Section: Psychiatry

Original Research Article

DEPRESSION AND QUALITY OF LIFE AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS, A CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE IN NORTHERN KERALA

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Abstract

Background: Diabetes patients have been reported to experience depression frequently. Depression has been found to have increased impact on diabetes mellitus outcomes. This study was conducted to determine the prevalence of depression and the variables related with depression among individuals with Type 2 diabetes mellitus in a tertiary care centre in northern Kerala. **Materials and Methods:** This study was conducted at the Medicine and the Psychiatry department of Malabar medical college, Kozhikode between June 2022 to July 2022. All consenting patients with a diagnosis of T2DM underwent interviews with screening depression using PHQ-9 Questionnaire and diagnosis confirmed by The Psychiatrist using DSM 5 criteria along with WHOQOL-BREF self-assessment questionnaire. **Results:** Out of 275 diabetic patients evaluated during the study period, 144 (52.4 %) were males. The mean age of the study population was 57.7 ± 10.3 years. The mean duration of T2DM was found to be 14.1 ± 5.45 years. Among the participants 86 (31.3 %) patients had moderate depression, 42 (15.3 %) had severe depression and the remaining 147 (53.5 %) had no clinical depression. Older age (> 65 years (21.4 %; p value <0.05), female gender (47.6 %; p value <0.05), low socioeconomic status (22.9 %; p value <0.05), retired patients (14.9 %; p value <0.05) and having complications from T2DM (61.4 %) or from comorbidities like hypertension (51.6 %) and coronary artery disease (42.5 %) and were found to be significantly associated with depression as risk factors. The mean and standard deviation of quality of life in diabetic patients with and without depression was 55.8 ± 14.1 and 69.5 ± 15.3, respectively that was significant in two groups (P < 0.0001). **Conclusion:** This study found a high proportion of patients with diabetes having moderate to severe depression which require screening as well as treatment for depression in order to achieve a better outcome of diabetes mellitus and quality of life.

INTRODUCTION

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Diabetes is a chronic medical disorder. The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the healthcare system. According to the World Health Organization, it is estimated that 300 million people will suffer from diabetes by 2025. DM is classified on the basis of the pathogenic process leading to hyperglycemia. Type 1 DM develops as a result of autoimmunity against the insulin-producing beta cells, resulting in insulin deficiency. Type 2 DM is a heterogeneous group of disorders characterised by variable degrees of insulin resistance, impaired insulin secretion, and increased hepatic glucose production. The worldwide prevalence of DM has risen dramatically over the past two decades. The prevalence of type 2 diabetes is increasing much faster, owing to dietary changes, rising obesity, and decreased activity levels. Depression is common among patients with type 2 diabetes mellitus (T2DM) and it is associated with poor outcomes. Depression is still largely unrecognised by physicians managing patients with diabetes mellitus (DM).[11] It is estimated that only one-third of people with both DM and major depression are recognised and appropriately treated for both disorders.[12] Individuals living with DM

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become more prone to health complications, have an overall reduced quality of life, and result in higher burden on the economy due to their medical care expenditure. Patients with diabetes are almost twice as likely to suffer from anxiety and depression as the general population.[1,2] In people with type 2 DM, greater incidence of depression was seen in insulin-dependent individuals than those who were non-insulin dependent.[3] Among all diabetic complications, neuropathy and nephropathy have been seen to be the strongest predictors of depression.[4] Both diabetes and anxiety/depression are associated with premature morbidity and mortality, and when these conditions co-exist, the risk of developing co-morbidities, complications, patient suffering, and associated cost escalates.[5] Depression was slightly higher in female patients and people aged >50 years. A greater prevalence of depressive episodes was found in people with a longer duration of diabetes and uncontrolled diabetes.[6] The prevalence of depression in T2DM patients in India is limited. Therefore, recognition of depression becomes important as cost-effective treatment is available, resulting in improvement of diabetic care as well.[7,8] Having diabetes. and depression may also be associated with higher risk of suicide, with some reports of a 10-fold increased risk of suicide and suicidal ideation.[9,10] Compared with patients with diabetes alone, patients with depression and diabetes have shown poor diligence in maintaining dietary restrictions and exercise, poorer self -management and poor medication adherence.[13,14] Combination of depression and DM reduces overall quality of life, impairs self-management of diabetes, increases the risk of diabetic complications, and reduces overall life expectancy.[15] With this background, we investigated the proportion of depression and its determinants among patients with T2DM attending tertiary care hospitals in northern Kerala.

Aim and Objective

- To assess Depression among patients with Type 2 Diabetes
- To determine the Quality of life among patients with Type 2 Diabetes.

MATERIALS AND METHODS

Study Setting & Population

This study was conducted at the medicine and psychiatry Department of Tertiary care Hospital in Kozhikode with 720 beds. Patient catchment area of this hospital includes Kozhikode and neighbouring districts. Patients are referred to medicine and psychiatry Department from peripheral centres, hospitals and from other departments of this College. Patients do come directly as well. This study was initiated after obtaining an institutional ethical committee approval.

Patients in the medicine and psychiatry department who fulfill inclusion and exclusion criteria are recruited for this study. 275consecutive patients suffering from diabetes diagnosed on the basis of American Diabetic association criteria, attending medicine and psychiatry OPDs and inpatient admissions.

Diabetes diagnosed as per the American diabetic association guidelines which includes

FPG >126 mg/dL (7.0 mmol/L). Fasting is defined as no caloric intake for at least 8 h.

OR

2-h PG >200 mg/dL (11.1 mmol/L) during OGTT.

OR

HbA1C >6.5% (48 mmol/mol).

OR

In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random

plasma glucose >200 mg/dL (11.1 mmol/L).

Inclusion Criteria

1. Patients of the age group 30 years and above
2. Both male and female patients
3. Diagnosed cases of Type 2 DM

Exclusion Criteria

1. Mentally retarded and others who cannot consent with the study
2. Those patients with seizure disorder, cerebrovascular accidents,
3. Patients who have previous psychiatric history.
4. Pregnant and Lactating woman

Instrument and Tools

1. A Specialized proforma is prepared to collect socio demographic details, diabetes data and psychiatric History.
2. PHQ-9-The 9-question Patient Health Questionnaire (PHQ-9) is a diagnostic tool introduced in 2001 to screen adult patients in a primary care setting for the presence and severity of depression.

It rates depression based on the self-administered Patient Health Questionnaire (PHQ).it is a 9-item questionnaire and The total sum of the responses suggests varying levels of depression.

Scores range from 0 to 27. In general, a total of 10 or above is suggestive of the presence of depression. Diagnosis of Major Depressive Disorder can be made by using responses to PHQ-9 questions and diagnosis is confirmed by consultant psychiatrist by using criteria from DSM Vth edition.

According to DSM-5, Major Depressive Disorder is likely if 5 or more of the 9 symptoms are present for “most of the day, nearly every day" in the past 2 weeks and one of the symptoms is depressed mood or little interest or pleasure in doing things (questions 1 and 2 on the PHQ-9).

The symptoms must also cause significant distress and loss of function, and the symptoms must not be better explained by substance use or another medical or psychiatric condition.

3. WHOQOL-BREF-The WHOQOL-BREF is a shorter version of the WHOQOL-100. The WHOQOL-BREF is a self-administered questionnaire comprising 26 questions on the individual's perceptions of their health and well-

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being over the previous two weeks. There are also two separate questions which ask specifically about 1) the individual's overall perception of their health and 2) the individual's overall perception of their quality of life. Each individual item of the WHOQOL-BREF is scored from 1 to 5 on a response scale, which is stipulated as a five-point ordinal scale. The scores are then transformed linearly to a 0–100-scale.

Sampling Procedure

Convenient patients attending in the medicine and psychiatry OPDs and inpatient wards of Malabar Medical College, Kozhikode

Methods of Data Collection

This study was done from june to august 2022. The diabetes patients satisfying inclusion and exclusion criteria are included in the study. Informed consent was obtained from them as well as from relatives. Each patient examined in detail and data were recorded in a specifically designed proforma sheet. This include Socio-Demographic, Diabetic and Psychiatric data. Sample consisted of 275 consecutive patients attending medicine and psychiatry OPDs &admitted as in patients suffering from diabetes mellitus as diagnosed by American diabetic association guidelines. Cases were selected diagnosed with minimum 3 months duration & who gave consent for the study. Depression was screened by PHQ-9 and quality of life assessed by WHO brief questionnaire and diagnosis is confirmed by consultant psychiatrist using criteria from DSM vth edition.

Statistical Analysis

Statistical Package for Social Sciences 20.0 for Windows was used for analyzing the data. Qualitative variables were expressed as frequency and percentages, and quantitative variables as mean and standard deviation. Mann Whitney U test was used to examine group differences across gender for continuous variables, and chi-square test was used for categorical variables. P values less than 0.05 were considered significant.

RESULTS

The socio demographic profile of the study participants is as mentioned in Table 1.

Out of 275 type 2 DM patients 53.4 % of the patients are in-patients. The mean age of the study population was 57.7 years with majority of the participants within the 40-65 years age group (48.4 %). Of the study participant's males (52.4%) were slightly more than females (47.6%). Overall majority of the patients were married (80.4%) and belonging to the middle socio-economic status (63.6 %) and occupationally skilled (33.8%).

Screening for depression was done using PHQ-9 scales and 128 (46.5 %) patients had depression (31.3 % having moderate depression and 15.3 % having severe depression). Out of 128 patients who had depression 74.2% i.e 95 patients were unaware of their depression and 33 patients who were aware of their depressive status 12 (36.3 %) had consulted the doctor. The average duration of T2DM overall was found to be 14.1 ± 5.45 years.

The commonest comorbidity seen with T2DM was hypertension (51.6%) followed by coronary artery disease seen in 42.5% of the patients included in the study.

Depression was found to significantly associated with patients aged more than 65 years (21.45 %) (P value =0.023) and females (47.6 %) being significantly (P value =0.033) associated with depression as compared to males. Patients who belonged to the lower socio-economic status (22.9 %) had significantly (p value =0.004) and those patients who retired (14.9 %) higher association with depression (p value=0.0434) as mentioned in the Table 2.

Out of 275 included patients 169 had complications apart from diabetes as elaborated in table 3 and hypertension and CAD being the most common complications seen. It was found that majority of the depressed patients had higher complication, wherein neuropathy, Hypertension and CAD being significantly associated with depression (p value < 0.05). The patients receiving treatments 45% of the depressed patients received oral drugs and 53.7% received insulin. Table 3

The quality of life was assed using WHO-BREF scoring and it was significantly lower in diabetic depressed patients as mentioned in table 4.

Table:1 Demographic characteristics

	N	%
N	275	
Mean Age	57.7 ± 10.3 years	
< 40	102	37.1
40-65	133	48.4
>65	40	14.5
Gender		
Male	144	52.4
Female	131	47.6
Marital Status		
Married	221	80.4
Un Married	54	19.6

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Socio Economic status		
Upper	37	13.5
Middle	175	63.6
Low	63	22.9
Occupational status		
Professional	30	10.9
Semi-professional	34	12.4
Skilled	93	33.8
Un-Skilled	43	15.6
Housewives	44	16.0
Retired	31	11.3
Depression		
Moderate Depression	86	31.3
Severe Depression	42	15.3
No depression	147	53.5

DISCUSSION

According to the International Diabetes Federation "diabetes is one of the largest global health emergencies of the 21st century". Patients with diabetes mellitus have been found to have an elevated incidence of depressive disorders, which are frequently comorbid with anxiety, despite the fact that the prevalence of mental illnesses in these patients is generally thought to be comparable to that of the general population. Numerous factors, like psychological and psychosocial factors, genetic susceptibility and pathophysiological abnormalities thought to contribute to the co-occurrence of depression and diabetes16 in the present study the 46.5% of diabetic patients had depression and this was comparable to the study by Joseph et al,[17] done on similar lines, however various other studies showed a lower proportion of patients around 30%. Amongst the patients with depression, our study showed a much a lower proportion of patients as compared to previous studies mentioned above (18-20).

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The present study also evaluated for the association of depression based on gender and it was found that females suffered with depression more as compared to males which is consistent with the fact that females have twice the propensity of depression as compared to males.[21] Hormonal factors like estrogen as well as various other factors like dependence of males and passivity can be attributed to significant depression amongst females.[22,23]

In our study various risk factors have ben evaluated and were found to be associated with depression. Patient with age more than 65 years were found to be significantly associated with depression in our study and most of them were retired which also showed significant association with depression. Old people in India are depended on family for their survival in middle and low socio-economic status which has been elucidated in our study with majority of depressed patients in low socio-economic status. Studies by Lyod et al. and Larijani et al. done on the prevalence of depression in diabetic patients have not shown any association with age.[24,25]

Marital status of the patients was also evaluated and did not show any significant association with depression. In a study conducted in Bangladesh, it was discovered that housewives had severe depression the worst, whereas retired people experienced mild to moderate depression. According to this study, businessmen had the lowest rates of general depression while housewives had the highest rates.[26]

In our study the mean duration of T2DM was found to be 14.1 years and was significantly higher in depressed population. T2DM is associated with various comorbidities and complications associated with, in our study around 61% of the study population had complications apart from T2DM. Hypertension followed by CAD were the key complications seen in the majority of the patients, evaluated for the study which showed significantly higher association with depression as well. Other comorbidities like neuropathy, microvascular and macro vascular complication were also evaluated but only neuropathy showed a significantly higher association with depression. Studies by Joseph et al. and Jose et al. showed a significant association of depression in patients with comorbidities like hypertension and CAD.[17] Considering the various other complications associated with T2DM like neuropathy, micro and macrovascular complications a study by Dhanraj et al. conducted in Chandigarh

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also showed a significant association depression in patients with diabetes28.Therefore, our results have been in accordance with these previous studies.

In our study it was seen that patients on insulin had significantly higher association with depression as compared to patients receiving oral therapy. According to research conducted in various parts of the world, people who take insulin are significantly more likely to have severe depression than people who use oral anti-diabetic medications.[29,30] As the duration of T2DM has been seen to be 14 years in our study which is long, the pain associated with insulin injection may be one of the reasons for depression as discussed in the Dhanraj et al. study which found an association of depression with insulin usage. The quality of life was also evaluated using the WHO BREF scoring system and it provides robust evidence that in depressed patients the quality of life is significantly reduced.

Limitation and Future Directives

This study was conducted in a tertiary hospital and therefore cannot generalised to the whole population. The causality assessment was not conducted between diabetes and depression in our study.

Table 2: Association with Depression

	Depressed N (%)		**Not depressed N (%)**		**Total**		**P value@**
N	128	46.5	147	53.5	275	128	
Age Group							
< 40	40	43.5	52	56.5	92	33.45	0.023
40-65	56	45.2	71	57.3	124	45.09	
>65	32	54.2	24	40.7	59	21.45	
Gender							
Male	55	38.2	89	61.8	144	52.4	0.005
Female	73	55.7	58	44.3	131	47.6	
Marital Status							
Married	89	48.6	94	51.4	183	66.5	0.056
Un Married	39	42.3	53	57.6	92	33.5	
Socio Economic status							
Upper	25	43.9	32	56.1	57	20.7	0.004
Middle	64	41.3	91	58.7	155	56.4	
Low	39	61.9	24	38.1	63	22.9	
Occupational status							
Professional	14	46.7	16	53.3	30	10.9	0.0434
Semi-professional	15	44.1	19	55.9	34	12.4	
Skilled	30	36.1	53	63.9	83	30.2	
Un-Skilled	22	51.2	21	48.8	43	15.6	
Housewives	20	45.5	24	54.5	44	16.0	
Retired	27	65.9	14	34.1	41	14.9	

@ Chi-Square, Mann-Whitney test, * P value<0.05

Table 3: Association of complications and comorbidities with depression

	Depressed N (%)		Not depressed N (%)		Total		P value@
Duration of T2DM (years)	15.2 ± 5.45		13.1 ± 7.45		14.1 ± 5.45		0.023
Complications Present	91	53.85	78	46.15	169	61.45	0.0001
Complications Absent	37	34.91	69	65.09	106	38.55	
Complications	Depressed		Not depressed		Total		
	N	%	N	%	N	%	
Neuropathy*	53	55.2	43	44.8	96	34.9	0.004
Nephropathy	42	50.0	42	50.0	84	30.5	0.340
Hypertension*	75	52.8	68	47.9	142	51.6	0.005
CAD*	62	53.0	55	47.0	117	42.5	0.007
MIcrovascular	43	44.8	53	55.2	96	34.9	0.552
Macrovascular	46	45.5	65	64.4	101	36.7	0.087
Type of drugs	N	%	N	%	N	%	P value
Oral Drugs	68	44.9	99	55.1	167	60.7	0.016
Insulin	60	53.7	48	29.9	108	39.3	

@ Chi-Square, Mann-Whitney test, * P value<0.05

Table 4: Quality of Life

	Depressed N (%)	Not depressed N (%)	P value@
WHO BREF QOL	55.8 ± 14.1	69.5 ± 15.3	0.0001

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@Mann-Whitney Test

CONCLUSION

This study found a high proportion of female patients associated with depression. Depression was commonly seen in retired and old patients and those who were associated with complications like hypertension and comorbidities ultimately affecting their quality of life. Therefore, patients with long standing diabetes require screening as well as treatment for depression in order to achieve a better quality of life.

Conflict of Interest-None

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