



## Assessment of the Relationship between Drug Compliance and Depression among Patients with Diabetes Mellitus

<sup>1</sup>Israa Hussein Hamzah\*, <sup>1</sup>Noor Al-Huda A. A. H. Saeed, <sup>2</sup>Israa M. Al-Kadmy

<sup>1</sup>Branch of Zoology, Department of Biology, College of Science, Mustansiriyah University – Iraq

<sup>2</sup>Branch of Biotechnology, Department of Biology, College of Science, Mustansiriyah University – Iraq

### Article information

#### Article history:

Received: May, 31, 2022

Accepted: August, 15, 2022

Available online: October, 20, 2022

#### Keywords:

Depression,

Diabetes mellitus,

Drug compliance

#### \*Corresponding Author:

Israa Hussein Hamzah

[esraahussan17@gmail.com](mailto:esraahussan17@gmail.com)

#### DOI:

<https://doi.org/10.53523/ijoirVol9I2ID192>

### Abstract

Diabetes and depression are highly prevalent conditions and have significant impact on health outcomes. We aimed to assess the relationship between diabetes and depression among patients. Methods: 200 patients diagnosed with diabetes attending diabetes clinics were invited to participate in this study. Results: In this study most of the participants belong to the age group of 61- 70 years, 140 participants are female. Study results indicated that 64 (32%) participants have 6 to 10 years of illness, 49 (24.5%) participants are on treatment for 6 to 10 years of duration, 199 (99.5%) participants are taking oral drugs twice a day, 97 (48.5%) participants have hypertension, 137 (68.5%) participants had no family history of diabetes mellitus and 179 (89.5%) participants do not have any complication currently. In this study, 137(68.5%) participants did not forget to take medication, 177 (88.5%) participants did not stop medication when symptoms are under control, 163(81.5%) participants felt convenient to take medication and 172 (86%) participants did not feel difficulty in remembering to take medication. 96 (48%) patients with diabetes mellitus had high adherence, 74 (37%) participants had moderate adherence and 30 (15%) participants had low adherence. Conclusion: The current study demonstrates slight correlation between depression and diabetes particularly complications.

### 1. Introduction

Diabetes Mellitus (DM) is a group of metabolic disorders characterized by a high blood glucose level (1), it is estimated that 300 million people will have DM by the year 2025 and this number may be will reach 439 million people by the year 2030 with a prevalence of 7.7% of the population (2). It is also estimated that 3.96 million adult diabetics will die of diabetes each year and diabetes will be responsible for 6.8% of all causes of mortality (3). Depression is one of the most common mental health disorders with a lifetime prevalence estimated at approximately 20% of the worldwide population, Depression is common co morbidity in chronic diseases such as diabetes. The prevalence rate of depression is 1.5-2 times higher in patients with type 2 DM (4). Depression in combination with type 2 diabetes is a public health problem (5). Several factors play important roles to ensure effective and efficient service provision for the management of Chronic Diseases (MCD) such as diabetes; among them, patients' adherence to treatment and compliance with medications are considered important factors (6). Possibility of depression in DM is high and factors such as genetic predisposition and disease duration play an

important role in co morbidity caused due to depression (7). Diabetic is a major public health concern and together with depression is adversely affects the life quality and associated from incidence to mortality (7,8). Compared with individuals with diabetes alone those with co-morbid depression have increased disease burden, greater symptoms severity, increased work disability, poorer adherence to diet, to exercise, to anti-diabetic, lipid lowering, and antihypertensive treatment (9). This study was done to assess the relationship between drug compliance and depression among patients with diabetes mellitus.

## 2. Experimental Procedure

The Experimental The study was conducted at the diabetic centre of patients from various strata of the society. The study was conducted after the ethical clearance has institutional ethics committee approval from the principal. Sample: Patients with diabetes mellitus under treatment and who fulfilled the inclusion criteria during the data collection period were recruited to participate in the study. The sample size was calculated as 200.

**Sampling criteria:** Inclusion Criteria: Outpatients who were diagnosed to have diabetes mellitus and under treatment.

**Exclusion criteria:** Patients with acute illness and or with psychiatric problem.

### Description of the tool:

Section A: Background variables; Socio demographic variables: It consisted of age, sex, education, occupation, diet and exercises.

Clinical variables: It consisted of duration of illness, type of the drugs, duration of treatment, frequency of the drugs, co-morbid illness (Hypertension, Bronchial asthma, and renal failure), family history of diabetes and current complication

Section B: Morisky medication adherence scale and Beck's depression inventory.

Assessment of depression as co-morbidity in diabetes mellitus patients using beck depression inventory II scale and assessment of morisky adherence questionnaire diabetic medication.

### Morisky medication adherence scale:

It is a method for assessing patient medication adherence in clinical research. The morisky scale is a validated medication non adherence assessment tool. This validated scale is designed to estimate the risk of medication non adherence. It has been cited in over 70 articles since its publication in 1986. The total morisky score is based on patient responses to eight or four simples, yes or no questions.

### Beck's depression inventory:

It was created by Aaron.T.Beck is a 21 question multiple choice self report inventory one of the most widely used psychometric tests for measuring the severity of depression. There are three versions of the BDI, first published in 1961 and late revised in 1978 as the BDI is widely used as an assessment tool by health care professionals and researchers in a variety of settings.

Scoring of adherence and interpreting the beck depression inventory were as follow: 1 -10 -these ups and downs are considered normal; 11-16 -Mild mood disturbances; 17-20 -Borderline clinical depression, 21-30-Moderate depression, 31-40 -severe depression, Over 40-Extreme depressions.

## 3. Results and Discussion

The data obtained for the present study were analysed using descriptive and inferential statistics. The analysed data were organized under the following section. In this study most of the participants belong to the age group of 61- 70years 73 (36.5%), 140 (70%) participants are female, 72(36%) participants had secondary education, 124 (62%) participants are house wives, 160 (80%) participants didn't follow the diabetic diet and 143(71.5%) participants followed regular exercise (Table 1). Study results indicated that 64 (32%) participants have 6 to 10 years of illness, 146 (73%) participants on oral drugs, 49 (24.5%) participants are on treatment for 6 to 10 years

of duration, 199 (99.5%) participants are taking oral drugs twice a day, 97(48.5%) participants have hypertension, 137 (68.5%) participants had no family history of diabetes mellitus and 179 (89.5%) participants do not have any complication currently (Table 1). In this study, 137(68.5%) participants did not forget to take medication, 151(75.5%) participants did not mistake of medication,176 (88%) participants did not stop taking medication,112(56%) participants did not forget to take medication while travelling, 127(63.5%) participants took medication on previous day,177 (88.5%) participants did not stop medication when symptoms are under control,163(81.5%) participants felt convenient to take medication and 172 (86%) participants did not feel difficulty in remembering to take medication (Table 2). 96 (48%) patients with diabetes mellitus had high adherence, 74 (37%) participants had moderate adherence and 30 (15%) participants had low adherence. The percentage distribution of depression among patient showed that 181 (90.5%) participants with diabetes mellitus had no depression, 2 (01%) participants had borderline Clinical depression, and 6 (03%) participants had mild mood disturbance. There was no association of drug compliance with depression among patient with the diabetes mellitus (Table 3).

The study comprised of most of the Diabetes Mellitus patients belong to the age group of 61 to 70 years. The findings of study were similar to the study conducted by Carole and Oliver (10) the result revealed that a total of 10,430 patients prescribed drugs by a dispensing physician and 16,292 patients received drugs from a pharmacy. Medication adherence was poor in both patients' groups 40% of the study population attained good adherence to oral anti diabetic drug (OADs). There was no significant impact of physician dispensing (PD) on the adherence level any diabetes patients.

The level of depression 181(90.5%) participants had no depression, 6(3%) participants had mild mood disturbance, 2(1%) participants had border line clinical depression, 11 (5.5%) participants had moderate depression. The findings of study were substantiated by (11). Among 125 participants, more 74.4% were depressed, and 88.8 % had diabetes complications; where depression was strongly associated with neuropathy. There was no association between the drug compliance and depression. The findings of study done by (Abdullah S among,etal )(12) to assess the level of depression among patient with diabetes with a sample size of 200. This result revealed that the prevalence of depression among patient with diabetes in the community was found to be 37.5%. Most frequently, depression was mild (42.21%) in nature with severe depression (9.4.5%) seen the least. Several factors were found to be positively associated with depression including female gender, rural residence, unemployment and the status of being unmarried. The presence of diabetic complications and other chronic diseases such as hypertension and obesity also were found to be associated with depression.

This study proved that there is a lack of awareness on diabetes mellitus. The study finding gives the insight to the practicing nurse and helps her to counsel the patients. This knowledge leads them to participate in workshop, camps, quiz, updates, role play, paper presentation etc. on diabetes mellitus and depression, the nursing practice is a form of art and science devoted to develop the physiological and psychological well-being of patient. Nursing services and the patient care are applied based on gained educational knowledge and evidence based research in order to benefit patients. Nursing services are committed to excellence in practice, education, informatics, research, and administration. The nurse takes initiative to conduct the awareness on practice of drug compliance and depression among patients with diabetes mellitus. The current study proved that there is a lack of awareness on practice of drug compliance and depression among patients with diabetes mellitus. This awareness among patients reduces the complications related to diabetes mellitus and depression. The findings reveal that patients need awareness on importance of drug in controlling the diabetes mellitus.

Tables and figures must be embedded in a logical place of the manuscript text in order to make the work of reviewers comfortable. High-resolution figures should be uploaded inside the manuscript. Figures should be inserted in a line not at a fixed page position. If figures or tables contain symbols used for the first time within a manuscript, they must be specified in the legend or footnote. Results should be Times New Roman, justified, regular; font size: 11 single.

Table (1). Table caption should be in the same font and size of the text.

I. Socio demography			Clinical Variables				
	Frequency	Percentage		Frequency	Percentage		
<b>1.Age in years</b>			<b>1.Duration of illness</b>				
a)	10 to 20	1	0.5	a.	less than I year	5	2.5
b)	21 to 30	3	1.5	b.	01yr to 5yrs	31	15.5
c)	31 to 40	5	2.5	c.	06yrs to 10yrs	64	32
d)	41 to 50	24	12	d.	11yrs to 15yrs	48	24
e)	51 to 60	59	29.5	e.	16yrs to 20yrs	35	17.5
f)	61 to 70	73	36.5	f.	21yrs to 25yrs	9	4.5
g)	71 to 80	34	17	g.	26yrs to 30yrs	6	3
h)	81 to 90	1	0.5	h.	31yrs to 35yrs	1	0.5
<b>2.Sex</b>			<b>2.Route of the antidiabetic drugs</b>				
a)	Male	60	30	a.	Oral	146	73
b)	Female	140	70	b.	Injectable	1	0.5
<b>3.Education</b>			<b>3.Duration of treatment</b>				
a.	No formal education	67	33.5	a.	less than I year	5	2.5
b.	Primary education	46	23	b.	01yr to 5yrs	31	15.5
c.	Secondary education	72	36	c.	6yrs to 10yrs	63	31.5
d.	Higher education	7	3.5	d.	11yrs to 15yrs	49	24.5
e.	Graduate	5	2.5	e.	6yrs to 20yrs	35	17.5
f.	Professional qualification	3	1.5	f.	21yrs-25yrs	8	4
<b>4.Occupation</b>			<b>4.Frequency of the drugs</b>				
a.	Retired	24	12	a.	Bd	199	99.5
b.	Employed	16	8	b.	tid	1	0.5
c.	Coolie	33	16.5	<b>5. Co-morbid illness</b>			
d.	House wife	124	62	a.	Hypertension	97	48.5
e.	Political	2	1	b.	Bronchial asthma	5	2.5
f.	Student	1	0.5	c.	Hypertension & Renal failure	1	0.5
<b>5. Diet control</b>			<b>5. Co-morbid illness</b>				
a.	Yes	40	20	d.	Hypertension & Bronchial asthma	2	1
b.	No	160	80				
<b>6. Exercises</b>							
a.	No	57	28.5				
b.	Yes	143	71.5				

e.	No Co-morbid illness	95	47.5
<b>6.Family History of Diabetes</b>			
a.	Yes	63	31.5
b.	No	137	68.5
<b>7.Current complication</b>			
a.	Neuropathy	14	7
b.	Retinopathy.	7	3.5
c.	Nephropathy	0	0
d.	d. No complication	179	89.5

**Table (2).** Table caption should be in the same font and size of the text.

S.No	Description	Frequency	Percentage
1	Did not forget to take medication	137	68.5
	Forgot to take medication	63	31.5
2	Did not mistake of medication	151	75.5
	Mistake of medication	49	24.5
3	Did not stop taking medication	176	88
	Stopped taking medication	24	12
4	Did not forget to taking medication while travelling	112	56
	Forgot to take medication while travelling	88	44
5	Took medication on previous day	127	63.5
	Did not take medication on previous day	73	36.5
6	Did not stop medication when symptoms are under control	177	88.5
	Stopped medication when symptoms are under control	23	11.5
7	Convenient to take medication	163	81.5
	In convenient to take medication	37	18.5
8	Did not feel difficulty in remembering to take medication	172	86
	Difficulty in remembering to take medication	28	14
S.No	Adherence	Frequency	Percentage
1	Low adherence	30	15
2	Moderate adherence	74	37
3	High adherence	96	48

S.No	Level of depression	Frequency	Percentage
1	Normal (0 -10)	181	90.5
2	Mild mood disturbance ( 11-16)	6	3
3	Borderline Clinical depression (17-20)	2	1
4	Moderate Depression (21-30)	11	5.5

**Table (3).** Table caption should be in the same font and size of the text.

Drug Compliance	Depression		X <sup>2</sup>	P valve
	Normal	Depression		
Low adherence	30	0	5.77	>.05
Medium adherence	72	3		
High adherence	85	10		

#### 4. Conclusions

The current study proved that there is a lack of awareness on practice of drug compliance and depression among patients with diabetes mellitus. This awareness among patients reduces the complications related to diabetes mellitus and depression. The findings reveal that patients need awareness on importance of drug in controlling the diabetes mellitus. The current study demonstrates slight correlation between depression and diabetes particularly complications.

**Acknowledgement:** The authors would like to thank Mustansiriyah University (<https://uomustansiriyah.edu.iq/>) / Baghdad, Iraq for its support to complete this work.

#### References

- [1] Z. Roupa, A. Koulouri, P. Sotiropoulou et al., “Anxiety and depression in patients with type 2 diabetes mellitus, depending on sex and body mass index,” *Health Science Journal*, vol. 3, no. 1, pp. 32–40, 2009.
- [2] Shaw JE, Sucre RA, Zimmet PZ. Global estimates for the prevalence of diabetes for 2010 and 2030. *Diabetes Res Clin Pract* 2010; 87: 4-14.
- [3] Roglic G, Unwin N. Mortality attributable to diabetes: Estimates for the year 2010. *Diabetes Res Clin Pract* 2010; 87: 15-19.
- [4] Tran NMH; Nguyen QNL; Vo TH and Le TTA , Ngo NH (2021). Depression Among Patients with Type 2 Diabetes Mellitus: Prevalence and Associated Factors in Hue City, Vietnam, *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy Dovepress*, February 2021 Volume 2021:14 Pages 505–513
- [5] Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: a meta-analysis. *Diabetes Care*, vol. 24, no. 6, pp. 1069–1078, 2001.
- [6] Cesar I. Fernandez-Lazaro, Juan M. García-González, David P. Adams, Diego Fernandez-Lazaro, Juan Mielgo-Ayuso, Alberto Caballero-Garcia, Francisca Moreno Racionero, Alfredo Córdova & Jose A. Miron-Canelo (2019). Adherence to treatment and related factors among patients with chronic conditions in primary care: a cross-sectional study. *BMC Family Practice* (2019) 20:132.
- [7] Almeida OP, McCaul K, Hankey GJ, et al. Duration of diabetes and its association with depression in later life: the Health in Men Study (HIMS). *Maturitas*, vol. 86, pp. 86:3–9, 2016.
- [8] Darwish L , Beroncal E, Sison MV and Swardfager W. (2018). Depression in people with type 2 diabetes: current perspectives. *Dovepress*, vol. 2018, pp 333–343, 2018.
- [9] Taghreed Mohamed El-Shafie\* , Entesar Omar A. El-Saghier and ImanKamal Ramadan. Depression among type 2 diabetic patients. *The Egyptian Journal of Hospital Medicine*, vol. 44, pp. 258 – 271258, 2011.

- [10] Carola A Huber and Oliver Reich (2016). Medication adherence in patients with diabetes mellitus: does physician drug dispensing enhance quality of care? Evidence from a large health claims database in Switzerland. *Patient Prefer Adherence* 2016 Sep 15;10:1803-1809. doi: 10.2147/PPA.S115425.
- [11] Taghreed Mohamed El-Shafie , Entesar Omar A. El-Saghier and Iman Kamal Ramadan, “Depression among type 2 diabetic patients.” *The Egyptian Journal of Hospital Medicine*, vol., 44, pp. 258 – 271, 2011.
- [12] Abdullahi S Aminu, Varalakshmi Chandrasekaran and Sreekumaran Nair, “Depression among patients with diabetes: A community-based study in South India.” *journal of medical science*, vol. 37, no. 6, pp. 237-244, 2017.