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PREVALENCE OF DEPRESSION AMONG TYPE 2 DIABETES MELLITUS PATIENT

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ABSTRACT

The study aimed to identify Prevalence of Depression Among Type 2 Diabetes Mellitus Patient. The researcher the descriptive survey approach, where the scale was prepared electronically through Google Forms, and the study sample's approvals were obtained to participate in the study by filling out forms specific to scientific research ethics. It was clarified that the study is used for scientific research purposes and that the information is treated with complete confidentiality. At the end of the test, each patient's final score was calculated to determine if they suffer from depression and the severity of their depression, and a comprehensive interview was conducted with each patient. The study included (390) patient (200) men and (190) women. The ages of the participants ranged from 18 to 80 years. Patients were randomly selected during their visit to the Northern crossing primary medical center in Jordan. The two-way relationship between depression and diabetes has been widely documented. Depression can precede diabetes, or diabetes can promote the onset of an associated depressive condition. The complications of diabetes itself are a risk factor for the onset of depressive conditions. Patients with diabetes who experience associated depression have poorer glycemic control, a greater number and severity of complications, a poorer quality of life.

KEYWORD: Prevalence of Depression, Type 2 Diabetes Mellitus, Patient.

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is characterized by dysregulation of carbohydrate, lipid, and protein metabolism and results from impaired insulin secretion, insulin resistance, or a combination of both. Of the three main types of diabetes, type 2 diabetes is much more common (accounting for more than 90% of all cases) than type 1 diabetes (type 1 diabetes) or gestational diabetes. Over the past decades (Kant, et al, 2021), our understanding of the development and progression of type 2 diabetes mellitus has evolved rapidly. Its main cause is the progressive secretion of insulin by pancreatic beta cells, usually against the background of pre-existing insulin resistance in skeletal muscle, liver and adipose tissue1. Marked hyperglycemia is preceded by prediabetes, a high-risk condition that predisposes individuals to the development of type 2 diabetes mellitus (Hussain, et al, 2018).

Prediabetes is characterized by one of the following: elevated blood glucose (IFG), glucose tolerance (IGT), or elevated levels of glycated hemoglobin A1c (HbA1c). Individuals with IFG levels are characterized by having a higher than normal fasting plasma glucose level, but do not meet the diagnostic criteria for diabetes. IGT is characterized by muscle insulin resistance and delayed insulin secretion (second phase) after a meal, while people with lower levels of IFG (Salinero-Fort, et al, 2018).

Hepatic insulin resistance and dysfunction of the initial secretion of insulin2 (first phase) are manifested. People with prediabetes have HbA1c levels between 5.7 and 6. 4%; they represent a heterogeneous group in terms of pathophysiology and are clinically very diverse. Annual conversion rates from prediabetes to type 2 diabetes mellitus range from 3% to 11% per year3 (Huang, et al, 2018).

The clinical presentation, the underlying pathophysiology, and the progression of the disease in patients with diabetes can vary greatly between individuals, and sometimes the atypical presentation of symptoms can make it difficult to accurately classify Type 2 diabetes mellitus are asymptomatic (Omar, et al, 2021), while others have severe hyperglycemia or even diabetic ketoacidosis. Latent autoimmune diabetes in adults4 and Type 2 diabetes mellitus in young people5 canpasses through Type 2 diabetes mellitus (DeFronzo, et al, 2015). In asymptomatic people, the timing and

frequency of testing for prediabetes or type 2 diabetes are based on the presence or absence of risk factors (AL-Khaqani & Al-Turaihi, 2024).

The prevalence of diabetes mellitus in adults, of which type 2 diabetes mellitus has become predominant, is projected to increase over the next two decades, and most of this increase will occur in developing countries, where most patients are 45 to 64 years old (Eskandari, et al, 2024). The latter is expected to be equal to or even higher than the former in developing countries, resulting in a double burden resulting from the current trend of transition from communicable diseases to non-communicable diseases (Hussain, et al, 2018).

Screening people at risk is important because prediabetes is common and about 30% of people with type 2 diabetes are not diagnosed. The prevention of diabetes requires the identification of people with prediabetes and intervention with lifestyle modifications (weight loss and physical exercise) as well as antidiabetic and antiobesity medications (Haji-Arabi, et al, 2024). The Consensus Conference of the American Diabetes Association (ADA)10 recommended that people at high risk (HbA1c> 6.5%; BMI ≥ 30 kg per m2; age ≤ 60 years) with IGT or IFG levels are treated with metformin. Pioglitazone and low-dose metformin and rosiglitazone combined (Khawagi, et al, 2024).

Type 2 diabetes (T2D) has become a major public health problem worldwide (Chireh, et al, 2024). 80% of those affected live in low and middle income countries (Mushtaque, et al, 2016). This number of patients is expected to reach 592 million by 2035 (Weiss, et al, 2024). In this country, the prevalence of Type 2 diabetes mellitus (T2D) has increased dramatically despite the relatively low prevalence of obesity (DeFronzo, et al, 2015). At the same body mass index (BMI), Asians tend to have a higher percentage of body fat, more abdominal obesity, and less muscle masscs, which may explain their increased predisposition to type 2 diabetes. In addition, poor nutrition in utero and early life, combined with overnutrition later, may contribute to the accelerated trajectory of the type 2 diabetes epidemic, particularly in populations experiencing rapid dietary changes, including modified diet and reduced sport. The prevalence of type 2 diabetes mellitus is slightly higher in men than in women (Omar, et al, 2021).

Type 2 Diabetes mellitus is a metabolic disease that can be prevented by lifestyle changes, diet control and control of overweight and obesity. Public education remains essential to controlling this developing epidemic. New medications have been developed, but there is no cure in sight for this disease, despite new insights into the pathophysiology of the disease. Management should be adapted to improve the quality of life of people with Type 2 diabetes mellitus (Olokoba, et al, 2012).

Depression as a comorbidity in patients with type 2 diabetes mellitus (T2DM) is associated with significant morbidity and mortality and an increase in the economic burden of health. The Indian healthcare system is greatly affected by type 2 diabetes mellitus and it is important to understand the prevalence of depression associated with type 2 diabetes mellitus (Randväli, et al, 2024).

Depression is defined as "a common mental disorder characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-esteem, problems with sleep or 'appetite, feelings of tiredness and lack of concentration (Weiss, et al, 2024). Depression is responsible for diabetes self-care activities, poor sleep quality, poor health quality, poor medication adherence, poorer glycemic control and increase in diabetic complications (AL-Khaqani & Al-Turaihi, 2024).

Depression as a comorbidity in people with diabetes is also responsible for increased disability, morbidity, mortality and a significant health economic burden for the health of patients and the health of the system (Bąk, et al, 2020). Early diagnosis and treatment of depression in people with diabetes improves quality of life, can prevent or delay complications, and has a beneficial effect on glycemic control (Mushtaque, et al, 2016). Studies have shown that depression is a significant burden in people with type 2 diabetes mellitus (Das, et al, 2013). To improve health outcomes for people with diabetes and comorbid depression, it is important to understand the prevalence and distribution of depression. study (Hussain, et al, 2018) found a high prevalence of depression among type 2 diabetes mellitus patients. Diabetes management programs may consider early screening of depression in type 2 diabetes mellitus patients. The study will attempt to identify the prevalence of depression among type 2 diabetes patients in Jordan.

METHOD AND MATERIALS

In this study, informed consent was obtained directly from the patients. In addition, participants underwent depression screening using the Depression Scale. This scale consists of (30) Item. The researcher developed the depression scale by referring to many previous studies such as the study (Randvali, et al, 2024; Weiss, et al, 2024; Chireh, et al, 2024; Khawagi, et al, 2024; Haji-Arabi, et al, 2024; Eskandari, et al, 2024) where the scale was (30) item in an attempt to determine the degree of depression in patients. The paragraphs were distributed to suit the patients and the scale was a five-point scale (very strongly agree, strongly agree, moderately agree, litel agree, very litel agree). The researcher descriptive survey approach, where the scale was prepared electronically through Google Forms, and the study sample's approvals were obtained to participate in the study by filling out forms specific to scientific research ethics. It was clarified that the study is used for scientific research purposes and that the information is treated with complete confidentiality. At the end of the test, each

patient's final score was calculated to determine if they suffer from depression and the severity of their depression, and a comprehensive interview was conducted with each patient. The study included (390) patient (200) men and (190) women. The ages of the participants ranged from 18 to 80 years. Patients were randomly selected during their visit to the Northern crossing primary medical center in Jordan. Table1 shows the characteristics of the study sample according to demographic variables.

Table 1: Characteristics of the study sample according to demographic variables (n=390)

demographic variables	Level	Frequency	Percent
Gender	Male	200	51.2%
	Female	190	48.8%
Age	(18-30)	33	8.4%
	(31-40)	38	9.7%
	(41-50)	41	10.5%
	(51-60)	138	35.3%
	(61-75)	76	19.4%
	More Than 75	64	16.4%
Total		390	100.0%

Table 1 Show that the study sample was distributed equally among males and females with type 2 diabetes, and the ages of the patients (138) had the highest percentage in the study sample, reaching (35.3%). Table 2 show Diagnostic reference values type 2 diabetes mellitus.

Table 2: Diagnostic Reference Values Type 2 Diabetes mellitus.

Parameters	Normal	Prediabetes	Type 2 Diabetes Mellitus
Haemoglobin, A1c	<5.7% (American Diabetes Association)	5.7-6.4% (American Diabetes Association)	≥6.5%
	<<6.0% (World Health Organization)	6.0-6.4% (World Health Organization)	
Fasting Plasma Glucose	<100 mg per dl (American Diabetes Association)	100-125 mg per dl (American Diabetes Association)	≥126 mg per dl
	<110 mg per dl (World Health Organization)	110-125 mg per dl (World Health Organization)	
Tow-hour plasma (oral glucose tolerance test)	<140 mg per dl	140-199 mg per dl	≥200 mg per dl

The researcher extracted the construct validity indications for the scale. He extracted the correlation coefficients of each paragraph with the total score, in a survey sample from outside the study sample consisting of (30) patients. The correlation coefficients of the paragraphs with the tool as a whole ranged between (0.45-0.79), and the following table shows that.

Table 3: Correlation coefficients between the paragraph.

No. Item	Correlation coefficients	No. Item	Correlation coefficients
1	0.58**	16	0.46*
2	0.61**	17	0.59**
3	0.53*	18	0.70**
4	0.79**	19	0.65**
5	0.57**	20	0.46*
6	0.66**	21	0.70**
7	0.59**	22	0.66**
8	0.64**	23	0.70**
9	0.59**	24	0.62**
10	0.54*	25	0.60**
11	0.62**	26	0.53*
12	0.56**	27	0.45*
13	0.71**	28	0.58**
14	0.54*	29	0.70**
15	0.62**	30	0.62**

Table 3: Show That all correlation coefficients were of acceptable degrees and statistically significant, and therefore none of these paragraphs were deleted. the researcher verified the stability of the study tool by using the test-retest method by applying the scale and reapplying it two weeks later to a group from outside the study community and outside its sample consisting of (30) patients. Then, the Pearson correlation coefficient was calculated between their estimates in the two times. The stability coefficient was also calculated using the internal consistency method according to the Cronbach alpha equation, and these values were considered appropriate for the purposes of this study.

RESULT

The researcher extracted the means and standard deviations to determine the degree of Prevalence of Depression Among Type 2 Diabetes Mellitus Patient, as shown in Table 4, 5.

Table 4: Means and Standard Deviations to Prevalence of Depression Among Type 2 Diabetes Mellitus Patient.

	Mean	SD	Rank
Prevalence of Depression	3.88	0.974	High

Table 4 shows That the Prevalence of Depression Among Type 2 Diabetes Mellitus Patient was high.

Table 5: Means and Standard Deviations to Prevalence of Depression Among Type 2 Diabetes Mellitus Patient according to demographic variables (n=390).

	Variable	Mean	SD	Rank
Prevalence of Depression	Male	3.86	0.974	High
	Female	3.90	0.884	High
	(18-30)	3.84	0.784	High
	(31-40)	3.92	0.935	High
	(41-50)	3.78	0.669	High
	(51-60)	4.02	0.739	High
	(61-75)	3.87	0.947	High
	More Than 75	3.87	0.881	High

Table 5 shows That the Prevalence of Depression Among Type 2 Diabetes Mellitus Patient according to demographic variables (Gender, Age) was high.

The researcher applied linear regression to reveal the effect of Type 2 Diabetes Mellitus on the increase in the incidence of depression, and Table 6 shows that.

Table 6: Linear Regression.

Independent Variables	Value T	Sig Of T	B	Dependent Variables	r	r^2	Value F	Sig of F
Type 2 Diabetes Mellitus	19.779	0.000	0.976	Prevalence of Depression	0.848	0.719	391.207	0.000

Results of a simple linear regression analysis assessing the effect of Type 2 Diabetes Mellitus on the depression variable. The independent variable, Type 2 Diabetes Mellitus, shows a significant effect on depression, indicated by a t-value of 19.779, with a statistical significance of (0.000). Less than (0.05), indicating statistical significance. The unstandardized factor B of 0.976 indicates a strong positive relationship, meaning that for Type 2 Diabetes Mellitus, there is a significant expected increase of 0.976 units in depression, and the correlation coefficient (r) value was (0.848), and the value of (r2) was (0.719), which represents the proportion of the influence or explanation of the independent variable on the dependent variable.

DISCUSSION

The initial objectives of the study were to determine the prevalence of depression in Type 2 Diabetes Mellitus. Thus, all study participants had a diagnosis of depression, and it was found that all patients with Type 2 Diabetes Mellitus, more than 95%, suffer from depression. in varying degrees, from mild to moderate to severe and very severe. This study is consistent with (DeFronzo, et al, 2015; Olokoba, et al, 2012; Hussain, et al, 2018) a that showed that people with Type 2 Diabetes Mellitus are much more likely than other people to suffer from depression.

Such a study suggests that patients with Type 2 Diabetes Mellitus may be susceptible to certain internal and environmental factors that may be responsible for this problem. There have been many researches and perspectives on this topic. Since the populations studied were different and live in the same environments, it is expected that the percentages will vary from study to study. This is what (Randvali, et al, 2024; Weiss, et al, 2024; Chireh, et al, 2024; Khawagi, et al, 2024; Haji-Arabi, et al, 2024; Eskandari, et al, 2024) showed in his research and showed the difference in the prevalence of depression in diabetic patients according to the environment and living conditions of the groups participating in the study.

CONCLUSION

The two-way relationship between depression and diabetes has been widely documented. Depression can precede diabetes, or diabetes can promote the onset of an associated depressive condition. The complications of

diabetes itself are a risk factor for the onset of depressive conditions. Patients with diabetes who experience associated depression have poorer glycemic control, a greater number and severity of complications, a poorer quality of life

CONFLICTS OF INTEREST

The author declare that they have no conflicts of interest.

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