetes duration, and comorbidities were significantly associated with increased psychological distress. Higher socioeconomic and educational levels correlated with reduced psychological issues, emphasizing the multifactorial nature of diabetes-related psychological burdens.

Conclusion: Routine psychological assessment particularly high-risk individuals T2DM patients is crucial for early detection and intervention improving treatment adherence, diabetes management and overall quality of life.

Keywords: Type 2 Diabetes Mellitus, Psychological health, mental health, Diabetes Distress scale.

INTRODUCTION

Diabetes mellitus, particularly Type II diabetes mellitus (T2DM), has emerged as a major public health concern worldwide due to its rapidly increasing prevalence and associated complications.[1] It's a chronic metabolic disorder characterized by insulin resistance and relative insulin deficiency that manifests as hyperglycemia. According to the International Diabetes Federation (IDF) the global prevalence of diabetes has reached alarming levels, with an estimated 537 million adults affected in 2021 and this number is projected to rise to 783 million by 2045.[2] Several factors contribute to this increase in incidenceof T2DM including increasing life expectancy, sedentary lifestyles, unhealthy dietary habits, obesity, and genetic predispositions. Urbanization and socioeconomic changes have also played significant roles in the rise of T2DM. As the prevalence of T2DM continues to rise understanding the broader

implications of this disease has become increasingly important.[3]

The impact of diabetes extends beyond physical health and is known to significantly affect the psychological well-being of patients. Numerous studies have demonstrated a bidirectional relationship between diabetes and mental health disorders such as depression and anxiety. The chronic nature of diabetes and fear of developing complications can lead to significant emotional distress in patients. Living with diabetes requires constant vigilance regarding diet, physical activity, blood glucose monitoring, and medication adherence. This relentless need for self-care can lead to psychological burdens and affect the overall quality of life. The psychological stress associated with managing a chronic condition like T2DM often exacerbates existing mental health issues or contributes to the development of new ones.[4]

Several risk factors contribute to sense of suboptimal psychological well-being in patients with diabetes. Biological factors, such as neurochemical changes resulting from chronic hyperglycemia can affect brain function and contribute to mood disorders. Additionally, diabetes-related complications, such as neuropathy, retinopathy, and cardiovascular diseases can further diminish patients' psychological health by increasing disability and reducing quality of life. Women with diabetes have been shown to have a higher prevalence of psychological problems as compared to their male counterparts. Furthermore, lower socioeconomic status and limited access to healthcare resources can contribute to poorer mental health outcomes in diabetic patients. Lifestyle factors, such as physical inactivity and poor diet, often coexist with both diabetes and depression, creating a vicious cycle that complicates the management of both conditions.[5]

The psychosocial and mental health issues in patients with T2DM are diverse and complex. Diabetes-related emotional distress characterized by feelings of powerlessness, frustration, and worry about diabetes management and potential complications is frequently observed in patients with T2DM. Cognitive dysfunction, which includes impairments in memory, attention and executive function is another common issue associated with diabetes particularly in older adults. This cognitive decline may result from microvascular complications and chronic hyperglycaemia's impact on brain health. Patients with diabetes may also experience social withdrawal, reduced self-esteem and a decreased sense of well-being, which can further aggravate mental health conditions. The psychosocial burden of diabetes is compounded by societal stigma, which can lead to feelings of shame, blame, and isolation among patients. These factors underline the importance of a comprehensive approach to diabetes management that includes the assessment and support of psychological well-being.[6]

Assessing the psychological well-being of patients with diabetes is crucial for several reasons. First, mental health issues such as depression and anxiety can negatively impact diabetes self-management, leading to poorer glycaemic control and an increased risk of complications. Second, addressing mental health concerns can improve patients' quality of life, adherence to treatment regimens, and overall health outcomes.[7] This study therefore seeks to assess psychological well-being of patients with Type II diabetes Mellitus.

MATERIAL AND METHODS

This was a cross sectional study conducted in the department of psychiatry of a tertiary care medical institute. 80 patients with type II diabetes mellitus were included in this study. Written and informed consent was obtained from all the participants. The sample size was calculated by the formula N = (Z α2) X σ2 / d2 (Zα – Statistical constant (1.96),σ – Expected Standard Deviation and d – Precision/allowable error (corresponding to effect size)) on the basis of pilot studies done on the topic of psychological problem in patients with Diabetes Mellitus assuming 90% power and 95% confidence interval. The sample size required was 70 patients so we included 80 adults with T2DM.

Demographic details, including age and gender, were recorded. For the case group, the duration of diabetes and the specific oral hypoglycaemic drugs being used were noted. The presence of comorbidities, such as hypertension or other systemic illnesses, was also documented. A comprehensive general and systemic examination was conducted for all cases. All patients were evaluated for psychological well-being using the Diabetes Distress Scale (DDS).[8] Patients were asked to rate each item based on how much the issue has distressed or bothered them in the past month. A higher score indicates a greater level of distress related to that particular issue. The impact of diabetes on psychosocial well-being and mental health was analysed. [Table 1]

Statistical analysis was done using SPSS version 22.0 software. Quantitative data was presented as mean and standard deviation. Qualitative data was presented with incidence and percentage tables. For quantitative data, paired t-test was applied and for qualitative data, Chi-square test was used. p value less than 0.05 was taken as statistically significant.

Inclusion Criteria

1. Patients with Type II diabetes mellitus
2. Age more than 18 years.
3. Those who gave informed and written consent to be part of study.

Exclusion Criteria

1. Age less than 18 years.
2. Those who refused consent to be part of study.
3. Patient with pre-existing psychiatric illnesses and cognitive dysfunction.

4. Patients with neurodegenerative disorders, individuals with malignant or autoimmune diseases likely to affect psychosocial and mental well-being.

Table 1: 17 points Diabetes Distress Scale for psychological well-being in T2DM

Sr No	Question	Scale
1	Feeling that diabetes is taking up too much mental and physical energy every day.	1-6
2	Feeling that the doctor doesn't know enough about diabetes care.	1-6
3	Feeling angry, scared, or depressed about living with diabetes.	1-6
4	Feeling that the doctor doesn't provide clear enough directions on managing diabetes.	1-6
5	Feeling that blood sugar testing is not done frequently enough.	1-6
6	Feeling like often failing with diabetes routine.	1-6
7	Feeling unsupported by friends or family in self-care efforts.	1-6
8	Feeling that diabetes controls life.	1-6
9	Feeling that the doctor doesn't take concerns seriously.	1-6
10	Not feeling confident in day-to-day ability to manage diabetes.	1-6
11	Feeling that there will be serious long-term complications, no matter what is done.	1-6
12	Feeling not sticking closely enough to a good meal plan.	1-6
13	Feeling that friends or family don't appreciate the difficulty of living with diabetes.	1-6
14	Feeling overwhelmed by the demands of living with diabetes.	1-6
15	Feeling not having a doctor who can be seen regularly about diabetes.	1-6
16	Not feeling motivated to keep up diabetes self-management.	1-6
17	Feeling that friends or family don't provide desired emotional support.	1-6

Scale
1. Not a Problem
2. A Slight Problem
3. A Moderate Problem
4. Somewhat Serious Problem
5. A Serious Problem
6. A Very Serious Problem

RESULTS

The analysis of gender distribution of the studied cases showed that out of 80 patients there were 52 (65%) males and 28 (35%) females with a M:F ratio of 1:0.52. [Table 2]

Most common age group was between 51-60 years (41.25%) followed by above 60 years (33.75%), 41-50 years (18.75%) and less than 40 years (6.25%). The mean age of the studied cases was found to be 54.57 +/- 12. 32. [Table 3]

The Body Mass Index (BMI) distribution showed that the largest group of patients had been classified as overweight (BMI 25.0-29.9), accounting for 32 cases (40.00%). This was followed by 24 cases (30.00%) in Obesity Class I (BMI 30.0-34.9). A smaller percentage of patients were in Obesity Class II (BMI 35.0-39.0) with 5 cases (6.25%), and Obesity Class III (BMI >40) with 3 cases (3.75%). There were no underweight patients (BMI <18.5), while 16 cases (20.00%) were within the normal BMI range (18.5-24.9). The mean BMI was 28.96 with a standard deviation of ±8.14. [Table 4]

The socioeconomic status distribution showed that the majority of patients were in the middle class, with 32 cases (40.00%). This was followed by 21 cases (26.25%) in the lower middle class and 13 cases (16.25%) in the lower class. A smaller proportion of patients were in the upper middle class, with 12 cases (15.00%), and the fewest were in the upper class, with only 2 cases (2.50%). [Table 5]

The distribution of educational levels among the cases indicated that the highest percentage of patients had completed high school, accounting for 25 cases (31.25%). This was followed by those who were graduates, with 18 cases (22.50%), and those who had attended secondary school comprising 17 cases (21.25%). A smaller proportion had only completed primary school with 12 cases (15.00%). There were 5 postgraduates (6.25%) and the smallest group was illiterate, with 3 cases (3.75%). [Table 6]

39 (48.75%) were having diabetes since less than 5 years. 18 (22.50%) were having diabetes for 6-10 years and in 15 (22%) patients the duration was between 11-15 years. 6 (7.50%) patients were having diabetes since more than 15 years. The mean duration of diabetes mellitus was found to be 7.12 +/- 4.34. The analysis of T2DM patients for presence of other co-morbidities showed that out of 80 patients 14 (17.50%) were having co-existent hypertension, 8 (10%) were having bronchial asthma. [Figure 1]

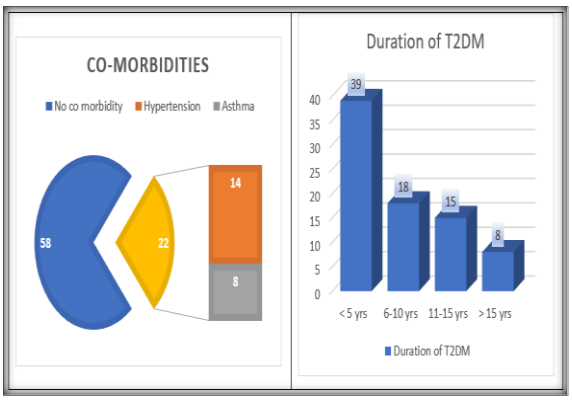

Figure 1: Duration of T2DM and presence of co-morbidities

Finally, patients were analysed for psychological well-being by using the Diabetes Distress Scale (DDS) which is a 17 points scale consisting of Responses having score ranging from 1 to 6 depending upon how the individuals felt about various factors related to diabetes and its management. The patients were divided into having mild (1.1-2), moderate (2-2.9) and severe distress (3 or above) depending upon mean DSS score. There were 18 (22.50%) patients with no diabetes related distress (Mean DSS 1). Mild, moderate and severe diabetes related distress was seen in 22 (27.50%), moderate (28.75%) and 17 (21.25%) patients. Overall mean DSS score was found to be 3.01 +/- 1.72. [Table 7]

The analysis of correlations between various factors and DSS scores in patients with Type II diabetes mellitus (T2DM) revealed several significant associations. Psychological problems were found to be significantly more prevalent in females than in males ($p < 0.0001$). A positive correlation was observed between age ($r = 0.932$), BMI ($r = 0.862$), and the duration of T2DM ($r = 0.864$) with psychological distress, indicating that older age, higher BMI, and longer disease duration were associated with increased psychological issues. In contrast, socioeconomic status ($r = -0.762$) and educational level ($r = -0.724$) were negatively correlated with psychological problems, suggesting that higher socioeconomic and educational levels were linked to fewer psychological issues. Additionally, the presence of comorbidities was associated with significantly higher psychological distress ($p < 0.0001$). [Table 8]

Table 2: Gender Distribution of studied cases

Gender Distribution	No of cases	Percentage
Males	52	65.00%
Females	28	35.00%
Total	80	100.00%

Table 3: Age distribution of studied cases

Age Distribution	Group A	
	Number of cases	Percentage
Less than 40 years	5	6.25%
41-50	15	18.75%
51-60	35	41.25%
Above 60 years	27	33.75%
Total	80	100.00%
Mean Age	54.57 +/- 12. 32	

Table 4: Distribution of body mass index in studied cases

Body Mass Index	Number of cases	Percentage
< 18.5 (Underweight)	0	0.00%
18.5-24.9 (Normal)	16	20.00%
25.0-29.9 (Overweight)	32	40.00%
30.0-34.9 (Obesity Class I)	24	30.00%
35.0-39.0 (Obesity Class II)	5	6.25%
>40 (Obesity III)	3	3.75%
Mean BMI	**28.96 +/- 8.14**	

Table 5: Socioeconomic status of the studied cases

Socioeconomic status	Number of cases	Percentage
Upper	2	2.50%
Upper Middle	12	15.00%
Middle	32	40.00%
Lower Middle	21	26.25%
Lower	13	16.25%
Total	80	82.35

Table 6: Socioeconomic status of the studied cases

Educational level	Number	Percent
Illiterate	3	3.75%
Primary school	12	15.00%
Secondary school	17	21.25%
High school	25	22.50%
Graduate	18	31.25%
Post graduate	5	6.25%
Total	80	100

Table 7: Assessment of psychological well-being of patients by DSS

Mean DSS score	No of cases	Percentage
No Distress (1)	18	22.50%
Mild Distress (1.1-2)	22	27.50%
Moderate Distress (2.1-3)	23	28.75%
Severe Distress (>3)	17	21.25%
Mean DSS score	3.01 +/- 1.72	

Table 8: Correlation of various factors with psychological well being as assessed by DDS

Factor	Pearsons correlation Coefficient/Mean DSS	Interpretation
Gender	Male : 2. 12 +/- 1.32 Female : 3.89 +/- 2.12	P < 0.0001 Highly significant
		Psychological problems were more in females as compared to males.
Age of the patient	0.932	Positive correlation. Increasing age was found to be associated with increasing psychological problems
Body mass index	0.862	Positive correlation. Increasing BMI was found to increasing psychological problems
Socioeconomic status	-0.762	Negative correlation. Better Socioeconomic status was associated with less psychological issues
Educational level	-0.724	Negative correlation.
Duration of T2DM	0.864	Positive correlation. As duration of T2D increases there was increase in psychological issues.
Presence of co-morbidities	With Co-morbidities : 4.16 +/- 2.08 Without Co-morbidities : 1.86 +/- 1.36	P < 0.0001 Highly significant Psychological problems were more in patients with other co-morbidities.

DISCUSSION

Like any other chronic and non-curable disease diabetes mellitus also is associated with a significant burden of psychological issues.[9] It is important to objectively assess presence of psychological problems in these patients.[10] Our study revealed that majority of patients of T2DM had some or the other severity of psychological problems as assessed by Diabetes distress scale. Several factors, including chronic hyperglycemia, diabetes-related complications, lifestyle challenges, and socio-demographic influences are known to contribute to poorer mental health outcomes. Effective diabetes care comprises of not only focussing on glycaemic control but also incorporate routine screening for psychological issues and provide appropriate interventions.[11]

IN this study Patients were assessed for psychological well-being using the Diabetes Distress Scale (DDS), a 17-item scale. The scale measures the extent of distress related to diabetes management, with responses scored from 1 to 6 based on how individuals felt about various diabetes-related factors. There were 18 (22.50%) patients with no diabetes related distress (Mean DSS 1). Mild, moderate and severe diabetes related distress was seen in 22 (27.50%), moderate (28.75%) and 17 (21.25%) patients. Overall mean DSS score was found to be 3.01 +/- 1.72. Gilang Bhaskara et al conducted an analytical cross-sectional study to identify factors associated with diabetes-related distress in Type 2 Diabetes Mellitus patients.[12] For this purpose, the authors undertook a study comprising 124 patients with type 2 diabetes mellitus. The study found that 60.5% of patients had diabetes-related distress, associated with factors such as insulin usage (OR=8.30), recent hypoglycaemia (OR=44.59), retinopathy (OR=10.28), and lack of family support (OR=44.79). On the basis of these findings, the authors concluded that screening for diabetes distress and promoting health education could improve patient outcomes. Similar diabetes associated distress was also reported by the authors such as Sinha R et al,[13] and Sari Y et al.[14]

We found that psychological problems were significantly more prevalent in females than males, highlighting a gender disparity in psychological distress ($p < 0.0001$). Additionally, there was a strong positive correlation between psychological distress and age ($r = 0.932$), BMI ($r = 0.862$), and the duration of T2DM ($r = 0.864$), suggesting that older age, higher BMI, and longer disease duration are linked to increased psychological issues in this population. Conversely, higher socioeconomic status ($r = -0.762$) and educational levels ($r = -0.724$) were associated with lower levels of psychological distress, indicating a protective effect of these factors against psychological problems. Moreover, the presence of comorbidities was significantly associated with higher psychological distress ($p < 0.0001$).

Psychosocial problems and mental health disorders in patients with T2DM has been reported in many studies. Amani Busili et al conducted an umbrella

review to assess risk and protective factors for mental health disorders in patients with type 2 diabetes.[15] For this purpose, the authors conducted a comprehensive search of multiple databases for systematic reviews with and without meta-analyses. The study found that six factors, including obesity, neuropathy, and female sex, had suggestive evidence at Class III level. On the basis of these findings, the authors concluded that targeted interventions are needed for high-risk groups to prevent mental health disorders. Similar mental health issues in cases of T2DM has also been reported by the authors such as Rane K et al,[16] and Gafyels C et al.[17]

Mark Peyrot et al conducted a cross-sectional study to examine psychological well-being and diabetes-related distress across various states of type 2 diabetes.[18] For this purpose, the authors undertook a study comprising 3,432 adults with type 2 diabetes from 13 countries, using structured interviews to collect data. The study found that psychological well-being and diabetes-related distress significantly worsened with increased complications and intensified medication regimens. On the basis of these findings, the authors concluded that the progression of diabetes and its management impact psychological adjustment, requiring targeted psychological support. Similar findings were also reported by Massey CN et al,[19] and Maor M et al.[20]

The findings of the above studies as well as this study found that the factors such as female gender, increasing age, body mass index, poor socio-economic status, low education status, increasing duration of diabetes and presence of co-morbidities correlated positively with increased incidence of psychosocial problems.

CONCLUSION

There is a significantly high prevalence of psychological distress among patients with Type 2 Diabetes Mellitus (T2DM), particularly those with high-risk factors such as female gender, older age, higher BMI, longer disease duration, low socioeconomic status, low educational levels and presence of comorbidities. These findings suggest that routine assessment of psychological well-being should be carried out in patients with T2DM especially in high-risk individuals. Early detection and intervention can improve treatment adherence, diabetes control, and overall patient quality of life.

Conflict of interest: None.

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