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Research Article

A Study on The Interrelation of Anxiety and Depression with Diabetes Mellitus

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ABSTRACT
The present study aimed to determine the association between anxiety and depression in patients with type 2 diabetes mellitus. All patients with diabetes (182 patients) whose data were recorded in Narasaraopeta and Palanadu district hospitals. Data such as socio-demographic information and depression and anxiety assessment tools. The age range of 40-50 years was found to be more at 36.81%, 56.59% women and 55.49% married, 38.45% had a degree, 47.25% are unemployed, 64.84% are from the city, and 52.20% and 67.58% are non-drinkers and non-smokers; 69.23% have no history of diabetes and 81.87% have no history of the disease, 65.93% were found to be type 2 diabetics, Among 43.41% with diabetes ≥ 10 years, 41.76% were under insulin oral hypoglycemic agents, 43.41% have 200-300 mg/dL, 53.30% have 5-10% hbA1c; approximately 40.11% for depression and 34.07% for anxiety. Most hospitalized patients with diabetes developed moderate/severe anxiety or depression, or both, during hospitalization. Screening for anxiety and depression in high-risk diabetics is therefore recommended with proper supervision.

Keywords: depression, unemployed, diabetics.

INTRODUCTION

Patients with chronic medical conditions suffer from psychological disorders such as anxiety and depressive feelings that slow down their recovery and healing process. Therefore, patients with chronic medical conditions such as cardiovascular problems, diabetes mellitus (DM), lung disease, and cancer suffer from psychological disorders while trying to manage their physical illnesses (Sareen J., 2005). It is known that many persons with chronic diseases also have undiagnosed comorbidities, including depression, anxiety and stress (DASS) (Ivbijaro GO., 2011). People with diabetes mellitus may have co-occurring psychological symptoms and have been shown to have poor disease outcomes. Mental illness, or mental health disorder, refers to a wide range of mental health conditions that affect mood, thinking, and behavior. Depressed and anxious individuals are less likely to adhere to the additional burden of diabetes self-care recommendations and are less physically active, less likely to adhere to their dietary regimen, and less likely to take prescribed medications (Ciechanowski PS., 2007).

In addition, global estimates of the prevalence of depression and anxiety in patients with diabetes appear to vary between countries. Although data from developing countries are scarce, studies from Asia report depression prevalence rates from 17% to 44% and anxiety prevalence rates from 4% to 58% (Balhara YP., 2011). Different settings (primary versus secondary and tertiary health centers) and sociodemographic characteristics of the participants could explain differences in the prevalence of depression. In diabetics, a meta-analysis found a relationship between mental illness and hyperglycemia (type 1 and type 2). In addition, a systematic review and meta-analysis report that individuals with type 2 diabetes have a slightly higher chance of depression (Zanoveli JM., 2016).

Adverse socioeconomic circumstances in early life increase the risk of diabetes mellitus and cognitive disorders in late life (Ahmad A., 2018). DM often appears as a comorbidity of multiple psychiatric diseases, which complicates its outcome. People with diabetes are 1.5 times more likely to develop DASS, especially anxiety, and depression, regardless of age, ethnicity, or socioeconomic status. Although psychological and psychiatric problems are often present in people with DM, in most cases they are neither diagnosed nor treated, to the detriment of the patient (Salinero-Fort MA., 2018).

The study designed to evaluate possible risk factors that may contribute to the development of depression and anxiety in diabetic patients are personal and family history, stressful life events, domestic violence, physical illness, and clinical factors.

MATERIALS AND METHOD

A cross-sectional study was conducted from November 2022 to April 2023. This study was conducted in different hospitals of Narasaraopeta and Palanadu districts using patient profile forms and other DASS-related data was collected from patients.

Inclusion criteria were patients with type 1 or 2 diabetes, patients with mood swings diagnosed with diabetes, and ages over 18 years. Exclusion criteria were a previous clinical diagnosis of anxiety, depression, and other psychiatric disorders. Patients with gestational diabetes were also excluded from the study.

Patient sociodemographic data including age, sex, marital status, education level, and occupation were recorded. Factors that may have influenced the severity of DM such as smoking, family history of DM, duration of DM, therapy, HbA1c levels, and blood sugar levels were also recorded.

Statistical analysis:

All data obtained were consolidated and entered into SPSS 20 statistical software. Data were expressed as frequencies (%) for categorical variables. Pearson's correlation test was used to measure differences between variables.

RESULTS

Table 1: Sociodemographic characteristics of the selected study population

Variable	Category	Frequency (182)	Percentage (%)
Age (yrs)	18-30	13	7.14
	30-40	37	20.33
	40-50	67	**36.81**
	50-60	52	28.57
	≥61	13	7.14
Sex	Male	79	43.41
	Female	103	**56.59**
Marital Status	Married	101	**55.49**
	Unmarried	39	21.43
	Divorced	09	4.95
	Single	33	18.13
Educational levels	Uneducated	57	31.32
	Primary	62	34.07
	Degree	70	**38.46**
Occupation	Unemployed	86	**47.25**
	Employed	81	44.51
	Retired	15	8.24
Residence	Rural	64	35.16
	Urban	118	**64.84**
Alcohol Consumption	Yes	87	47.80
	No	95	**52.20**
Smoking	Yes	59	32.42
	No	123	**67.58**

Table 2: Clinical characteristics of the selected population

Variable	Category	Frequency (182)	Percentage (%)
Family history Diabetes	Yes	56	30.77
	No	126	69.23
Family history of mental illness	Yes	33	18.13
	No	149	81.87
Type of diabetes	Type 1	62	34.07
	Type 2	120	65.93
Duration of diabetes	≤5 yrs	43	23.63
	5-10 yrs	60	32.97
	≥10 yrs	79	43.41
Treatment	Insulin	39	21.43
	OHG	67	36.81
	Insulin+OHG	76	41.76
Blood glucose levels	≤150	25	13.74

(mg/dL)	151 -200	46	25.27
	200-250	79	43.41
	250-300	32	17.58
HbA1c (%)	≤5	12	6.59
	5-10	97	53.30
	≥10	73	40.11

Table 3: Prevalence of mood swings in the study population

Variable	No mood swings	Depression	Anxiety
No (%)	47 (25.82)	73 (**40.11**)	62 (34.07)
Normal	NA	18 (24.66)	12 (19.35)
Mild	NA	26 (35.62)	17 (27.42)
Moderate	NA	12 (16.44)	23 (37.10)
Severe	NA	11(15.07)	8 (12.90)
Extremely Severe	NA	6 (8.22)	2 (3.23)

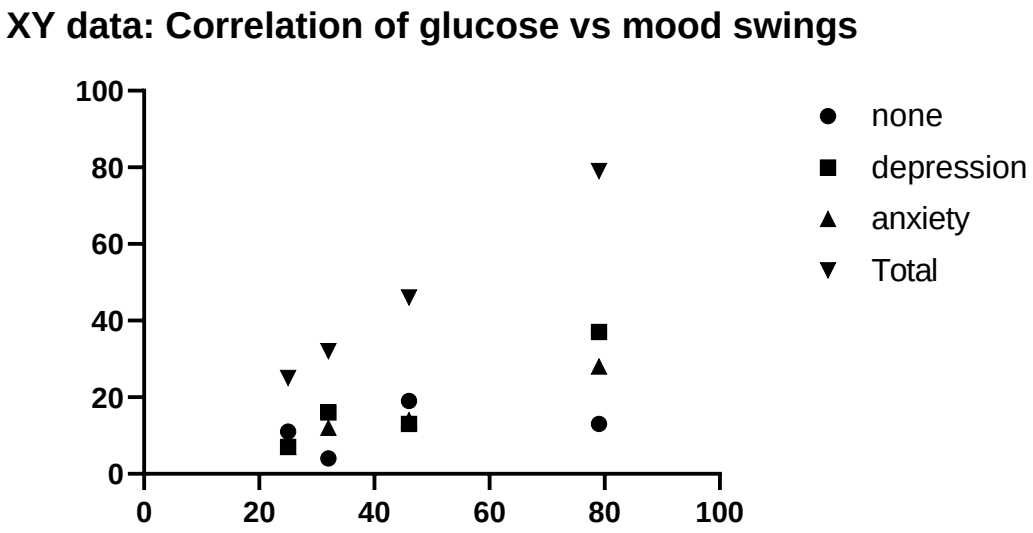

Figure 1: Correlation of glucose vs mood swings

Table 4: Correlation of glucose vs mood swings using Pearson r correlation

Correlation of glucose vs mood swings	Total vs. none	Total vs. depression	Total vs. anxiety
Pearson r	0.3720	0.9445	0.9882
95% confidence interval	-0.9169 to 0.9820	-0.1802 to 0.9989	0.5410 to 0.9998
R squared	0.1384	0.8920	0.9766
P (two-tailed)	0.6280	0.0555	0.0118
P value summary	ns	ns	*
Significant? (alpha = 0.05)	No	No	Yes
Number of XY Pairs	4	4	4

DISCUSSION

In examining the relationship between different static glucose levels on mood, experimental research in healthy volunteers has so far shown no consistent effect, while some studies in people with diabetes suggest that both hyperglycemia and hypoglycemia can induce negative mood states, including anxiety, sadness, and agitation

(Muijs LT., 2020). The age range of 40-50 years was found to be more, namely 36.81%, in the selected population n=182, 56.59% are women and 55.49% are married people, as shown in Table 1.

The pooled prevalence of comorbid depression among population-based T2DM patients in China was found to be higher in women, participants aged ≥60 years, those with primary school education or less, and individuals living alone (Liu X., 2022). These results agree with previous studies (Freedland KE., 2003) that women had higher depression scores than men. Depression and anxiety were also found to be significantly associated with patient age and lower educational attainment. This was consistent with the findings of a Mexican-American study that found depressed diabetics to be older and less educated (Kendzor DE., 2014).

Other demographic parameters revealed that 38.45% were in education level, 47.25% are unemployed, 64.84% are from urban and 52.20% and 67.58% are non-drinkers, and 67.58% are non-smokers as shown by Table 1. The significant role of smoking and drinking in the prevalence of diabetes in the selected population.

Regarding family history of mental illness, participants with a family history of mental illness were 1.71 times more likely to be depressed and 1.74 times more likely to have anxiety compared to those without a family history of mental illness.

A family history of diabetes and mental illness is assessed to determine the association between diabetes and mood changes. In this study, 69.23% have no history of diabetes and 81.87% have no history of the disease as shown in Table 2. A possible reason may be a family history of mental disorders, one of the risk factors for mental disorders (genetic effect). especially mood disorders, meaning that if one parent has a mood disorder, the child will have between 10 and 25 percent risk of having a mood disorder (Sadock BJ., 2007).

Among 65.93% who were found to be type 2 diabetics in people with type 2 DM, a greater incidence of depression was observed in insulin-dependent individuals than in non-insulin-dependent individuals (Li C., 2008). Among the 43.41% who had diabetes for ≥10 years, 41.76% were under insulin with oral hypoglycemic agents as shown in Table 2. Blood sugar levels and glycosylated hemoglobin levels were measured to assess glycemic control. Among the 182 population, 53.30% are having 5-10% hbA1cThe combination of depression and DM reduces the overall quality of life, worsens self-management of diabetes, increases the risk of diabetic complications, and reduces overall life expectancy. Diabetic patients with co-existing depression reported higher HbA1c and greater blood sugar disturbance (Bajaj S., 2012). This study found that elevated HBA1c was an independent risk factor for DASS. Several studies, including ours, have shown a positive association between HbA1c levels and DASS status. In a study in the Netherlands, several individual depressive symptoms were associated with higher HbA1c levels in outpatients with DM, and these associations persisted over time (Bot M., 2013).

Depression in diabetics is associated with poor glycemic control, which is one of the causes of diabetic complications. This not only greatly burdens the healthcare system, but also directly affects the quality of life of patients (Parihar HS., 2016). Previous studies have shown that individuals who are insulin resistant may have higher serotonin concentrations and may be more prone to depression and even suicide. In addition, women with diabetes may suffer from depression more often. This study showed that the prevalence reached approximately 40.11% for depression and 34.07% for anxiety as shown in Figure 1. Das-Munshi et al. reported in a cross-sectional study that the prevalence of major depression in diabetic patients was approximately 12%, while milder types of depression were reported as 15-35%, other studies found higher rates of depression in diabetic patients (Mukrim ME., 2019).

CONCLUSION

The incidence of depression and anxiety in hospitalized patients with diabetes mellitus is high. Strong predictors of depression in patients with diabetes include female gender, longer duration of diabetes, and non-insulin therapy. The coexistence of these two chronic disabling diseases worsens the overall quality of life. In patients with type 2 DM, it is very important to diagnose and manage anxiety and depression, which is only possible with the cooperation of diabetologists, general practitioners, and psychiatrists.

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