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Dysfunctional Fear of Progression in Diabetes Mellitus Patients and Association with HbA1 c Level

Esra YANCAR DEMİR[1], Yasemin KAYA[2], Behcet COŞAR[2], Tuba ÖZCAN[2], Özgür ENGİNYURT[2]

[1]Avrasya University, Faculty of Arts and Sciences, Department of Psychology, Trabzon, Turkey

[2]Ordu University, Ordu, Turkey

Abstract

The aim of this research is to assess worries about progression of disease using the Fear of Progression questionnaire (FoP-Q) scale on patients with Diabetes Mellitus (DM) patients. This is the first study which FoP-Q test used in Turkey. This study was performed in Ordu University between January 2014 and June 2014. One hundred and fifty-one type-2 diabetic patients without psychiatric disease were included in the study. Information including analyses of HbA1c in the last 3 months were scanned from the patient files. Patients completed the Hospital Anxiety and Depression Scale (HADS), the Rosenberg Self Esteem Scale (RSES), and the Fear of Progression questionnaire. As the validity and reliability studies of the Turkish FoP-Q have not been completed, to test reliability the Cronbach's alpha coefficient was used to assess internal consistency. In the groups with HbA1c ≤7 and >7, the total FoP-Q scores were not significantly different but the coping subscale was significantly higher (p=0.0001) in the HbA1c ≤7 group. In the HbA1c >7 group the HADS total score (p=0.0023) and anxiety (p=0.0059) and depression (p=0.0097) subscores were significantly higher than the HbA1c ≤7 group. A positive relationship was found between the ability to cope with stress and blood glucose regulation. The coping scores from the FoP-Q test were significantly higher in the patient group with HbA1c ≤7 compared to the patient group with HbA1c >7. This indicates that supporting DM patients by helping them cope will lower their anxiety related to the disease and possibly help to regulate blood glucose levels.

Keywords: diabetes mellitus, fear of progression, HbA1C

Öz

Diabetes Mellitus Hastalarında İlerleme Korkusu Bozukluğu ve HbA1 c Düzeyi ile İlişkisi

Bu araştırmanın amacı, Diabetes Mellitus (DM) hastalarında İlerleme Korkusu anketi (FoP-Q) ölçeğini kullanarak hastalığın ilerlemesine ilişkin endişeleri değerlendirmektir. Türkiye'de FoP-Q testinin uygulandığı ilk çalışmadır. Bu çalışma Ocak 2014 – Haziran 2014 tarihleri arasında Ordu Üniversitesi'nde gerçekleştirildi. Çalışmaya psikiyatrik hastalığı olmayan 151 tip-2 diyabetik hasta dâhil edildi. Son üç aydaki HbA1c analizlerini içeren bilgiler hasta dosyalarından tarandı. Hastalar Hastane Anksiyete ve Depresyon Ölçeği'ni (HADS), Rosenberg Benlik Saygısı Ölçeğini (RSES) ve İlerleme Korkusu anketini tamamladı. Türkçe FoP-Q'nun geçerlilik ve güvenilirlik çalışmaları tamamlanmadığından, güvenirliği test etmek için Cronbach alfa katsayısı iç tutarlılığı değerlendirmek için kullanılmıştır. HbA1c ≤7 ve >7 olan gruplarda toplam FoP-Q puanları anlamlı olarak farklı değildi, ancak başa çıkma alt ölçeği HbA1 c ≤7 grubunda anlamlı olarak yüksekti (p=0,0001). HbA1c >7 grubunda HADS toplam puanı (p=0,0023) ve anksiyete (p=0,0059) ve depresyon (p=0,0097) alt puanları HbA1c ≤7 grubuna göre anlamlı olarak yüksek bulundu. Stresle başa çıkma yeteneği ile kan şekeri regülasyonu arasında pozitif bir ilişki bulundu. FoP-Q testinden elde edilen başa çıkma puanları, HbA1c ≤7 olan hasta grubunda HbA1c >7 olan hasta grubuna göre anlamlı olarak daha yüksekti. Bu, DM hastalarının başa çıkmalarına yardımcı olarak desteklenmesinin, hastalıkla ilgili endişelerini azaltacağını ve muhtemelen kan şekeri seviyelerini düzenlemeye yardımcı olacağını göstermektedir.

Anahtar Kelimeler: diabetes mellitus, ilerleme korkusu, HbA1C

Correspondence / *Yazışma:*
Esra YANCAR DEMİR, Avrasya University, Faculty of Arts and Sciences, Department of Psychology, Trabzon, Turkey

E-mail: edyancar@yahoo.com

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INTRODUCTION

Diabetes Mellitus (DM) is a chronic metabolic disease (Bahar, Sertbaş, & Sönmez, 2006) that increases the risk of morbidity and early death with its macrovascular and microvascular complications in the long term, and therefore, the cost of care is high. Chronic complications are divided into two as macrovascular complications (coronary artery disease, cerebrovascular disease, peripheral artery disease) and microvascular complications (retinopathy, neuropathy, nephropathy) (Eroğlu, 2018). It is thought that stress and worry in people who cannot regulate blood sugar, in spite of regular medical treatment, is an important factor (Altunoğlu et al., 2012). While 14% of diabetic patients fulfill the criteria for generalized anxiety disorder, a high rate of 40% are reported to show signs of only anxiety (Pirildar, 2003; Grigsby, Anderson, Freedland, Clouse, & Lustman, 2002). Mental state changes can affect blood sugar, while blood sugar changes can affect behavior and emotions (Mete, 2008). In people with DM, depression and anxiety may be linked to hyperglycemia and increased levels of HbA1c (Anderson et al., 2002; Papelbaum, 2011; Chiu, Wray, Beverly, & Dominic, 2010).

Anxiety and depression in DM patients and the effects on HbA1 c have been investigated in previous studies on the relationship between self-esteem and quality of life. However, the studies on this topic have used scales developed for people with psychological problems based on ICD (International Classification of Diseases) or DSM (Diagnostical and Statistical Manual of Mental Disorders) criteria to determine anxiety levels (Bahar, Sertbaş, & Sönmez, 2006; Gülseren, Hekimsoy, Gülseren, Bodur, & Kültür, 2001; Pirildar, 2003). The criteria of these scales may not be realistic or appropriate for individuals with the stressor of life-threatening disease.

Since FoP stems from real threat, it is distinct from anxiety disorders. (Hinz et al., 2015) Fear of progression (or fear of recurrence) is a common distressing symptom during the treatment of cancer and chronic diseases (Herschbach & Dinkel, 2014). Scales and inventories to assess disease-specific general stress or specific characteristics of distress such as worry or FoP (fear of progression) have been developed in studies to overcome this problem (Herschbach et al., 2005).

The aim of this research is to assess worries about progression of disease using the Fear of Progression questionnaire (FoP-Q) scale on patients with Diabetes Mellitus (DM) patients. This is the first study which FoP-Q test used in Turkey and it is a rare study conducted in the DM patient group in the literature.

METHODS

It was approved by the Ordu University Clinical Research Ethics Committee. The sample population of the research was consecutive patients with type-2 DM applying to the Ordu University, Medical Faculty-Education and Research Hospital Diabetes clinic between 1 January 2014 and 1 June 2014 who met the exclusion and inclusion criteria. The basic inclusion criteria were; no current and/or previous history of psychiatric disease or treatment, between the ages of 18 and 80, voluntary participation in the study, and no physical or cognitive obstacles to being interviewed or completing the applied scales. Patients with stage 4-5 diabetic nephropathy, moderate and advanced stage and severe non-proliferative diabetic retinopathy, proliferative diabetic retinopathy, lost sense of touch and pain or severe diabetic neuropathy in which motor nerves are affected, unstable angina pectoris, myocardial infarction or interventional procedure those with coronary artery disease, peripheral artery disease that disrupts the extremity circulation, those with amputated legs, Stage 3-4 heart failure patients, stage 3-4 chronic obstructive pulmonary patients, cancer patients, autoimmune disease, chronic infections, and chronic liver disease were excluded from the study. The study group was an early-stage patient group and had no history of hospitalization. One hundred and fifty-one patients were enrolled in the study. Clinical psychiatric interviews were made with the patients. Information was collected with a data collection form prepared by the psychiatrist, the hospital anxiety depression scale, Rosenberg self-esteem scale and the fear of progression questionnaire.

Socio-demographic Data Form

This form was created by the researchers to collect socio-demographic data taking account of the study aims. Gender, age, occupation and education were self-reported by participants.

Hospital Anxiety and Depression Scale (HADS)

This is a self-evaluated scale to measure the risk, level and severity related to anxiety and depression of patients with physical disease applying to first-stage health services

(Zigmond & Snaith, 1983). It has been translated to Turkish and validity and reliability studies have been completed (Aydemir, 1997). It has subscales of anxiety (HAD-A) and depression (HAD-D). It contains a total of 14 questions, of these 7 (odd numbers) measure anxiety and the other 7 (even numbers) measure depression. The scale is provided by a four-point Likert scale. The result of studies in Turkey found the cut-off points for the anxiety subscale are 10/11 while for the depression subscale are 7/8. Accordingly, those with points above this are assessed as being in the risk group. The lowest points a patient can obtain in both subscales is 0 while the highest points are 21.

Rosenberg Self-Esteem Scale

This is a 63 item scale with 12 subscales developed by Morris Rosenberf in 1965 (Rosenberg, 1965). The self-esteem subscale has 10 questions of 4-point Likert type and 5 questions are coded inversely. If desired, the subscales can be used separately in research. Subjects gain points between 0 and 6. A rise in the points obtained from the scale indicates a fall in levels of self-esteem. The scale was translated to Turkish by Çuhadaroğlu (Çuhadaroğlu, 1986) and validity and reliability studies for Turkish were completed by Tuğrul (Tuğrul, 1994). Fear of Progression Questionnaire (Mehnert, Herschbach, Berg, Henrich, & Koch, 2006).

The Fear of Progression questionnaire (FoP-Q) was recently created by Herschbach et al., to evaluate fear of disease advancing in patients with breast cancer, diabetes mellitus and rheumatic diseases (Herschbach et al, 2005). It consists of 43 items and was developed and tested in Germany. It includes 5 subscales of affective reactions (13 items), partnership/family (7), occupation (7), loss of autonomy (7), and coping with anxiety (9). The total score can be calculated by all anxiety subscales and there is a single total score for the coping subscale. Each item is evaluated with a five-point Likert scale (as 1 [never] to 5 [very often]). Points are given as both subscale and total points. The validity and reliability studies for Turkey have not yet been completed. The English version of the scale was translated to Turkish by Coşar et al .

Statistical Analysis

Descriptive statistics of all data are given as frequency, median, minimum and maximum values. As the data did not have normal distribution, the Mann-Whitney U test was used to compare two groups and the Kruskal-Wallis test was used to compare more than two groups. If a significant difference was found by the Kruskal-Wallis test ($p<0.05$) then Dunn's test was used to identify which median caused the difference. Statistical analyses were completed using the SPSS software (v.22, IBM Inc.). A $p<0.05$ was accepted as significant.

RESULTS

The sociodemographic characteristics of the patients are given in Table 1 and DM-related features, treatment, and disease history are given in Table 2.

Table 1: Socio-demographic characteristics of the participants (N=151)

Parameter	*Group*	*Frequency*	*%*
Age	18–40	9	5.96
	40–60	59	39.07
	≥60	83	54.97
Gender	Female	94	62.25
	Male	57	37.75
Marital Status	Married	134	88.74
	Single	5	3.31
	Widowed	9	5.96
	Divorced	3	1.99
Education	Not literate	51	33.77
	Literate	12	7.95
	Primary school	58	38.41
	Middle school	8	5.3
	High school	15	9.93
	University	7	4.64
Occupation	Housewife	85	56.29
	Retired	30	19.87
	Civil Servant	8	5.3
	Self-employed	23	15.23
	Laborer	5	3.31

The adequacy of internal consistency of the FoP scale was tested with the Cronbach's alpha coefficient, which was 0.757 for FoP and 0.651 for HADS. The internal consistency of the HAD scale was below 0.70.

According to HbA1c of ≤7 and >7, the total and subparameters of FoP, HADS and subparameters and self-esteem points were compared. Accordingly, while there was no significant difference found between the two groups in terms of total FoP points, the coping subscale in the

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Table 2: Characteristics related to DM, treatment and history of disease

Parameter	*Group*	*Frequency*	*%*
Duration of disease	0–3	44	29.33
	3–5	19	12.67
	5–10	47	31.33
	10–20	27	18
	≥20	13	8.67
Medication use	Oral anti-diabetics	89	59.33
	Insulin	29	19.33
	O. anti-diabetics + insulin	21	14.01
	Diet	11	7.33
HbA1 c	≤7	52	34.44
	>7	99	65.56
DM in family	Present	98	64.9
	Absent	53	35.1
Accompanying chronic diseases	None	50	33.11
	Genitourinary system	1	0.66
	Cardiovascular system	79	52.32
	Respiratory system	8	5.3
	Cardiovascular system + Endocrine	4	2.65
	Cardiovascular system + Genitourinary system	1	0.66
	Cardiovascular system + Respiratory system	8	5.30

Table 3: Descriptive statistics and Mann-Whitney U test results for all parameters of groups with good and poor blood sugar control

Parameter	*HBA1c*	*n*	*Median*	*Min-Max*	*p-value*
FoP	≤7	52	71.5	29–111	0.86
	>7	99	77.0	0–116	
Affective reaction	≤7	52	27.0	4–38	0.54
	>7	99	27.0	0–40	
Partnership-family	≤7	52	8	0–19	0.43
	>7	99	9	0–25	
Occupation	≤7	52	5.5	0–23	0.11
	>7	99	8	0–23	
Loss of autonomy	≤7	52	10	0–19	0.33
	>7	99	11	0–20	
Coping	≤7	52	22	10–36	0.00***
	>7	99	19	0–34	
HAD	≤7	52	18	3–35	0.00**
	>7	99	21	7–32	
Anxiety	≤7	52	9	0–18	0.00**
	>7	99	11	1–19	
Depression	≤7	52	8.5	0–18	0.00**
	>7	99	10	0–16	
Self-esteem	≤7	52	21	7–30	0.24
	>7	99	20	9–30	

*** Statistically significant according to Mann-Whitney U test (p<0.001). ** Statistically significant according to Mann-Whitney U test (p<0.01).

HbA1c ≤7 group was significantly higher (p=0.0001). The HADS total points (p=0.0023) and both anxiety (p=0.0059) and depression (p=0.0001) subscale points were found to be significantly higher in the HbA1c >7 group compared to the HbA1c ≤7 group (Table 3).

There was no statistically significant difference found between body mass index (BMI) group and total FoP, HADS total and subscale points and self-respect (p>0.05). FoP was compared with affective reaction, partnership/family, loss of autonomy, coping, HADS, anxiety, depression and self-esteem points against diabetes in family with the Mann-Whitney Test. In conclusion for all parameters, there was no effect on points from the family history of diabetes (p>0.05).

When compared in terms of gender, while there was no difference in FoP total points between the genders, the affective reaction points of women were found to be higher by a significant degree compared to the points for men (p<0.05). Similarly, the HADS total, anxiety and depression points for women were found to be higher by a statistically significant amount compared to men (Table 4). All

Table 4: Descriptive statistics and Mann-Whitney U test results for all parameters according to gender

Parameter	*Gender*	*n*	*Median*	*Min-Max*	*p-value*
FoP	F	94	77.5	29–111	0.72
	M	57	72.0	0–116	
Affective reaction	F	94	29.0	4–38	0.018*
	M	57	24.0	0–40	
Partnership-family	F	94	9	0–19	0.95
	M	57	9	0–25	
Occupation	F	94	5	0–23	0.08
	M	57	9	0–23	
Loss of autonomy	F	94	11	0–19	0.83
	M	57	11	0–20	
Coping	F	94	20	10–36	0.54
	M	57	20	0–34	
HADS	F	94	20.5	3–35	0.01*
	M	57	17	7–32	
Anxiety	F	94	11	0–18	0.02*
	M	57	9	1–19	
Depression	F	94	10	0–18	0.03*
	M	57	9	0–16	
Self-esteem	F	94	21	7–30	0.84
	M	57	20	9–30	

* Statistically significant according to Mann-Whitney U test (p<0.05).

Table 5: Descriptive statistics and Mann-Whitney U test results for all parameters according to accompanying chronic diseases

Parameter	*Accompanying chronic diseases*	*n*	*Median*	*Rank average*	*Min-Max*	*p-value*
FoP	1	80	79	81.8	29–114	0.15
	2	8	64	45.1	0–85	
	3	51	72	72.5	29–116	
	4	4	79	88.3	63–97	
	5	8	72.5	64.3	36–96	
Affective reaction	1	80	29	80.8	4–40	0.24
	2	8	18.5	44.4	0–35	
	3	51	24	73	4–38	
	4	4	24.5	78.9	21–37	
	5	8	26.5	77.6	13–37	
Partnership-family	1	80	10	80.5	0–23	0.13
	2	8	5	47.3	0–15	
	3	51	8	74	1–25	
	4	4	12.5	103.1	6–14	
	5	8	7.5	59.5	1–13	
Occupation	1	80	9	80.2	0–23	0.43
	2	8	5	56.9	0–13	
	3	51	9	76	0–23	
	4	4	5	58.4	1–12	
	5	8	4	61.8	2–17	
Loss of autonomy	1	80	11.5	80.9	0–19	0.47
	2	8	9	65.4	0–19	
	3	51	11	68.1	1–20	
	4	4	12	81.6	4–16	
	5	8	12.5	85.4	2–15	
Coping	1	80	20	77.5	6–35	0.71
	2	8	20	61.9	0–28	
	3	51	20	76.6	10–36	
	4	4	22.5	91.5	15–36	
	5	8	20	63.6	12–24	

* Statistically significant according to Kruskal-Wallis test ($p<0.05$). * Different letters represent groups with statistically significant difference according to Dunn test ($p<0.05$). 1=never, 2=seldom, 3=sometimes, 4=often, 5=very often

parameters were compared with treatment method, marital status, occupational situation and educational level and no significant difference was found (Table 5).

The results of the Kruskal-Wallis test showed a difference in HADS points based on accompanying chronic disease ($p<0.05$). To determine which accompanying chronic disease caused the difference, the Dunn test results are expressed as letters beside the rank averages (groups with no common letters are not statistically significant ($p<0.05$). The Dunn test showed that the HADS points of those patients with cardiovascular system (CVS) and respiratory system diseases were higher by a significant degree compared to the points for patients with respiratory system diseases, with no chronic disease, and those with CVS+endocrine system diseases ($p<0.05$) (Table 6).

DISCUSSION

In this study both HADS total points ($p=0.0023$) and subscales of anxiety ($p=0.0059$) and depression ($p=0.0097$) were found to be higher by a significant degree in the HbA1c >7 group compared to the HbA1c ≤7 group.

While there was no significant difference found between the HbA1c ≤7 and HbA1c >7 groups in terms of total FoP points and other subscale parameters, the FoP subscale of coping was found to have significantly high levels in the HbA1c ≤7 group compared to the HbA1c >7 group. When the effect of gender on anxiety and depression is examined women had affective reaction points that were significantly high compared to the points for men ($p<0.05$). In similar fashion the HADS total and anxiety

Table 6: Descriptive statistics and Mann-Whitney U test results for all parameters according to accompanying chronic diseases

Parameter	*Accompanying chronic diseases*	*n*	*Median*	*Rank Average*	*Min-Max*	*p-value*
HADS	1	80	20.5	83.7AB	5–35	0.02*
	2	8	15	57.8B	10–23	
	3	51	18	63.6B	3–31	
	4	4	16.5	60.5B	11–23	
	5	8	22.5	103.6A	19–29	
Anxiety	1	80	11	81.2	1–19	0.09
	2	8	10	66.1	6–13	
	3	51	10	66.2	0–18	
	4	4	8.5	60.6	6–13	
	5	8	12	104.3	10–13	
Depression	1	80	10	84.5AB	2–18	0.02*
	2	8	7	54.1B	0–12	
	3	51	9	64.2B	0–16	
	4	4	8	61.8B	4–11	
	5	8	10	95.4A	6–16	
Self-esteem	1	80	20	73	7–30	0.59
	2	8	20	62.6	12–23	
	3	51	22	83.1	11–30	
	4	4	22	84.3	14–29	
	5	8	21	69.6	9–25	

* Statistically significant according to Kruskal-Wallis test ($p<0.05$). * Different letters represent groups with statistically significant difference according to Dunn test ($p<0.05$). 1=never, 2=seldom, 3=sometimes, 4=often, 5=very often

and depression points of women were found to be higher than for men by a statistically significant level.

In the literature when studies researching the relationship between poor metabolic control of DM patients and psychiatric diseases are examined, it appears that many different results have been obtained. In addition to studies supporting our results that the incidence of psychiatric disorders is higher in diabetic patients with poor blood sugar control (Mazze, Lucido, & Shamoon, 1984; Lustman, Griffith, Clouse, & Cryer PE, 1986) and that anxiety and depressive symptom levels are higher in patients with poor blood sugar control (Eren, Erdi, & Özcankaya, 2003; Kuloğlu et al., 2000), there are studies reporting that there is no relationship between blood sugar control and depression and anxiety (Gülseren, Hekimsoy, Gülseren, Bodur, & Kültür, 2001; Friedman, Vila, Timsit, Boitard, & Mouren-Simeoni, 1998). Our results support the determination emphasized in previous studies that there is a relationship between blood sugar control and anxiety (Bahar, Sertbaş, & Sönmez, 2006; Altunoğlu et al., 2012; Nichols, & Brown, 2003) Compared with the general population patients with diabetes mellitus had more than 6 times the rate of generalized anxiety disorders (Popkin, Callies, Lentz, Colon, & Sutherland, 1988).

DM is a chronic disease which creates the perception of a real threat in individuals with this disease due to the disease itself, its high morbidity and mortality, and complications (Sönmez, & Kasim, 2013; Zimmermann, Herschbach, Wessarges, & Heinrichs, 2011). This is different to the irrational or psychiatric anxiety because the underlying fear is real and independent. As such, a specific tool is needed to assess it and this is why the FoP-Q was developed.

The reliability of the HAD scale as a screening tool to signs of depression and anxiety in those with physical diseases has been proven (Aydemir, 1997). However, the anxiety scale of HADS is not specific enough to reveal the difference increasing the importance of the FoP questionnaire for those with chronic disease. Some of the questions on the FoP-Q inquire directly about disease progression and

whether the patient has similar fears. This is different to the HADS-A items which only assess the patient's general anxiety (Shim, Shin, Oh, & Hahm, 2010).

The coping scale item, separate from other subscales of the FoP-Q, inquires into whether patients can access help from various sources such as relaxation or pleasant activities and whether they can talk to doctors about concerns and fears (Shim, Shin, Oh, & Hahm, 2010). The high coping points obtained by patients with HbA1c ≤7 may indicate that DM patients could benefit from supportive interventions for blood glucose control. This result supports studies in the literature emphasizing the positive relationship between HbA1 c levels and anxiety values (Mazze, Lucido, & Shamoon, 1984; Lustman, Griffith, Clouse, & Cryer, 1986; Eren, Erdi, & Özcankaya, 2003). As a result, we believe that developing the coping skills of DM patients may indirectly provide a protective effect on blood sugar levels and thus on possible complications that may develop in the future.

When the effect of gender on anxiety and depression is examined, while there was no difference in total FoP points between both genders, the affective reaction points of women were higher by a significant degree than men ($p<0.05$). The questions in the FoP-Q scale are directed to the anxiety levels of the individual. In addition to the affective reaction points, the HADS total, anxiety and depression points for women were at a statistically significantly high level compared to men, supporting the literature (Sonmez, & Kasim, 2013; Collins, Corcoran, & Perry, 2009). In a study by Gülseren et al. (2001) they determined that the development of anxiety and depression in diabetic patients was affected by the female gender. Hermanns et al. (Hermanns, Kulzer, Krichbaum, Kubiak, & Haak, 2005) identified that being a woman was a risk factor for anxiety and depression. A study by Lloyd et al. (Lloyd, Dyer, & Barnett, 2000) reported that the anxiety levels of women were found to be high. Our results show that female patients with DM have more risk of developing anxiety disorders. As a result, we believe that it will be beneficial from a psychiatric point of view to be more careful and monitor this patient group more closely.

When examined from the point of view of chronic diseases accompanying DM, for patients with two additional diseases that can severely affect quality of life such as in the cardiovascular system and respiratory system, in addition to DM, the HADS points were found to be higher by a significant level. compared to patients without accompanying disease, those with only additional respiratory system diseases and those with CVS and endocrine system diseases. A second chronic disease accompanying diabetes increases the treatment load of patients (Eren, Erdi, & Özcankaya, 2003; Bilge, Ünlüoğlu, & Yenilmez, 2012). At the same time the obstacles in a person's life increase and as a result may cause an increase in psychiatric problems. Again the development of additional diseases in DM patients may trigger factors such as disruption of the patient's social compliance and/or fear of death and may increase psychiatric problems. As a result during treatment or regular monitoring of other organic diseases that accompany DM in patients, treatment for psychiatric problems should be considered.

Statistical analysis related to the self-esteem of patients did not find any significant difference between groups with HBA1c >7 and HBA1c ≤7, in terms of accompanying chronic disease type, duration of disease or BMI values. Especially when the relationship between BMI and self-esteem is assessed, our results are different to publications reporting a reduction in self-esteem in obese patients (Telch, & Agras, 1994; Kodama, & Noda, 2001). Again in our study in terms of BMI, contrary to studies showing the weight increase and obesity increase anxiety-depression scores (Skinner et al., 2010), our study did not find a significant relationship between the two. The reason for this may be that the majority of our study group had high average age and low educational level. The majority were housewives or retired and as they do not have an active social life, they may receive less negative feedback related to weight. Additionally, they may feel less reflection of the limitations due to their disease. The patients' HADS and FoP-Q total and subparameter scores were compared with type of treatment, marital status, occupation and educational level and no significant difference was found. When the literature is examined, in addition to papers supporting our results there are studies defending the contrary.

It has been observed that anxiety and depression treatment is insufficient in Type 2 DM. Only half of patients receive treatmen (Rubin, Ciechanowski, Egede, Lin, & Lustman, 2004). However as shown by meta-analysis studies, if type 2 DM patients are treated for depression and anxiety, the reduction in psychological problems may be accompanied by glycemic control. It should not be forgotten that not gaining blood sugar regulation in spite of regular medical treatment may be an important factor for stress and worry in people and patients should be directed by their clinician to receive psychiatric support (Altunoğlu et al., 2012). There are a variety of advantages to using a more

specific scale, like FoP-Q, to assess anxiety in patients with chronic disease like DM instead of scales developed for psychiatric diseases. Before all, for patients not given sufficient time due to clinic conditions, in a short time the causes of anxiety related to disease and losses due to progression can be discovered. The scale allows us to reach the true source of worry through the subscales of occupation, partnerships-family, loss of autonomy, and affective reaction, provide appropriate interventions and to ease the patient's anxiety. Additionally, the psychiatric support given to patients may increase coping skills and allow blood sugar control and lower complication rates. It should not be forgotten that simple coping interventions like teaching relaxation techniques, motivating the person by directing toward enjoyable activities and expressing worries and fears can reduce a person's anxiety levels and significantly help them to cope with a depressive mental state.

CONCLUSION

There is a positive relationship between the stress coping skills of a person and blood sugar control. If the coping skills of individuals with DM can be developed, if the worries of the person related to disease are reduced; it may contribute to blood sugar regulation. In chronic diseases like DM instead of using scales based on the general population or psychiatric diseases, the use of the FoP-Q scale to identify worries related to situations that are more true to the real life of patients or that affect quality of life may be a good marker of psychiatric interventions for the clinician.

Since the fear of disease progression affects the treatment and follow-up process of the disease, a similar study can be done for all chronic diseases.

Limitations: Our patient numbers are low and it is a single-center study, making it difficult to generalize our findings. This topic requires broader and multi-centered studies. Additionally, another limitation is that the validity and reliability studies of the scale have not been completed in Turkey.

Ethics Committee Approval: The study was approved by the Clinical Research Ethics Committee of Ordu University (date and number of approval: 17.06.2014 / 2014/1).

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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