Prevalence of depression among diabetic patients and the factors affecting it

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Abstract:

Background

Diabetes mellitus is a common chronic disorder and one of the main causes of death in the world.

Coping with such chronic disease can cause depression as patients have to deal with their disease putting a lot of attention on blood glucose monitoring, insulin and other medications.

Objectives

To estimate the prevalence of depression among diabetic patients and the factors affecting it.

Subjects and methods

A cross-control study was conducted using an anonymous web-based questionnaire. A total of 424 patients from Saudi Arabia took part in this survey during the period from 07-November-2017 to 28-November 2017.

Participants were asked to fill an anonymous questionnaire about their demographic characteristics, medical history/comorbidities and diabetes history in addition to a depression scale.

Results:

The study included 424 patients. The majority were females

(71.7%), married (54.7%), and aged between 15 and 29 years

old (39.6%). There was no statistically significant difference

among different categories of age (p=0.138), gender

(p=0.292), educational levels (p=0.533), marital status

(p=0.771), and occupation (p=0.362) in terms of affecting

patient's depression score. The same was observed in patients

with diabetic foot (p=0.339), nephropathy (p=0.552),

neuropathy (p=0.101), retinopathy/ glaucoma (p=0.066), and

sexual problems (p=0.446) when compared to patients without

them.

There was a significant difference (p=0.005) observed between

patients with and without cardiovascular complications in terms

of affecting depression score. The mean depression score for patients who suffered cardiovascular complications was much higher (39.93) than that in patient with no such complications (23.15).

Conclusion

Additional research should be conducted to investigate the association between sociodemographics, medical history, comorbidities and depression among diabetic patients in our population. To boost patient's confidence and self-determination in managing diabetes would contribute to better health outcomes.

Keywords

Diabetes, Depression, Questionnaire, Prevalence, Factors.

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Introduction

Diabetes Mellitus (DM), commonly referred to as Diabetes is defined by World Health Organization (WHO) as a group of metabolic disorders characterized by chronic hyperglycaemia resulting from defects in insulin secretion, insulin action or both. Long-term organ damage, organ dysfunction and organ failure are associated with the chronic hyperglycaemia of Diabetes[i]. Possible Diabetes complications can be classified into two major categories; macrovascular and microvascular including Ischemic Heart Disease (IHD), Peripheral Vascular Disease (PVD), and Cerebrovascular Disease (CVD) "macrovascular", and Nephropathy, Retinopathy, and Neuropathy "microvascular" resulting in organ and tissue damage in almost one third to one half of population with diabetes[ii].

According to International Diabetes Federation (IDF)[iii], the three main types of Diabetes are Type 1 Diabetes, Type 2 Diabetes and Gestational Diabetes. Type 1 DM, formerly described as "Insulin Dependent Diabetes Mellitus" (IDDM)[iv] results from β-cells destruction, usually leading to absolute deficiency of insulin. Type 2 DM, formerly described as "Non-Insulin-Dependent Diabetes Mellitus" (NIDDM)[iv] results from a progressive insulin secretory defect on the background of insulin resistance. Gestational

Diabetes, which appears during pregnancy, is associated with increasing the risk of developing type 2 Diabetes in both mother and child later in life[iii].

Globally, the prevalence of mood disorders such as depression and anxiety disorders is higher among individuals with diabetes compared to those without diabetes[v, vi, vii].

The aim of this study was to determine the prevalence of depression and the associated factors among diabetic patients.

Materials and Methods

Subjects:

This cross-sectional study was conducted using an anonymous web-based questionnaire. A total of 53 patients from Saudi Arabia took part in this survey.

Participants were asked to fill an anonymous questionnaire about their demographic characteristics, medical history/comorbidities and diabetes history in addition to a

depression scale concerning how many times they have been

bothered by some problems two weeks before filling the

questionnaire. The study was conducted during the period from

07-November-2017 to 28-November 2017. Institutional review

board approval was obtained before conducting any study-

related procedures.

Data collected:

The questionnaire consisted of 11 questions. The first two

questions were about age and gender. The third question was

"Did you use topical steroid before?"

Statistical analysis:

Data were statistically described in terms of frequencies

(number of cases) and valid percentages for categorical

variables. Mean, standard deviations, minimum and maximum

were used to describe numerical variable. Comparison of

numerical variables between the subgroups was done using

Kruskal Wallis test for non-parametric data. Spearman's

correlation was used to investigate the relationship between

non-parametric numerical variables. P values less than 0.05

were considered statistically significant. All statistical calculations

were done using computer program IBM SPSS (Statistical

Package for the Social Science; IBM Corp, Armonk, NY, USA)

release 21 for Microsoft Windows.

Results:

Participants' characteristics (N=53):

Collecting demographic data from patients revealed that 38

(71.7%) were females while 15 (28.3%) were males. The

majority of patients (n=168) aged between 15 and 29 years old

with a percentage of 39.6%, followed by 12 patients (22.6%)

aged > 60 years old, nine patients (17%) aged between 50

and 90 years old, six patients (11.3%) aged between 40 and 49

years old. The least frequent category was for patients aged

between 30 and 39 years old which was reported in only five

patients with a percentage of 9.4%.

Table (1)

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	304	71.7	71.7	71.7
	Male	120	28.3	28.3	100.0
	Total	424	100.0	100.0	

Age		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	> 60	96	22.6	22.6	22.6
	15-29	168	39.6	39.6	62.3
	30-39	40	9.4	9.4	71.7
	40-49	48	11.3	11.3	83.0
	50-59	72	17.0	17.0	100.0
	Total	424	100.0	100.0	

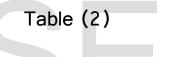Regarding educational level, it was found that the majority of

patients (n=152, 35.8%) were university or post graduates,

closely followed by secondary education that was reported in 18

patients with a percentage of 34%. Ten patients (18.9%)

received primary education and at last, six patients (11.3%)

received intermediate education.

Table (2)

Educational level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Intermediate	48	11.3	11.3	11.3
	Primary	80	18.9	18.9	30.2
	Secondary	144	34.0	34.0	64.2
	University/ Post-graduate	152	35.8	35.8	100.0
	Total	424	100.0	100.0	

The majority of patients (n=232, 54.7%) were married, 19 were

single (35.8%) and only five were divorced (9.4%). Also, the

majority (n=320, 77.4%) were unemployed while only 96

patients were employed (22.6%).

Table (3)

Marital Status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	152	35.8	35.8	35.8
	Married	232	54.7	54.7	90.6
	Divorced	40	9.4	9.4	100.0
	Total	424	100.0	100.0	
Work					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unemployed	320	77.4	77.4	77.4
	Employed	96	22.6	22.6	100.0
	Total	424	100.0	100.0	

Patients were asked if they suffer from diabetic foot, only 40

(9.4%) answered yes while the majority (n=384, 90.6%)

answered no.

They were also asked about any cardiovascular complications

they have, only 72 patients (17%) answered yes while 352

patients (83%) answered no.

It was found that only 16 patients (3.8%) suffered from

nephropathy while the majority (n=408, 96.2%) did not.

In regards to neuropathy, 344 patients (81.1%) reported they

suffered from it while 80 patients (18.9%) reported no.

Only 112 patients (26.4%) reported that they suffered from

retinopathy or glaucoma while 312 (73.6%) answered no.

Patients were also asked about any sexual problems they may have encountered, only 56 patients (13.2%) answered yes while the majority (n=368, 86.8%) reported no.

When patients were asked about when they were diagnosed with diabetes, 192 (45.3%) reported that they were diagnosed more than 10 years ago, 104 (24.5%) were diagnosed 6 to 10 years ago, 80 (18.9%) were diagnosed 1 to 5 years ago and only 40 (9.4%) were diagnosed less than one year ago.

Factors affecting depression among diabetic patients:

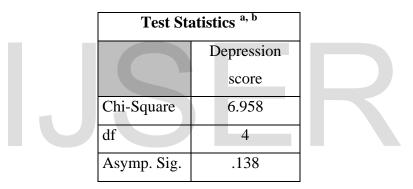The median depression score for the whole sample was 18 (IQR=12.3).

Table (4)

Depression score		
	Statistic	Std. Error

Depression score	Mean		19.080	1.0935
	95% Confidence Interval for Mean	Lower Bound	16.882	
		Upper Bound	21.278	
	5% Trimmed Mean		18.767	
	Median		18.000	
	Variance		59.789	
	Std. Deviation		7.7324	
	Minimum		9.0	
	Maximum		36.0	
	Range		27.0	
	Interquartile Range		12.3	
	Skewness		.531	.337
	Kurtosis		-.810-	.662

There was no significant difference (p=0.138) among age

categories in regards to depression score change. The highest

mean depression score (31.12) was observed in patients aged

between 15 and 29 years old, while the lowest mean score

(18.06) was observed in patients aged between 50 and 59

years old.

Table (5)

	Age	N	Mean Rank
Depression score	15-29	168	31.12
	30-39	32	19.63
	40-49	48	20.17
	50-59	72	18.06
	> 60	80	25.95
	Total	400	

Test Statistics [a, b]	
	Depression score
Chi-Square	6.958
df	4
Asymp. Sig.	.138

In regards to gender, the mean depression score (26.78) for

females was higher than that of males (21.85). However, there

[a] Kruskal Wallis Test
[b] Grouping Variable

was no significant difference (p=0.292) between the two

genders in terms of depression score change.

Table (6)

	Gender	N	Mean Rank
Depression score	Male	104	21.85
	Female	296	26.78
	Total	400	

Test Statistics [a, b]	
	Depression score
Chi-Square	1.108
df	1
Asymp. Sig.	.292

The same was also observed for educational level. There was

no significant difference (p=0.533) among the different

education levels that could change depression score. The

highest mean score (28.45) was observed in patients who

received only primary education and the lowest mean score

(21.94) was found in patients who received intermediate

education.

Table (7)

	Educational level	N	Mean Rank
Depression score	Primary	80	28.45
	Intermediate	48	22.42
	Secondary	128	21.94
	University/ Post-graduate	144	28.06
	Total	400	

Test Statistics [a, b]	
	Depression score
Chi-Square	2.196
df	3
Asymp. Sig.	.533

Regarding marital status, it was found that no significant

difference (p=0.771) in depression score was observed among

the different groups.

Table (8)

	Marital status	N	Mean Rank
Depression score	Single	152	27.32
	Married	208	24.15
	Divorced	40	25.60
	Total	400	

Test Statistics [a, b]	
	Depression score
Chi-Square	.519
df	2
Asymp. Sig.	.771

The same was also observed for work status. No significant

difference (p=0.362) was found between employed and

unemployed patients.

Table (9)

	Work	N	Mean Rank
Depression score	Unemployed	304	26.00
	Employed	88	21.55
	Total	392	

Test Statistics [a, b]	
	Depression score
Chi-Square	.832
df	1
Asymp. Sig.	.362

The mean depression score for patients with diabetic foot was
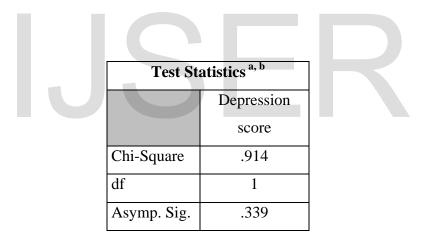
31.4 while it was 24.84 in patients without the disease.

However, there was no significant difference (p=0.339)

between the two groups.

Table (10)

	Do you suffer from diabetic foot	N	Mean Rank
Depression score	No	360	24.84
	Yes	40	31.40
	Total	400	

Test Statistics [a, b]	
	Depression score
Chi-Square	.914
df	1
Asymp. Sig.	.339

The mean depression score for patients who suffered

cardiovascular complications was much higher (39.93) than that

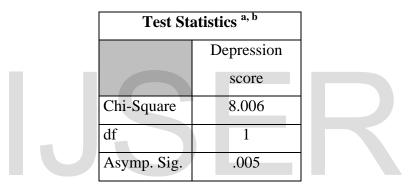in patients with no such complications (23.15). There was a

significant difference (p=0.005) observed between the two

groups in terms of affecting depression score.

Table (11)

	Do you suffer from any cardiovascular complications	N	Mean Rank
Depression score	No	344	23.15
	Yes	56	39.93
	Total	400	

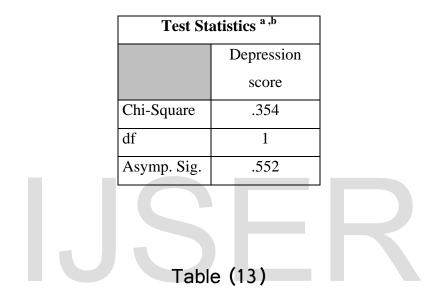| Test Statistics [a, b]	
	Depression score
Chi-Square	8.006
df	1
Asymp. Sig.	.005

Concerning nephropathy, it was found that there was no significant difference (p=0.552) between patients with and without nephropathy. The same was also observed regarding neuropathy (p=0.101).

Table (12)

	Do you suffer from nephropathy	N	Mean Rank
Depression score	No	384	25.25
	Yes	16	31.50
	Total	400	

Test Statistics [a,b]	
	Depression score
Chi-Square	.354
df	1
Asymp. Sig.	.552

Table (13)

	Do you suffer from neuropathy	N	Mean Rank
Depression score	No	312	23.31
	Yes	80	31.60
	Total	392	

Test Statistics [a,b]	
	Depression score
Chi-Square	2.692

df	1
Asymp. Sig.	.101

No significant difference (p=0.066) was found between patients

with and without retinopathy/glaucoma.

Table (14)

	Do you suffer from retinopathy or glaucoma	N	Mean Rank
Depression score	No	288	23.14
	Yes	112	31.57
	Total	400	

Test Statistics [a, b]	
	Depression score
Chi-Square	3.387
df	1
Asymp. Sig.	.066

The mean depression score in patients with sexual problems

was 30.20 while in patients without such problems it was

24.98. However, no significant difference was observed

(p=0.446).

Table (15)

	Do you have any sexual problems	N	Mean Rank
Depression score	No	360	24.98
	Yes	40	30.20
	Total	400	

Test Statistics [a, b]	
	Depression score
Chi-Square	.580
df	1
Asymp. Sig.	.446

As for diabetes duration, the highest mean depression score

was observed in patients who were diagnosed with diabetes less

than one year ago, while the lowest score was observed in

patients who were diagnosed with diabetes one to five years

ago. There was no significant difference (p=0.440) observed

among the different groups.

Table (16)

	When were you diagnosed with diabetes	N	Mean Rank
	Less than 1 year	32	29.63
	1 to 5 years	80	21.20
Depression score	6 to 10 years	104	21.69
	More than 10 years	167	27.84
	Total	392	

Test Statistics [a, b]	
	Depression score
Chi-Square	2.704

df	3
Asymp. Sig.	.440

Discussion

The aim of this study was to determine the prevalence of

depression and the associated factors among diabetic patients.

A total of 424 patients from Saudi Arabia took part in this

survey.

Many studies have been conducted to investigate the

relationship between depression and diabetes in different

populations[vii, viii, ix,x].

Identifying diabetic patients' profiles and factors affecting their

depression helped in achieving better health outcomes and

better lifestyle for such patients[x].

In a pilot study conducted in United Arab Emirates, similar

results were found regarding age (p=0.138) and gender

(p=0.292), it was revealed that both had no significant relation to depression existence[xi].

However our study did not show an association between educational level, marital status, occupation, diabetic foot, nephropathy, neuropathy, retinopathy/glaucoma, sexual problems and diabetic history and depression, it showed a significant association between cardiovascular complications and depression existence (p=0.005).

Conclusion

Additional research should be conducted to investigate the association between sociodemographics, medical history, comorbidities and depression among diabetic patients in our population.

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