

## The relationship of anxiety symptoms on self-care management among diabetic patients in Al-Ahsa, Saudi Arabia

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### ABSTRACT

*Aim:* the purpose of the study to investigate the relationship between anxiety and self-care management in patients with DM 2 in Al-Ahsa, Saudi Arabia, and to explore a difference between anxiety and self-care management in patients with DM 2 according to gender and to assess a relationship between anxiety and self-care management in patients with DM 2 according to HbA1c and the difference between anxiety and self-care management in patients with DM 2 according to age groups. *Methods:* The study will follow cross-sectional study design. The sample selected using convenience sample technique and will follow all ethical consideration. The tool for data collection will be 7-item Generalized Anxiety Disorder measurement (GAD-7) and Diabetes Self-Management Questionnaire (DSMQ). Data will be analyzed through (SPSS 22) software. *Results:* There is no significant correlation between GAD-7 and DSMQ in which the P-value is 0.17 and is not less than 0.05 so the null hypothesis is accepted. Additionally, the correlation between GAD-7 and HbA1c is non-significant, and P-value is 0.104. T-test was applied to assess the mean difference of GAD-7 among gender. The P-value is 0.78 so there is no significant difference in mean of GAD-7. *Conclusion:* This study found detections of anxiety symptoms that will help to improve in patient's well-being and for the long-term might affect in less diabetes complications and reduced mortality rate.

**Keywords:** Diabetes mellitus type 2, generalized anxiety disorder, 7-item Generalized Anxiety Disorder measurement, Self-Management Questionnaire.

### 1. INTRODUCTION

Diabetes mellitus type 2 (DM 2) is a chronic endocrine disorder and non-communicable disease and it has a difficulty of control blood glucose levels and an increased risk of developing serious macro-vascular and micro-vascular complications (WHO: Geneva, Switzerland, 2011). The prevalence of



diabetes mellitus is increasing globally in both developed and developing countries in the world (Lozano et al., 2012) and the prevalence of diabetes mellitus in Saudi Arabia was 34.1% in males and 27.6% in females and the average age for onset of diabetes in males and females was 57.5 and 53.4 years (Alqurashi et al., 2011). Anxiety is the most prevalent psychological disorders are estimated in general population. A prevalence of anxiety ranging from 12% to 21%, and it consider the most prevalent psychological disorders (Kessler et al., 2005; Wittchen and Fehm, 2001).

Anxiety disorders are different though and they are a group of mental illnesses, typically present with core characteristics of anxious cognitions, somatic symptoms and behavioral disturbance. The generalized anxiety disorder (GAD) and panic disorder are the major anxiety disorders related with medical illness (Fava et al., 2010; Harter, 2003; Lowe et al., 2003). There are co-morbid psychological disorders in people with DM 2 like depression and anxiety (Stoop et al., 2011). Recent studies show depression is the most investigated psychological disorder associated with diabetes (Ali et al., 2006; Lin et al., 2008), and about 14% of DM2 patients have (GAD) and up to 40% has increased a level of anxiety symptoms (Grigsby et al., 2002). There are many studies about DM and anxiety, Diabetic patients with anxiety have a susceptibility to reveal poor DM self-care management behaviors; they demonstrate inadequate adherence to medications, and have higher HbA1c levels (Lin et al., 2004).

In (Albikawi et al., 2015) there is a study assesses the levels and prevalence of depression, anxiety, and stress and to identify factors correlated with these emotions among Jordanian patients with DM 2. Some of participants who had moderate-to-extremely severe levels of depression, anxiety, and stress and their levels were associated with the presence of diabetes complications and other chronic illness. The meta-analysis study found there are significant and positive relationships between diabetes and anxiety disorders (Smith et al., 2013). Even though the frequent co-morbidity (anxiety) among diabetic patients, the studies research are lack to investigating the relationship between Anxiety and self-care management in diabetic patients type 2, but it is better to elevate level of anxiety in DM 2 patient and if it is association with self-care management in Al-Ahsa, Saudi Arabia because diabetes mellitus consider one of the most prevalent chronic disease in Saudi Arabia and there are high prevalence of uncontrolled diabetes, and many patients who come to hospital with diabetic complications, and some of them complain of psychological symptoms that may lead to complicate their condition.

The aim in our study to investigate the relationship between anxiety and self-care management in patients with DM 2 in Al-Ahsa, Saudi Arabia, and to explore a difference between anxiety and self-care management in patients with DM 2 according to gender and to assess a relationship between anxiety and self-care management in patients with DM 2 according to HbA1c and the difference between anxiety and self-care management in patients with DM 2 according to age groups.

## 2. METHOD

### Design and Sampling

This is cross-sectional study was conducted in 2021, the sample size was calculated through convenience sampling technique so the sample size is minimally (n=100). Patients with DM2 were included in the study if they are patients equal or older than 25 years of age, patients who is able to read Arabic and patients who are Saudi and living on Al-Ahsa. A completed questionnaire from 113 diabetic patients was received.

### Ethical Consideration

This exploratory study was approved by the Collage of Medicine Institutional Review Board at King Faisal University, Saudi Arabia. All participants take written consent prior any data collection. A cover letter on each questionnaire, which included explanation about the purpose of the study, the use of data, the benefits of doing this research, the right to participate, complete the survey or not, and the confidentiality and anonymity of the data. All participants' data were secured and saved in the investigator's personal computer; the investigator was the only person who has an access to the study data.

### Data Collection and Measurement

Online survey was conducted from 15 January to 15 February, 2021. The questionnaire was divided into 3 sections. The first section (6 questions) contained the demographic data age, gender, age for diagnosis with DM, follow up either on primary care center or hospital, Data about the most recent HbA1C, presence of any diabetes complications of DM (e.g., retinopathy, nephropathy, neuropathy, and diabetic foot ulcers/amputations), cardiovascular disease or Hypertension. The second section include the validated Arabica version of seven-item General Anxiety Disorder questionnaire (GAD-7) as per (Diagnostic and Statistical Manual of Mental Disorders-IV-TR) and each item had four options 0 (not at all), 1 (several days), 2 (more than half of days) and 3 (nearly every days) (Alghadir et al., 2020). Total possible score ranges from 0 to 21, with cut off scores  $\geq 5$  mild,  $\geq 10$  moderate and  $\geq 15$  severe

level of anxiety. The thirds section comprised the Diabetes Self-Management Questionnaire (DSMQ) to assess self-management behaviors related to glucose management, dietary Control, and physical Activity in the last 8 weeks. The DSMQ include 16 items which are scored on to 4 scales, 0 (does not apply to me), 1 (apply to me some degree), 2 (applies to me to a considerable degree, 3 (applies to me very much). total scores are 48, when there are higher that will achieve the successful self-management behavior. The original English questionnaire was translated to Arabic and back translation to English to confirm accuracy and reliability (Stoop et al., 2011).

**Data Analysis**

The International Business Machines (IBM) Statistical Package for the Social Sciences version 22 (SPSS) used to analyze the data. The descriptive analysis was done to display mean, standard deviation, frequencies for a categorical data, and ANOVA was used to assess any different between two categorical data and T-test to assess the different between categorical data and continuous data. The results were considered statistically significant when P= 0.5 at a 95 % confidence interval.

**3. RESULT**

In this study 113 participants who were diagnosed as Diabetes Mellitus type 2 (DM2) were evaluated for the generalized anxiety disorder using generalized anxiety disorder assessment-7 (GAD-7) and the self-management of DM2 using Diabetes Self-Management Questionnaire (DSMQ). Out of 113 participants 57 (50.4%) were male and 56 (49.6%) were female, the age group was divided to three groups in which the most of them 60 (53.1%) are between 50-65 years. Our participants are following up for DM2 at hospital and primary health care 62 (54.9%) and 51 (45.1%) respectively. General characteristics are displayed in (Table 1).

<b>Table 1 General characteristics</b>		
Variable N=113		<b>Total % N=113</b>
Gender %	Male	<b>57 (50.4%)</b>
	Female	<b>56 (49.6%)</b>
Age %	25-49	<b>42 (37.2%)</b>
	50-65	<b>60 (53.1%)</b>
	65<	<b>11 (9.7%)</b>
HbA1c	Mean	<b>8.69</b>
	Maximum	<b>22</b>
	Minimum	<b>5</b>
	Range	<b>17.2</b>
	St. Deviation	<b>2.97</b>
Follow-up	PHC	<b>51 (45.1%)</b>
	Hospital	<b>62 (54.9%)</b>

Diabetes complications have been a great effect on self-care management, the hypertension had high present about 53 patients then retinopathy 30 patients have nephropathy, and 21 patients with neuropathy. 34 of patients they didn't have any on complication (Figure 1). For assessment of anxiety GAD-7 are used in which the mean among our participant is 7.80 which is considered as mild anxiety in our sample some patient shows sever anxiety in the which the scored >16 and some shows no anxiety (Table 2). Multiple variables were used to assess self-management in DM2 patient, patient was asked about their glucose management and their mean score was 4.07 of total of 10. Patient shows poor control of their diet and physical activity and their mean score is 3.92 and 3.05 respectively. Participant shows a moderate degree of using health care facility and their means is 4.51. Patient admitted that their control of DM is poor, and their mean is 2.98. All on all, the mean score of Diabetes Self-Management Questionnaire (DSMQ) is 18.55 and the highest score is 35.94 and the lowest score is 0.67 (Table 3).

Table 2 Generalized Anxiety disorder assessment in DM2					
Variables N=113	Mean	Maximum	Minimum	Range	Std. deviation
Generalized Anxiety disorder assessment (GAD-7) (Max=21)	7.80	21	0	21	5.443

Table 3 Diabetes Self-Management Questionnaire (DSMQ) In DM2					
Variables N=113	Mean	Maximum	Minimum	Range	Std. deviation
Glucose management (Max=10)	4.07	8	0.67	7.33	1.60
Dietary control (Max=10)	3.92	7.5	0	7.5	1.43
Physical Activity (Max=10)	3.05	8.89	0	8.89	1.75
Health care-use (Max=10)	4.51	8.89	0	8.89	2.07
Control of my DM (Max=10)	2.98	10	0	10	3.37
Diabetes Self-Management Questionnaire (DSMQ) (Max=48)	18.55	35.94	0.67	35.28	6.59

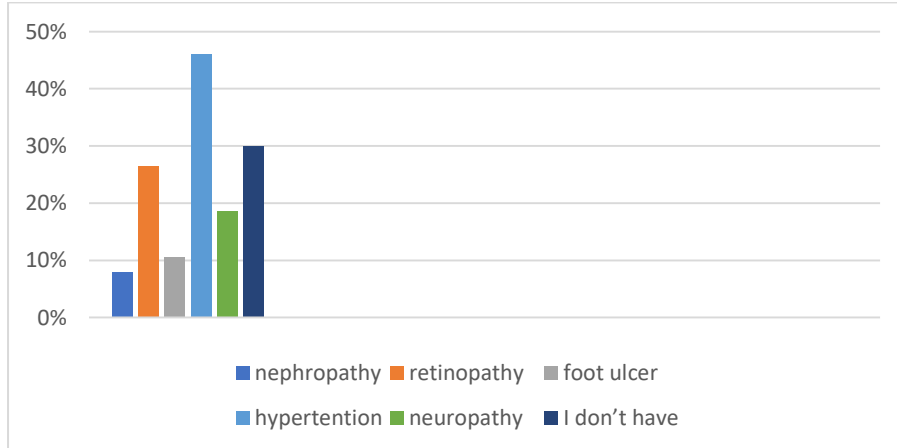


Figure 1 Diabetes complication

There is no significant correlation between GAD-7 and DSMQ in which the P-value is 0.17 and is not less than 0.05 so the null hypothesis is accepted. Additionally, the correlation between GAD-7 and HbA1c is non-significant, and P-value is 0.104 (Table 4 and 5). T-test was applied to assess the mean difference of GAD-7 among gender. The P-value is 0.78 so there is no significant difference in mean of GAD-7. The difference in mean among age groups was tested by ANOVA test and P-value was 0.69 so there is no significant difference in mean between age groups.

Table 4 correlation between GAD-7 and DSMQ				
Variables		GAD-7	DSMQ	Sig. (1-tailed)
GAD -7	Pearson t-test	1	-0.089	0.17

Variables		GAD-7	HbA1c	Sig. (1-tailed)
GAD -7	Pearson t-test	1	0.128	0.104

#### 4. DISCUSSION

This study provides data about the relationship between anxiety symptoms and self-care management in patients with DM type 2. If the anxiety symptoms present does not consider a pathological mental disorder such as major depressive disorder and anxiety disorder. The aim for this study considered these results to be warning signs that must be considered by health care professionals to take proper actions to prevent a possible consequence of pathological mental disease in the future. Result from this study show when there is increase in anxiety symptoms it will decrease in self-care management but there is no significant correlation. The previous study conducted 2015, explore elevated level of anxiety symptoms are significantly associated with poor eating habits only, on another hand, elevated depression symptoms even with or without anxiety symptoms are effect on self-care regimen in different features (Smith et al., 2015) Previous work has recognized increase probability of co-morbid anxiety and depression in diabetic patient (Deschênes et al., 2012). Mitra (2008), report the patient with DM can have a lot of changes association with their lifestyle, such as diet restriction and self-care management of glucose level, all of that contribute to feeling of stress according to their chronic diseases (Albikawi et al., 2015).

In our study, found there is no correlation between anxiety symptoms and HbA1c, even though, if there increase in the level of anxiety symptoms, that is association with increase the HbA1c but not-significant and the mean HbA1c in this study 8.69, that mean the most of participants have high HbA1c. The previous researchers, lack to investigate the relationships between health anxiety and demographic on individuals with DM type 2. In terms of demographics, in this study found there is no difference in age groups and gender. Grigsby et al., (2002) and Li et al., (2008), showing that inverse relationship between the age and general anxiety in individuals with diabetes. Additionally, the study conducted 2014, report diabetic patients with young age had the highest health anxiety, according to results they suggest that individuals became aware about their medical condition with times and anxiety will declines (Janzen et al., 2014). The previous study in Jordanian reported higher levels of depression, anxiety, and stress woman more than man (Chrisler & Mc Creary, 2010; Tamres et al., 2002), they use problem-focused coping, and found woman have less effective managing a stressful event than men (Albikawi et al., 2015).

To our knowledge, this is the first study that discusses the relationship between anxiety symptoms and self-care management in patients with DM types 2 in our community. However, some limitations might impact on the results of this study. First, the sample size might be small to represent the whole issue of anxiety symptoms in diabetic patients. Second, it is better in future to use another value to investigate the relationship between health anxiety and adherence to self-care. Finally, the effective self-management leads to decrease complication DM and load in hospitals.

#### 5. CONCLUSION

This study to examine the relationship between anxiety symptoms and self-care management in patients with DM type 2 in Al-Ahsa, Saudi Arabia. In this study detections of anxiety symptoms will help to improve in patient's well-being and for the long-term might affect in less diabetes complications and reduced mortality rate.

#### Disclosure statement

The authors have nothing to disclose

#### Recommendation

Our result shows the diabetic patients may have moderate to severe level of anxiety. I recommend to do screening in primary care center to asses anxiety for un-control DM patient; this is going to improve the patient compliance to treatments and decrease progression of disease. I recommend doing more research in other cities to assess level anxiety it might be different according to cultures, family outcomes and hospital capability.

#### Acknowledgement

I want to thank my supervisor Dr. Fathia Omer Mohamed, Consultant Clinical Psychologist and all participants who were welcoming this kind of research to help the community and individual health.

**Ethical approval**

This study was approved by medical ethics committee of King Faisal university (ethical approval code: 90-10-2020).

**Funding**

This study has not received any external funding.

**Conflict of interest**

The authors declare that there are no conflicts of interest.

**Data and materials availability**

All data associated with this study are present in the paper.

**Appendix**

I'm medical intern from King Faisal University, this cross-sectional study to assess the relationship of anxiety symptoms on Self-care management among Diabetic patient in Al-Ahsa, Saudi Arabia, all the information you provided will be dealt with total confidentiality and full anonymity. Your participation is completely voluntary and much appreciated.

**Target group: patient with DM types2 living on AlAhsa**

What is your gender?

Male
female

Age

25-50
51-65
More 65

What is last result for your HA1C?

Where are you taking follow up?

Primary care center
Hospital

Did you have any of these complications?

Nephropathy
Retinopathy
Foot ulcer
Cardiovascular disease
Hypertension
Neuropathy
other

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at all	Several Days	More than half the days	Nearly every day
1) Feeling nervous, anxious, or on edge	0	1	2	3
2) Not being able to stop or control worrying	0	1	2	3
3) Worrying too much about different things	0	1	2	3
4) Trouble relaxing	0	1	2	3
5) Being so restless that it is hard to sit still	0	1	2	3

6) Becoming easily annoyed or irritable	0	1	2	3
7) Feeling afraid as if something awful might happen	0	1	2	3

The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you	Applies to me very much	Applies to me to a considerable degree	Applies to me to some degree	Does not apply to me
I check my blood sugar levels with care and attention. <input type="checkbox"/> Blood sugar measurement is not required as a part of my treatment	3	2	1	0
The food I choose to eat makes it easy to achieve optimal blood sugar levels	3	2	1	0
I keep all doctors' appointments recommended for my diabetes treatment	3	2	1	0
I take my diabetes medication (e. g. insulin, tablets) as prescribed. <input type="checkbox"/> Diabetes medication / insulin is not required as a part of my treatment.	3	2	1	0
Occasionally I eat lots of sweets or other foods rich in carbohydrates	3	2	1	0
I record my blood sugar levels regularly (or analyse the value chart with my blood glucose meter). <input type="checkbox"/> Blood sugar measurement is not required as a part of my treatment	3	2	1	0
I tend to avoid diabetes-related doctors' appointments	3	2	1	0
I do regular physical activity to achieve optimal blood sugar levels	3	2	1	0
I strictly follow the dietary recommendations given by my doctor or diabetes specialist	3	2	1	0
I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control. <input type="checkbox"/> Blood sugar measurement is not required as a part of my treatment	3	2	1	0
I avoid physical activity, although it would improve my diabetes.	3	2	1	0
I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). <input type="checkbox"/> Diabetes medication / insulin is not required as a part of my treatment.	3	2	1	0
Sometimes I have real 'food binges' (not triggered by hypoglycaemia)	3	2	1	0
Regarding my diabetes care, I should see my medical practitioner(s) more often	3	2	1	0
I tend to skip planned physical activity	3	2	1	0
My diabetes self-care is poor	3	2	1	0

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