



Symptoms of depression and anxiety among a Sample of Type 2 diabetic patients at Primary Health Care in Erbil city

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Abstract

Background and Objectives: Diabetes mellitus (DM) is exceedingly widespread disease with the highest prevalence in the Middle East countries. Co-existing psychological symptoms affect glycemic control and considered as an important problem in achieving target. The objective of this study was to determine the percentage of depressive and anxiety symptoms among diabetes patients.

Methods: This cross-sectional study was conducted among a sample of 300 adult patients with type 2 diabetes who attended Primary Health Care centers in Erbil City during the period from the 1st of July 2016 to the end of 28th of June 2017. The Patient Health Questionnaire (PHQ9) and Diagnostic and Statistical Manual of Mental Disorders DSM-5 questionnaires has been used as diagnostic tools for depression and anxiety. The glycemic control measured using glycated hemoglobin A1C.

Results: The mean age \bar{x} SD of the sample was 54.79 \bar{x} 9.16 years, ranging from 40 to 75 years, the median was 54 years and considerable proportion (44.7%) were of low socio-economic status (SES). Only one quarter of the patients are highly adherent to the treatment. 52.3% of the patients were complaining from anxiety whether mild (28%), moderate (23.3%) or severe (1%). Regarding depression, 58.7% had had depression of different severity. No significant association was detected between anxiety and depression with diabetes control as assessed by glycated hemoglobin A1C ($p = 0.932$) and ($p = 0.220$) respectively. The prevalence of depression among those who follow a healthy diet (53.6%) and who practice physical activity (41.4%) was significantly less ($p = 0.024$).

Conclusion: The study revealed that large percentage of type 2 diabetic patients suffered from anxiety and or depressive symptoms, a results should alert all physicians working in primary health centers to consider these symptoms since they have a direct impact in improving treatment.

Introduction

Diabetes is one of the commonest public health problems affecting 387 million people all over the world, of whom about nine in ten have diabetes type 2 (DM type 2),[1]. Diabetes counted to be the fourth leading cause of death and ill health, and has reached epidemic levels worldwide. Achieving good glycemic control early in course is crucial to prevent occurrence of complications and mortality,[2]. Even though only 53.6% of people with type 2 diabetes achieving target glycated hemoglobin (HbA1c) <7%, [3]. The American Diabetes Association (ADA) and European Association for the Study of Diabetes

(EASD) recommends personalized targets based on various factors, counting patient preferences, needs, values, co-morbidities, duration of diabetes, risk of hypoglycemia, costs and, ensuring a patient-centered approach, [4]. In the UK, National Institute for health and Clinical Excellence (NICE) recommends targets of <6.5% in newly-diagnosed patients and <7.5% in patients on two or more therapies, [5]. Among major reasons for not achieving these targets are comorbid psychological disorders.

Altogether with diabetes, depression and anxiety are considered as major health problems in adult life,[6]

about 10-20% of old persons had depressive symptoms,[7] for individuals with chronic illnesses, the risk is higher at 25 – 33%,[8.]

These disorders disturb quality of life negatively,[9] and had important socioeconomic consequences,[10]. Several studies have found a higher prevalence of depression among diabetics that is responsible for poor glycemic control and complications, [11,12]. Other studies reported the association between depression with physical disability and cognitive impairment which both are increased in diabetics, [13,14].and also suggest that the course of depression is often persistent, [15,16]. The neuroendocrine abnormalities associated with DM, like higher level of cortisol and altered concentration of dopamine may be involved in the development of depressive and anxiety symptoms, [17,18].

The aims of this study are to find out the percentage of depressive and anxiety symptoms among diabetes at primary health care and to identify the association of these disorders with glycemic control and patient's treatment adherence.

Subjects and Methods

A cross-sectional study was carried out during a period between 1st of July 2016 to the 28th of June 2017. Participants recruited through six Primary Health Care centers (Brayatti, Shady, Kurdistan, Nawroz, Enkawa and Shahedan) centers. According to municipality division of Erbil City. These centers are opened daily (except for public holidays), from 8.00 am to 2.00 pm, and on average 100-150 patients are seen on daily bases. A convenience sample of approximately 300 patients was used and systematic random samples (every three day) of DM type 2 patients were taken from these centers.

All Participants interviewed to complete a semi-structured questionnaire which contains close-ended questions, upon giving a verbal informed consent. The questionnaire consists of 4 parts. Section A involved all relevant patients' demographic characteristics. Section B concentrated on questions which focused on symptoms of the depressive and anxiety disorders. Patient Health Questionnaire (PHQ9),[19] a manual published by the American Psychiatric Association (APA) used to measure depression and is chosen because includes diagnostic items that have cut scores. It includes nine questions and participants asked if they are experienced any of the following symptoms over the last two weeks like loss of interest, felling down, change in the sleep, fatigue, moving or speaking slowly feeling bad, poor concentrating on things, poor appetite or overeating and any suicidal thoughts. To survey anxiety symptoms, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), [20] has been used. Its consist of questions such as feeling anxious, unable to control worrying, too much anxiety about different things, difficult in relaxing, restless, easily annoyed or irritable and feeling scared. For each question the response options include not at all (0), several days

(1), more than half the days (2), or nearly every day (3).

The last part of the questionnaire (C) addresses the self-care and adherent to treatment of diabetes by a set of questions that include healthy diet, physically active advice and drug adherence by morisky 8 items adherence questionnaire [21]. HbA1c for participants were analyzed using diasys one HbA1CFS (particle enhanced immunoturbidimetric test) which is a specific immunoassay for human HbA1c in these centers, their blood pressure and BMI also measured. The statistical Package for Social Sciences (SPSS, version 22) was used for analysis. To equate proportion, Chi square test of association has been used and Fisher's exact test if the expected count of more than 20% of the cells of the table was less than 5. A p value of ≤ 0.05 was considered statistically significant. The socioeconomic status (SES) scoring that range from 0-15 was calculated from educational level (0-5), occupation (0-4), home ownership (0-2), crowding index (0-1), car ownership (0-1), and monthly family income (0-2). Scoring lower than 5 is considered as low SES, 6–10 is medium SES, and more than 10 is considered as high SES. The risk of developing depression is calculated and range from 0-27. Then depression was stratified into quartiles, scoring lower than 4 is considered as minimal depression, 5–9 is mild depression, 10-14 moderate, 15-19 moderately severe depression; and ≥ 20 is considered severe depression. The anxiety total score for the 7 items ranges from 0 to 21. Scores of 5, 10, and 15 represent cutoffs for mild, moderate, and severe anxiety, respectively. The treatment adherence scoring ranges from 0-8 Scoring higher than 2 is considered as low adherence, 1–2 is medium adherence, and high adherence if score equal to 0. Diabetes control is defined as HbA1c $< 7\%$.

Ethical issues

Ethical approval for the study was obtained from the Scientific and Research Ethics Committees at Hawler Medical University - College of Medicine a formal permission letter from Erbil General Directorate of Health (DOH) was also obtained to conduct the study

Results

The total number of the studied sample was 300 diabetic patients affected with DM type II. The mean age \pm SD of the sample were 54.79 ± 9.16 years, ranging from 40 to 75 years. The median was 54 years.

More than one third (35.3%) of the studied sample aged 40-49 years, and 34.7% aged ≥ 60 (Table 1). Around half of the samples (52%) were females, and the majorities (69%) were living in urban areas. The majorities (92%) of the sample were married, and considerable proportions (44.7%) were of low socioeconomic status (SES).

Table 1. Socio-demographic characteristics of the studied sample.

Parameters	No.	(%)
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Age (years)		
40-49	106	(35.3)
50-59	90	(30.0)
≥ 60	104	(34.7)
Gender		
Male	144	(48.0)
Female	156	(52.0)
Residency		
Rural	93	(31.0)
Urban	207	(69.0)
Marital status		
Married	276	(92.0)
Single	10	(3.3)
Divorced	1	(0.3)
Widowed	13	(4.3)
SES		
Low	134	(44.7)
Middle	109	(36.3)
High	57	(19.0)
Total	300	(100.0)

More than 90% of the patients were on oral anti-diabetic drugs (OAD), either alone (46%) or combined with insulin (45.3%) as presented in (Table 2). The table shows also that 44.3% of the patients had comorbidities, 61% were on healthy diet, and 23% practice physical activity. Regarding the drug adherence as assessed by Morsky scale, 39.3% of the patients were not adherent (low adherence) to the treatment regimen, while 24% of the patients were highly adherent to the treatment.

Table 2. Some clinical characteristics of the studied sample.

Parameters	No.	(%)
Type of treatment		
OAD	138	(46.0)
Insulin	26	(8.7)
Both	136	(45.3)
Comorbidities		
Yes	133	(44.3)
No	167	(55.7)
Healthy diet		
Yes	183	(61.0)
No	117	(39.0)
Physical activity		
Yes	70	(23.3)
No	230	(76.7)
Morisky adherence		
High adherence	72	(24.0)
Medium	110	(36.7)
Low	118	(39.3)
Total	300	(100.0)

The prevalence rates of anxiety symptoms are presented in (Table 3). The most common and prevalent symptoms were 'Becoming easily annoyed or irritable' and 'Feeling nervous, anxious, or on edge'. The least common symptom was 'Feeling afraid as if something awful might happen' where 57.3% of the patients didn't complain from it.

Table 3. Frequency of anxiety symptoms.

Symptoms	Not at all		Several days		More than half the days		Nearly every day	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Feeling nervous, anxious, or on edge	12	(4.0)	202	(67.3)	79	(26.3)	7	(2.3)
Not being able to stop or control worrying	62	(20.7)	164	(54.7)	68	(22.7)	6	(2.0)
Worrying too much about different things	86	(28.7)	164	(54.7)	48	(16.0)	2	(0.7)
Trouble relaxing	127	(42.3)	116	(38.7)	54	(18.0)	3	(1.0)
Being so restless that it is hard to sit still	116	(38.7)	134	(44.7)	44	(14.7)	6	(2.0)
Becoming easily annoyed or irritable	13	(4.3)	143	(47.7)	106	(35.3)	38	(12.7)
Feeling afraid as if something awful might happen	172	(57.3)	87	(29.0)	35	(11.7)	6	(2.0)

The prevalence rates of depression symptoms are presented in (Table 4). The most common and prevalent symptom was 'little interest or pleasure in doing things'. The least common depression symptom was 'Thoughts that you would be better off dead, or of hurting yourself in some way' where 80% of the patients were not complaining from such a symptom. It is evident that 71.3% of patients were not complaining from this symptom: 'Moving or speaking so slowly that other people could have

noticed. Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual'. Other symptoms are presented in the table. Results showed that more than half of the patients were complaining from anxiety whether mild (28%), moderate (23.3%) or severe (1%), and the rest (47.7%) had no anxiety. Regarding depression, (41.3%) had minimal depression, (24%) had mild form of depression, (31.3%) had moderate form, and only (3.3%) had moderately severe depression.

Table 4. Frequency of depression symptoms.

Symptoms	Not at all		Several days		More than half the days		Nearly every day	
	No.	%	No.	%	No.	%	No.	%
Little interest or pleasure in doing things	14	(4.7)	194	(64.7)	80	(26.7)	12	(4.0)
Feeling down, depressed, or hopeless	81	(27.0)	130	(43.3)	79	(26.3)	10	(3.3)
Trouble falling or staying asleep, or sleeping too much	80	(26.7)	140	(46.7)	74	(24.7)	6	(2.0)
Feeling tired or having little energy	23	(7.7)	178	(59.3)	88	(29.3)	11	(3.7)
Poor appetite or overeating	78	(26.0)	155	(51.7)	64	(21.3)	3	(1.0)
Feeling bad about yourself—or that you are a failure or have let yourself or your family down	94	(31.3)	126	(42.0)	74	(24.7)	6	(2.0)
Trouble concentrating on things, such as reading the newspaper or watching television	174	(58.0)	72	(24.0)	53	(17.7)	1	(0.3)
Moving or speaking so slowly that other people could have noticed. Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	214	(71.3)	76	(25.3)	10	(3.3)	0	(0.0)
Thoughts that you would be better off dead, or of hurting yourself in some way	240	(80.0)	54	(18.0)	6	(2.0)	0	(0.0)

(Table.5) shows no significant association between anxiety and the following socio-demographic factors: age ($p = 0.680$), gender ($p = 0.585$), residency ($p = 0.740$), marital status ($p = 0.538$), and socio-economic status ($p = 0.507$). Other factors had been studied and showed no significant association with

anxiety like smoking ($p = 0.761$), type of treatment ($p = 0.245$), type of insulin ($p = 0.653$), healthy diet ($p = 0.066$), physical activity ($p = 0.655$), HbA1c ($p = 0.932$), drug adherence ($p = 0.411$), and body mass index (BMI) ($p = 0.573$).

Table 5. Factors associated with anxiety.

Factors	Prevalence of anxiety			p
	N	No.	(%)	
Age (years)				
40-49	106	54	(50.9)	0.680
50-59	90	45	(50.0)	
≥ 60	104	58	(55.8)	
Gender				
Male	144	73	(50.7)	0.585
Female	156	84	(53.8)	
Residency				
Rural	93	50	(53.8)	0.740
Urban	207	107	(51.7)	
Marital status				
Married	276	143	(51.8)	0.538*
Single	10	7	(70.0)	
Divorced	1	1	(100.0)	
Widowed	13	6	(46.2)	
SES				
Low	134	75	(56.0)	0.507
Middle	109	53	(48.6)	
High	57	29	(50.9)	
Smoking				
Smoker	55	31	(56.4)	0.761
Non-smoker	206	105	(51.0)	
Ex-smoker	39	21	(53.8)	
Type of treatment				
OAD	138	65	(47.1)	0.245
Insulin	26	15	(57.7)	
Both	136	77	(56.6)	
Insulin				
Long	5	2	(40.0)	0.653*
Mixed	157	90	(57.3)	
Healthy diet				
Yes	183	88	(48.1)	0.066
No	117	69	(59.0)	
Physical activity				
Yes	70	35	(50.0)	0.655
No	230	122	(53.0)	
HbA1c				
Controlled	31	16	(51.6)	0.932
Uncontrolled	269	141	(52.4)	
Adherence (Morisky)				
High	72	34	(47.2)	0.411
Medium	110	56	(50.9)	
Low	118	67	(56.8)	
BMI				
< 25	37	22	(59.5)	0.573
25-29	150	75	(50.0)	
≥ 30	113	60	(53.1)	

*By Fisher's exact test.

(Table.6) shows no significant association between depression and many socio-demographic factors like age ($p = 0.966$), gender ($p = 0.198$), residency ($p = 0.168$), and marital status ($p = 0.315$). The table shows that the prevalence of depression among those of low SES (68.7%) was significantly ($p = 0.002$) higher than the rate among those of middle class (55%), and those of high class (42.1%).

The table shows no significant association between depression and smoking ($p = 0.760$), type of treatment ($p = 0.064$), and insulin type ($p = 0.163$). The prevalence of depression among those who

follow a healthy diet (53.6%) was significantly less than the prevalence (66.7%) among those who don't follow a healthy diet ($p = 0.024$). The prevalence of depression was significantly ($p = 0.001$) less among those who practice physical activity (41.4%) than among those who do not practice exercise (63.9%). No significant association was detected between depression and diabetes control as assessed by HbA1c ($p = 0.220$). The table shows that the more the drug adherence, the less the prevalence of depression ($p = 0.008$). It is evident that the prevalence of

depression was higher among the obese people but the difference was not significant ($p = 0.669$). Despite of the use of Chi-square test showed non-significant association between HbA1c and both depression and anxiety but, using regression to detect the causative effect on depression it's found that type of treatment, physical activity had positive effect on depression with p value (0.020, 0.033) respectively, while drug adherence had significant negative effect on depression with p value (0.018). HbA1c had very

highly significant positive effect on depression with p value (0.000).

Regarding causative effect on anxiety home ownership, SES had very highly significant causative effect on anxiety with p value (0.000), while healthy diet and HbA1c had positive causative effect on anxiety with p value (0.006 and 0.004) respectively. Educational level and occupation had negative causative effect on anxiety with p value (0.009, 0.021) respectively.

Table 6. Factors associated with depression.

Factors	N	Prevalence of depression		p
		No.	(%)	
Age (years)				
40-49	106	62	(58.5)	0.966
50-59	90	52	(57.8)	
≥ 60	104	62	(59.6)	
Gender				
Male	144	79	(54.9)	0.198
Female	156	97	(62.2)	
Residency				
Rural	93	60	(64.5)	0.168
Urban	207	116	(56.0)	
Marital status				
Married	276	161	(58.3)	0.315*
Single	10	8	(80.0)	
Divorced	1	1	(100.0)	
Widowed	13	6	(46.2)	
SES				
Low	134	92	(68.7)	0.002
Middle	109	60	(55.0)	
High	57	24	(42.1)	
Smoking				
Smoker	55	32	(58.2)	0.760
Non-smoker	206	119	(57.8)	
Ex-smoker	39	25	(64.1)	
Type of treatment				
OAD	138	71	(51.4)	0.064
Insulin	26	17	(65.4)	
Both	136	88	(64.7)	
Insulin				
Long	5	5	(100.0)	0.163*
Mixed	157	100	(63.7)	
Healthy diet				
Yes	183	98	(53.6)	0.024
No	117	78	(66.7)	
Physical activity				
Yes	70	29	(41.4)	0.001
No	230	147	(63.9)	
HbA1c				
Controlled	31	15	(48.4)	0.220
Uncontrolled	269	161	(59.9)	
Adherence (Morisky)				
High	72	39	(54.2)	0.008
Medium	110	55	(50.0)	
Low	118	82	(69.5)	
BMI				
< 25	37	21	(56.8)	0.669
25-29	150	85	(56.7)	
≥ 30	113	70	(61.9)	

*By Fisher's exact test.

Discussion

Diabetes has bad effect on the body which can lead to considerable personal and public costs. Despite advocating healthy lifestyle and pharmacologic interventions yet, diabetes still increasing in a significant percentage both in developed and developing countries with high glycemic levels, [22,23]. The association between depression and or anxiety with DM was the interest of health care professionals' years ago. The coexisting of these diseases has bad effects not on glycemic control only but also increase the risk of complications of DM and on the quality of life among patients, [24-27].

The present study revealed that the prevalence of depression and anxiety were high and approximately close to each other among diabetic patients attending outpatient clinics (58.6 and 55.10 % respectively), although previous researches mentioned a higher frequency of anxiety than depression among diabetes. A reasonable explanation could be because the symptoms that we assess for the depression and anxiety have the same score. Unexpectedly, the percentage of patients that had poor glycemic control is 89.66, extremely higher than that detected in previous studies worldwide and the percentage of depression and anxiety among uncontrolled diabetes was 59.9 and 52.4 % respectively. The doctor's reluctance to intensify medication to patient at primary health care may be the reason for this high percent of HbA1c ≥ 7 %.

The depression and anxiety percentages among diabetes are divisive among studies globally. Some studies showed approximately similar results (56.1% [28] and 60.0% [29] for depression) and (55.1% [30] and 57.9% [31] for anxiety) respectively. Other studies in India, Malaysia, and Saudi Arabia reported a lower result (26.3% [32], 26.6% [33] and 22.45% [34] for depression) and (27.6% [32] and 28.5% [34] for anxiety) respectively.

Some reasonable explanations for this high percentage of mental disorders among diabetes in this study could be the poor knowledge and social barriers which make general practitioners to refrain from looking after symptoms of these diseases. The time that the research conducted was during bad political situation (ISIS issue) and corrupt economic state which resulted in many social perplexities and also because of absence of health insurance system. All these factors accumulatively caused relatively high depressive and anxiety symptoms.

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Despite that some depressive symptom was not so popular among patients, like thought of dead, abnormal behavior and poor concentration (80%, 71.3% and 58.0 % respectively) however other symptoms like little interest, feeling down, poor sleep and tiredness were found in 64.7%, 43.3%, 46.7% and 59.3% respectively. The most commonly reported anxiety symptoms were feeling nervous, inability to control worrying and worrying about different things (67.3%, 54.7% and 54.7% respectively) while the least symptoms was feeling afraid and inability to relax (57.3% and 42.3% respectively), this extreme variation in symptoms might be attributed to cultural and religion background of patients.

This study showed that only SES, physical activity, drug adherence and healthy diet were significantly associated with depression ($p=0.002$, $p=0.001$, $p=0.008$ and $p=0.024$ respectively) a results which was not compatible with studies conducted in Chinese study ($p=0.11$),[28] and Tunisian one ($p=0.45$)[24] and compatible with other studies conducted in Saudi Arabia ($p=0.002$)[34] and Jordan,[35]. For anxiety, the present study revealed that no significant association with any studied factors. The recognized high prevalence of depression and anxiety in the present study may be the cause for such non causal association. In addition, in Kurdish society, the interpersonal relationship is very close and it is the responsibility of the family in caring for an emotionally or physical ill member regardless of SES, gender or any other factors.

Whilst when using regression analysis there was positive causative relation between HbA1c and both depression and anxiety. This was the case for some other study that reported positive association between depression and HbA1 ($P=0.022$) [32] Also, some studies reported that anxiety is associated with HbA1c ($p=0,047$) [30].

Conclusion

At least, this study showed a high rate of anxiety and depression for patients with diabetes who consult the primary health care centers and that most of them have a high level of sugar. Which means there is imperfection in the care provided to them and lack of the physicians' attention that requiring immediate intervention from the health authorities and raise awareness among all health care providers.

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اعراض الكآبة والقلق بين عينة من النوع الثاني لمرضى السكري في مراكز الرعاية الصحية الاولى في مدينة اربيل

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الملخص

الخلفية: مرض السكري هو مرض منتشر بشكل واسع مع اعلى معدل انتشار في دول الشرق الاوسط. وجود اعراض النفسية بشكل متزامن مع السكري والذي يؤثر على التحكم في مستويات السكر في الدم وتعتبر مشكلة مهمة في تحقيق الهدف هدف هذه الدراسة هي تحديد نسبة اعراض الكآبة والقلق بين مرضى المصابين بالسكري.

الطريقة: اجريت دراسة مقطعية مستعرضة بين عينة مكونة من 300 مريض والمصابين بمرض السكري من النوع الثاني المراجعين في المراكز الصحية الاولى في مدينة اربيل للفترة بين شهر تموز من سنة 2016 و حتى شهر حزيران من سنة 2017. استبيان صحة المريض 9 ودليل تشخيصي واحصائي اضطرابات النفسية 5 استخدمتا كادوات تشخيصية لكل من الكآبة والقلق. تم تحديد نسبة السكر بالدم بفحص نسبة الهيموغلوبين الغليكوزيلاتي.

النتائج: متوسط العمر والانحراف المعياري للعينات كان $54,79 \pm 9,16$ سنة تتراوح اعمارهم بين 40-75 سنة بمتوسط عمر 45 سنة. نسبة كبيرة منهم (44,7%) كانوا بحالة اجتماعية اقتصادية منخفضة. حوالي ربع المرضى المشاركين في البحث فقط هم الملزمين بالعلاج. (52,3%) المرضى كانوا يعانون من القلق بدرجات متفاوتة خفيف (28%) , معتدل (23,3%) و قلق شديد بنسبة (1%). اما بالنسبة للذين يعانون من الكآبة حوالي (85,7%) يعانون من الكآبة بدرجات متفاوتة. لم يتم الكشف عن اي ارتباط ملموس بين كل من القلق والكآبة مع نسبة السكر المتمثلة بنسبة الهيموغلوبين الغليكوزيلاتي (=0,932) و (=0,220) على التوالي. ان الانتشار الكآبة بين اللذين يتبعون نظام غذائي صحي كان (53,6%) والذين يمارسون النشاطات البدنية (41,4%) وكانت اقل بشكل ملموس (=0,024)

الاستنتاجات: اظهرت نتائج الدراسة بان نسبة عالية من المرضى المصابين بالسكري من النوع الثاني يعانون من اعراض القلق و الكآبة. ان نتائج هذه الدراسة تنبه جميع الاطباء الاخذ بنظر الاعتبار وجود هذه الاعراض بين المرضى لان لها تاثير مباشر في فعالية العلاج و تحسينه.