

ORIGINAL PAPER**Health-Related Quality of Life Patients with Diabetes Mellitus and Diabetic Foot in the Southeastern Anatolia Region of Turkey****Özlem Ovayolu, RN, PhD**

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Correspondence: Özlem Ovayolu, Assistant Professor , Gaziantep University, Faculty of Health Science, Gaziantep, Turkey. E-mail: oucan@gantep.edu.tr**Abstract****Objective:** This study was conducted to compare quality of life in two groups and to evaluate its relationship with various parameters.**Methodology:** A cross-sectional, population-based study was performed. The study was conducted between May and June 2011 in a hospital located in the Southeastern Anatolia Region. The research population included diabetes mellitus patient (n=99), and patients with diabetic foot ulcers (n=102). The study data was collected using a questionnaire and the Short Form-36. The scale's score may vary from 0-worst possible health status or quality of life to 100-best possible health status or quality of life.**Results:** The mean scores of physical component summary (PCS) of the group with diabetic foot ulcers, and the group with diabetes mellitus group were 18.7 ± 13.8 , 32.7 ± 21.3 respectively and the mean scores of mental component summary (MCS) of them were 18.9 ± 12.1 and 32.8 ± 17.7 ($p<0.001$). It was also found that those having another chronic disease besides diabetes, those who fail to have their feet checked regularly, and those who did not receive any training in foot care had both their PCS and MCS scores low.**Conclusions:** It was found that diabetes mellitus and diabetic foot ulcers decreased quality of life and patients with diabetic foot ulcers in particular had the lowest quality of life. Therefore, it can be recommended that quality of life of patients with diabetes and those with diabetic foot ulcers in particular should be regularly evaluated, both disease-related and sociodemographic characteristics should be considered in terms of the rate at which they can affect quality of life and more weight should be given to patient training especially in foot care.**Key words:** Diabetes mellitus, diabetic foot ulcers, health-related quality of life, Turkey.

Introduction

To maximize quality of life for people with diabetes is to attempt to strike a balance between an individual patient's needs and desires and the imperatives of disease management (Li et al., 2011). Because health related quality of life refers to a person's self-perceived functioning and well-being, and is increasingly used to measure how chronic illnesses interfere with a person's day-to-day life. It has been regarded as "the ultimate goal of all health interventions" (Quah et al., 2011).

Measuring health-related quality of life (HRQoL) in diabetes mellitus is important for several reasons such as dietary restrictions, medication and the actual symptoms of this disease as well as concomitant diseases, all of which may lead to deteriorations in HRQoL. Moreover, the guidelines for treatment of diabetes mellitus emphasize that one of the primary objectives is to improve HRQoL (Papadopoulos et al., 2007).

For this reason, this study was conducted to rate and compare quality of life in two groups, one with diabetes mellitus, another one with diabetes mellitus together with developing diabetic foot ulcers and to evaluate the relationship between some parameters that can affect quality of life of patients with diabetes and diabetic foot ulcers.

Methodology

A cross-sectional, population-based study was performed. The study was conducted between May and June 2011 in a hospital located in the Southeastern Anatolia Region. This study was conducted on 201 Turkish-speaking patients who had been diagnosed with diabetes mellitus, and diabetic foot ulcers before the interview. Patients were classified into 2 groups: diabetes mellitus (n=99) constituted by patients without a diabetic foot ulcers at the time the questionnaire was filled and diabetic foot ulcers (n=102) constituted by patients with one or more foot ulcers. Patients who were unwilling to participate in the study, those with whom communication could not be established and those who failed to complete the question form (n=15) were excluded from the study. The researcher contacted each patient and gave a verbal explanation of the study. Patients were

given a questionnaire that they were asked to fill out independently. If a patient was unable to complete the questionnaire on his or her own, the researcher read the questionnaire items to the patient and recorded the answers. All patients visiting the clinics for diabetes mellitus and diabetic foot treatment were continuously assessed for inclusion in the study.

Measures: The study data was collected using a questionnaire prepared by the investigators with support from the literature and the Short Form (SF)-36 quality of life scale. The questionnaire contained questions related to sociodemographic characteristics, disease-related characteristics of individuals, diabetic foot ulcers, foot care and body mass index (BMI). Patients with diabetes mellitus were asked questions other than those relating to diabetic foot ulcers and were administered the SF-36 quality of life scale. The group with diabetic foot ulcers was asked all the questions in the questionnaire and were administered the SF-36 quality of life scale.

Body mass index: Information on body weight and height were obtained by patients' self-report. BMI was calculated as weight (kilograms) divided by square of height (meters) and values of 18.5 and lower were classified as "underweight", 18.5 to <25 as "normal weight", >25 as "overweight", >30 as "obese" (Hlatky et al., 2010; Barrett & Huffman 2011).

Health-related quality of life: The SF-36 was developed by Ware & Sherbourne (1992) as a comprehensive measure of general health status for use in the Medical Outcomes Study. The Turkish version of SF-36 is composed of 36 items. The scale's score may vary from 0-worst possible health status or quality of life to 100-best possible health status or quality of life. The SF-36 survey yields two comprehensive HRQoL indexes: the PCS and the MCS. Pinar previously validated the use of the SF-36 survey in Turkish patients with diabetes, chronic renal failure, and cardiovascular disease (Pinar, 1995).

Ethical considerations: Consent was received from the patients who were included in the study after they were provided with necessary explanation about the study's objectives. Permission was received from the institution where the research was conducted and approval was obtained from the Ethics Committee.

Data analysis: Descriptive statistics were reported as frequencies, means and standard deviations, medians, and ranges. Chi-square analysis was used for sociodemographic characteristics, disease-related characteristics, BMI, habits and the relationship between two groups. Student t-tests, ANOVA, Mann Whitney U and Kruskal–Wallis tests were used to analyse the relationship between some characteristics and PCS, MCS scores averages of two groups. A correlation analysis was carried out to determine the relationship of disease duration and diabetic foot ulcers with quality of life. Statistical significant levels were set at $p < 0.05$.

Results

Findings on characteristic features of patients

A large number of patients with diabetic foot ulcers (48.0%) and with diabetes mellitus (49.5%) were in the age group of 40 and older; 67.6% of the patient group with diabetic foot ulcers were male and 68.7% of those with diabetes mellitus were female. Both patient groups had low level of education, were married, and had social security and moderate income. The majority of both the group with diabetic foot ulcers and that with diabetes had overweight BMIs with no alcohol or smoking addiction (table 1).

Findings on some disease-related characteristics of patients

Most of patients with diabetic foot ulcers had the disease between 11 and 15 years, used insulin and had complications due to diabetes. Most of patients with diabetes, on the other hand, had the disease between 0 and 5 years, used oral antidiabetic and did not have complications due to diabetes. A large portion of the patients in both groups went for an examination in 0-6 month intervals, adhered to their regimens sometimes, had another chronic disease besides diabetes and had other family members with diabetes (Table 2).

Findings on some characteristics of patients concerning foot care

Most of the patients in both groups failed to have their feet examined regularly, did not inspect their feet, but washed their feet every day, did not have any sweating in their feet, preferred low-heel shoes, checked the inside of

their shoes before wearing them, warmed their feet in natural ways and had no knowledge of foot care. 28.4% of those with diabetic foot ulcers and 43.4% of those with diabetes cut their nails straight (table 3).

Findings on the characteristics of patients with diabetic foot ulcers concerning diabetic foot ulcers

Around 37.3% of the patients with diabetic foot ulcers were at grade 2 according to Wagner classification, 65.7% had diabetic foot ulcers for a period ranging from 0 to 6 months, most of them had their ulcers developing in the middle or back of their feet, 51.0% had amputation, amputations were mostly in the toes and had their diabetic foot ulcers develop suddenly.

Findings on the comparison of the mean scores of physical and mental quality of life of the group with diabetic foot ulcers and the group with diabetes mellitus

The mean scores of physical quality of life of the group with diabetic foot ulcers, and the group with diabetes mellitus were found to be 18.7 ± 13.8 , 32.7 ± 21.3 and their mean scores of mental quality of life 18.9 ± 12.1 , and 32.8 ± 17.7 respectively and this outcome was statistically significant ($p < 0.001$).

Findings on the comparison of the mean scores of physical and mental quality of life of the group with diabetic foot ulcers and the group with diabetes mellitus

The patients with diabetic foot ulcers who were between 55 and 69 years of age had the highest PCS scores and those in 40-54 age group the highest MCS scores; the patients with diabetes who were in 25-39 age group had the highest PCS scores and those aged 70 and over the highest MCS scores ($p > 0.05$). Males in both groups had higher PCS and MCS scores than females, quality of life improved as education level increased, the PCS and MCS scores of singles were higher than those of married people and the ones with lower incomes had poorer quality of life. From the patients in the diabetic foot ulcers group, those who were obese had higher scores both in PCS and MCS; from the patients with diabetes, those who had normal BMIs had higher PCS scores and those who were obese higher MCS scores ($p > 0.05$) (table 4).

Table 1. Characteristics of patients with diabetic foot and diabetes mellitus

Parameters	Diabetic foot n (%)	Diabetes mellitus n (%)
Age groups		
25-39	2 (2.0)	10 (10.1)
40-54	33 (32.4)	31 (31.3)
55-69	49 (48.0)	49 (49.5)
70 or ↑	18 (17.6)	9(9.1)
Gender		
Female	33 (32.4)	68 (68.7)
Male	69 (67.6)	31 (31.3)
Education level		
Illiterate	39 (38.2)	48 (48.5)
Primary school	52 (51.0)	45 (45.5)
High school	9 (8.8)	5 (5.1)
University	2 (2.0)	1 (1.0)
Marital status		
Married	99 (97.1)	96 (97)
Single	3 (2.9)	3(3.0)
Social security		
Yes	93 (91.2)	94 (94.9)
No	9 (9.8)	5 (5.1)
Profession		
Employee	10 (9.8)	8 (8.1)
Independent business	37 (36.3)	12 (12.1)
Unemployed	33 (32.4)	69 (69.7)
Retired	22 (21.6)	10 (10.1)
Monthly Income		
High income	5 (4.9)	10 (10.1)
Moderate income	55 (53.9)	60 (60.6)
Low income	42 (41.2)	29 (29.3)
BMI		
Underweight	3 (2.9)	1 (1.0)
Normal	35 (35.2)	23 (23.2)
Overweight	37 (36.4)	40 (40.4)
Obese	27 (26.5)	35 (35.4)
Habits		
Smoking	21 (20.6)	11 (11.1)
Alcohol	2 (2.0)	-
None	79 (77.5)	88 (88.9)
Total	102 (28.0)	99 (27.2)
BMI: Body mass index	n: number	

Table 2. Distribution of disease-related characteristics

Parameters	Diabetic foot n (%)	Diabetes mellitus n (%)	Significance
Duration of diabetes			
0-5 years	10 (9.8)	37 (37.4)	p<0.001
6-10 years	21 (20.6)	26 (26.3)	
11-15 years	32 (31.4)	22 (22.2)	
16-20 years	18 (17.6)	9 (9.1)	
20 ↑	21 (20.6)	5 (5.1)	
Type of treatment			
Oral antidiabetics	7 (6.9)	49 (52.7)	p<0.001
Insulin	95 (93.1)	44 (47.3)	
Frequency of control visits			
0-6 months	56 (54.9)	83 (83.8)	p<0.001
7-12 months	14 (13.7)	11(11.1)	
13 months ↑	32 (31.4)	5 (5.1)	
Presence of complications associated with diabetes mellitus			
Yes	89 (87.3)	39 (39.4)	p<0.001
No	13 (12.7)	60 (60.6)	
Adherence to nutrition program			
Yes	85 (83.3)	85 (85.9)	p=0.382
No	17 (16.7)	14 (14.1)	
Frequency of adherence to nutrition program (n=85)			
Sometimes	50 (58.8)	39 (45.9)	p=0.165
Often	26 (30.6)	30 (35.3)	
Always	9 (10.6)	16 (18.8)	
Presence of any chronic comorbidity			
Evet	90 (88.2)	81(81.8)	p= 0.140
Hayır	12 (11.8)	18 (18.2)	
Family history of diabetes			
Yes	69 (67.6)	69 (69.7)	p=0.436
No	33 (32.4)	30 (30.3)	
Total	102 (28.0)	99 (27.2)	

n: number

Table 3. Distribution of characteristics related to foot care

Parameters	Diabetic foot n (%)	Diabetes mellitus n (%)	Significance
Regular foot examinations			
Yes	17 (16.7)	20 (20.2)	p=0.321
No	85 (83.3)	79 (79.8)	
Foot checks			
Yes	57 (55.9)	63 (63.6)	p=0.164
No	45 (44.1)	36 (36.4)	
Frequency of foot check (n=57)			
Everyday	32 (56.1)	41 (65.1)	p=0.495
Every third day	17 (29.8)	13 (20.6)	
Every second week	8 (14.0)	9 (14.3)	
Frequency of foot washing			
Everyday	60 (58.8)	85 (85.9)	p<0.001
Every 1-3 days	29 (28.4)	12 (12.1)	
More than 3 days	13 (12.7)	2 (2.0)	
Presence of dryness in the feet			
Yes	73 (71.6)	46 (46.5)	p<0.001
No	29 (28.4)	53 (53.5)	
What to do in case of dryness			
I put cream	13 (17.8)	13 (28.3)	p=0.191
I put vaseline	28 (38.4)	11 (23.9)	
I put nothing	32 (43.8)	22 (47.8)	
Presence of sweating in the feet			
Yes	4 (3.9)	30 (30.3)	p<0.001
No	98 (96.1)	69 (69.7)	
Manner of cutting nails			
Straight	29 (28.4)	43 (43.4)	p=0.066
Round	41 (40.2)	35 (35.4)	
Random	32 (31.4)	21 (21.2)	
Selection of shoes			
Flat heeled	81 (79.4)	78 (78.8)	p=0.299
Medium heeled	9 (8.8)	14 (14.1)	
Orthopedic soles	12 (11.8)	7 (7.1)	
Checking inside of shoes			
Yes	53 (52.0)	63 (63.6)	p=0.063
No	49 (48.0)	36 (36.4)	
Warming the feet			
With a heater	32 (31.4)	13 (13.1)	p=0.002
Natural ways (blanket, socks)	70 (68.6)	86 (86.9)	
Training on foot care			
Yes	12 (11.8)	6 (6.1)	p=0.121
No	90 (88.2)	93 (93.9)	
Total	102 (28.0)	99 (27.2)	

n: number

Table 4. The relationship between characteristics of patients with diabetes mellitus and diabetic foot and the mean scores of physical and mental quality of life

Parameters	<u>Diabetic foot</u>	<u>Diabetic foot</u>	<u>Diabetes mellitus</u>	<u>Diabetes mellitus</u>
	PCS Mean±SD	MCS Mean±SD	PCS Mean±SD	MCS Mean±SD
Age groups				
25-39	11.6 ± 8.7	11.8±11.1	43.4±20.8	33.9±21.5
40-54	17.8 ± 14.3	20.3±11.3	33.7±16.8	31.0±18.5
55-69	20.8± 14.4	19.1±13.7	29.3±22.0	32.7±17.8
70 and over	15.4± 11.4	16.3±8.8	34.8±15.9	38.2±16.5
	p=0.424	p=0.570	p=0.211	p=0.745
Gender				
Female	14.5± 9.9	16.0±8.9	28.3±19.8	30.5±16.9
Male	20.7±15.0	20.2±13.2	42.4±21.6	37.7±18.5
	p=0.025	p=0.034	p=0.314	p=0.460
Education level				
Illiterate	16.3±11.7	16.4±10.3	23.5±18.3	27.1±15.1
Primary school	17.4±12.8	18.6±10.5	40.0±20.2	36.6±18.2
High school	34.9±17.2	29.0±20.7	52.0±24.2	48.4±18.6
University	27.9±21.9	27.8 ±19.7	47.5±0.0	53.5±0.0
	p=0.019	p=0.229	p=0.000	p=0.007
Marital status				
Married	18.6±13.8	18.7±12.3	32.4±21.4	32.4±17.6
Single	23.5±15.9	22.8±6.2	41.8±20.9	45.0±18.2
	p=0.546	p=0.319	p=0.439	p=0.245
Monthly Income				
High income	23.7±15.4	20.8±10.5	37.9±17.6	33.4±17.0
Moderate income	21.0±14.8	20.6±12.9	35.9±22.2	36.7±18.2
Low income	15.1±11.6	16.4±11.0	24.1±18.7	24.3±13.8
	p=0.074	p=0.138	p=0.036	p=0.013
BMI				
Underweight	6.9±2.5	8.3±5.1	5.0±0.0	15.6±0.0
Normal	19.8±14.9	18.7±11.9	35.1±23.6	29.8±18.0
Overweight	17.4±13.1	18.9±12.3	33.9±20.7	33.4±17.7
Obese	20.3±13.7	20.2±12.7	30.5±20.7	34.4±17.7
	p=0.305	p=0.304	p=0.388	p=0.506
Total	18.7 ± 13.8	18.9 ± 12.1	32.7 ± 21.3	32.8 ± 17.7

MCS: mental component summary, PCS: physical component summary, SD: Standart deviation

Table V. The relationship between the patients' disease and foot care characteristics and the relationship between their mean scores of physical and mental quality of life

Parameters	<u>Diabetic foot</u>	<u>Diabetic foot</u>	<u>Diabetes mellitus</u>	<u>Diabetes mellitus</u>
	PCS Mean±SD	MCS Mean±SD	PCS Mean±SD	MCS Mean±SD
Type of treatment				
Oral antidiabetics	31.5±18.7	30.8±14.1	33.1±23.7	33.6±19.4
Insulin	17.8±13.0	18.0±11.6	32.1±18.4	31.3±15.9
	p=0.043	p=0.015	p=0.543	p=0.738
Presence of complications associated with diabetes mellitus				
Yes	17.8±13.8	17.9±12.0	21.6±17.6	24.2±15.6
No	25.1±12.3	25.7±11.3	39.9±20.6	38.3±16.8
	p=0.032	p=0.010	p=0.000	p=0.000
Adherence to nutrition program				
Yes	19.6±13.8	19.1±12.0	33.1±20.6	33.6±17.0
No	18.3±14.6	17.9±12.8	30.1±26.3	27.7±21.0
	p=0.812	p=0.569	p=0.454	p=0.217
Presence of any chronic comorbidity				
Yes	17.4±13.2	17.6±10.9	29.2±20.2	30.1±17.0
No	28.3±15.2	28.5±16.7	48.3±19.7	44.6±16.2
	p=0.016	p=0.013	p=0.001	p=0.002
Foot checks				
Yes	21.9±14.4	22.3±13.0	35.3±21.2	35.7±17.9
No	14.6±11.9	14.5±9.4	28.1±21.0	27.7±16.2
	p=0.008	p=0.001	p=0.106	p=0.030
Presence of dryness in the feet				
Yes	17.5±13.8	18.6±12.6	25.8±19.6	28.0±17.0
No	21.7±13.6	19.6±11.1	38.6±21.2	36.9±17.3
	p=0.97	p=0.404	p=0.002	p=0.008
Presence of sweating in the feet				
Yes	8.6±2.7	16.7±7.3	27.8±21.7	31.1±17.2
No	19.1±13.9	18.9±12.3	34.8±21.0	33.5±17.9
	p=0.090	p=0.914	p=0.098	p=0.662
Feet cramps				
Yes	17.3±12.7	17.3±10.0	26.3±18.3	28.4±15.1
No	21.0±15.3	21.3±14.7	44.4±21.9	40.7±19.4
	p=0.183	p=0.104	p=0.000	p=0.001
Training on foot care				
Yes	26.5±14.2	26.7±14.4	56.0±18.8	56.0±14.2
No	17.7±13.5	17.8±11.5	31.2±20.7	31.3±16.8
	p=0.033	p=0.025	p=0.010	p=0.003
Total	18.7 ± 13.8	18.9 ± 12.1	32.7 ± 21.3	32.8 ± 17.7

MCS: mental component summary, PCS: physical component summary, SD: Standard deviation

Findings on the relationship between some characteristics of patients concerning their disease and foot care, and their mean scores of physical and mental quality of life

From the patients with diabetic foot ulcers and diabetes mellitus, those who took oral

antidiabetics and those who adhered to their regimens had higher PCS and MCS scores and those who had diabetes-related complications and those who had another chronic disease besides diabetes had lower PCS and MCS scores. Those in both groups who did not inspect their feet

regularly, who complained about dryness, sweating or cramps in their feet, and who did not have any training in foot care had lower scores in both PCS and MCS (table 5).

As the duration of disease extended in the patients in both the diabetic foot ulcers group and diabetes mellitus group, their PCS and MCS seemed to decline ($p < 0.05$). In the patients with diabetic foot ulcers, extended diabetic foot ulcers and presence of amputation negatively affected the PCS and MCS scores; those who were at grade 1 according to Wagner classification and had a toe amputation had better PCS and MCS scores.

Discussion

Health related quality of life is commonly recognised as a multidimensional concept including domains of physical health and functioning, mental health, social functioning, satisfaction with treatment, concerns about the future and general well-being (Achhab et al., 2008). Diabetes inflicts a significant burden in terms of disability and impaired quality of life persons with diabetes report lower health-related quality of life than the general population. Worse QoL is associated with higher overall mortality in persons with type 2 diabetes. The disease itself can have a negative impact on quality of life (Luyster & Dunbar-Jacob, 2011). It was also observed in this study that the quality of life of the patients with diabetes mellitus was quite lower than that of the healthy group and diabetes negatively affected quality of life in all respects. As expected, this result is parallel to the results of the previous studies made on diabetic patients (Goodridge et al., 2005; Papadopoulos et al., 2007; Al-Shehri et al., 2008; Ovayolu et al., 2008; Verma et al., 2010; Luyster & Dunbar-Jacob, 2011; Fritz et al., 2011; Ucan & Ovayolu 2011; Schunk et al., 2011; Cezaretto et al., 2011; Pettersson et al., 2011). In studies, it was found that quality of life of patients with diabetes was considerably low in all sub-dimensions as compared to control groups (Eljedi et al., 2006; Hashemi Hefz Abad & Shabany Hamedan, 2011). Diabetic patients having lower quality of life than healthy groups has been linked to strict diet restrictions, regular daily use of medication, insulin therapy, symptoms of diabetes and long-term complications. It was also reported that the

restrictions experienced in functional areas, difficulties encountered in work and psychological problems were more common in diabetic patients than in general population (Eren et al., 2004).

While diabetes itself affects quality of life so adversely, diabetic foot ulcer, one of the complications it creates, makes quality of life even worse. Diabetic foot ulcers which diminishes mobility as well as the level of activity and has an impact on the general health conditions and hence on the HRQoL. Likewise, this physical limitation prevents or hampers daily activities, such as personal hygiene and dressing, as well as basic housework, so these patients depend on other family members or caregivers to perform them. On the other hand, patients are forced to leave their jobs, and this increases the psychological and social impact (Goodridge et al., 2005; García-Morales et al., 2011; Salome et al., 2011). In our study, the patients with diabetic foot ulcers were also seen to have distinctly lower scores of both physical and mental quality of life as compared to diabetes mellitus. The studies conducted previously also revealed that patients with diabetic foot ulcers had lower quality of life (Nabuurs-Franssen et al. 2005; Willrich et al., 2005; Evans & Pinzur, 2005; Ribu et al., 2006; Armstrong et al., 2008; García-Morales et al., 2011; Alzahrani & Sehlo, 2011; de Meneses et al., 2011). Also in studies where quality of life of patients with and without diabetic foot ulcers were compared, it was demonstrated that those with diabetic foot ulcers had lower quality of life (Valensi et al., 2005; Ribu et al., 2007; Jelsness-Jorgensen et al., 2011). The fact that patients with diabetic foot ulcers have lower quality of life as compared to diabetic patients can be explained by the increased need for medication and hospital dependence in these patients and the changes in their social and work life. Considering all these factors, it is an expected result that quality of life of patients with diabetic foot ulcers is adversely affected.

Many studies showed that some disease-related factors and socio-demographic characteristics also affected quality of life in diabetic patients (Goodridge et al., 2005; Al-Shehri et al., 2008; Verma et al., 2010; Quah et al., 2011). Our study also demonstrated that there was a negative

relationship between duration of disease and quality of life in both patient groups; quality of life of those who had complications due to diabetes and those who had another chronic disease besides diabetes was adversely affected. As can be seen from these results, as duration of disease lengthens, the risk of developing complications increases and this situation affects quality of life negatively. Studies made on patients with diabetes mellitus showed that as duration of disease extended, quality of life deteriorated (Eren et al., 2004; Eren et al., 2008; Hashemi Hefz Abad & Shabany Hamedan, 2011) and one of the factors which adversely affected quality of life was the presence of diabetes-associated complications (Goodridge et al. 2005; Quah et al., 2011). The results we obtained from our study support the results obtained from previous studies (Goodridge et al., 2005; Papadopoulos et al., 2007; Quah et al., 2011; Luyster & Dunbar-Jacob, 2011).

Various studies showed that women, those married, and those with low level of education and income had poorer quality of life (Wandell 2005; Goodridge et al., 2005; Papadopoulos et al., 2007; Al-Shehri et al., 2008; Eren et al., 2008; Quah et al., 2011; Schunk et al., 2011; García-Morales et al., 2011; Salome et al., 2011; Urzua et al., 2011; Rodríguez-Pascual et al., 2011). Also in our study, those married, women and those with low level of education and income from the diabetes mellitus, and diabetic foot ulcers had lower PCS and MCS scores. A lower quality of life in married people may be explained by the broad family structure originating from the traditional characteristics of the Southeastern Anatolia Region in particular and the responsibilities inflicted by marriage. Moreover, low level of education leads to poor socio-economic conditions and therefore lower quality of life, a situation, which affects diabetic patients negatively. Women having lower quality of life in all two groups than men may be associated with women's social status, social role and expectations, because the role and responsibilities imputed to women in Turkish society show considerable differences as compared to men; women are held primarily responsible for duties such as housework and child-care no matter if they work in a job or not. This situation restricts the time women can spare for themselves and exerts difficulties in

undertaking such responsibilities imposed on them and coping with their diseases, and therefore results in affecting their quality of life adversely.

One of the most important reasons of morbidity in diabetes is foot ulcers, a complication that requires long, burdensome and costly treatment. The best and cheapest treatment of such a major problem is protection and the most effective factor in protection is patient education. This problem can be prevented by up to 50% when the feet are regularly inspected, patients are made to adhere to foot care and hygienic measures and appropriate shoes are selected in addition to a good monitoring and treatment of diabetes. Therefore, especially those patients defined as having high risk should be monitored in intervals that are more frequent and regular training should be provided to them. The feet should also be evaluated during every physical examination (Dinççağ, 2011).

In our study, those who failed to regularly inspect their feet, those who had complaints of dryness, sweating and cramps in their feet and those who did not receive any training related to foot care in both diabetes mellitus and diabetic foot ulcers patient groups had low PCS and MCS scores. Extended duration of diabetic foot ulcers and presence of amputation adversely affected quality of life in the patients with diabetic foot ulcers and those with toe amputation had better quality of life. In the study made by Armstrong and associates on patients with diabetic foot ulcers, they found that quality of life of patients with no amputation at all was better as compared to patients with amputation and the level of amputation adversely affected quality of life; patients with major amputation had worse quality of life than those with minor amputation (Armstrong et al., 2008).

Conclusion

In conclusion, it was observed that the patients with diabetes mellitus and diabetic foot ulcers had considerably lower PCS and MCS scores. It was also found that those who had diabetes-related complications and those who had another chronic disease besides diabetes, those who did not inspect their feet regularly, those who complained about dryness, sweating or cramps in their feet, and those who did not have any

training in foot care had lower scores of both PCS and MCS; as duration of disease extended, quality of life deteriorated; duration of having diabetic foot ulcers and presence of amputation negatively affected quality of life of the patients with diabetic foot ulcers.

In view of these results, it can be stated that all health professionals should be aware of the fact that quality of life of diabetic patients will be adversely affected and especially the patients with diabetic foot ulcers may have even worse quality of life. It is also remarkable to come to a conclusion in this study that those who had insufficient knowledge about foot care and those who failed to regularly inspect their feet had their both PCS and MCS scores adversely affected. Patients could be made to carry out more knowledgeable practices especially in foot care by means of very simple measures and regular patient training. In this way, contribution can be made both to diminish complications and to raise quality of life.

Acknowledgements

We would like to thank all the patients who agreed to participate in the study.

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