Depression, Anxiety and Quality of Life of Family Caregivers of Patients with Type 2 Diabetes

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Key Words

Type 2 diabetes · Depression · Family caregiver · Quality of life

Abstract

Objective: It was our aim to investigate the quality of life (QOL) among family caregivers of patients with type 2 diabetes mellitus. **Subjects and Methods:** The Short Form-36 QOL scale, Beck Depression Inventory and State-Trait Anxiety Inventory Form were used to evaluate the presence and degree of depression and anxiety and their association with sociodemographic features of 50 family caregivers of diabetic patients compared to 54 controls. **Results:** The groups were similar in terms of age, sex, health insurance, educational status and marital and financial status. Beck Depression Inventory scores were significantly higher in family caregivers ($p = 0.001$) than in controls. Depression as a categorical variable was significantly more frequent among family caregivers of diabetic patients than among controls ($p < 0.001$). The social function component of the QOL of controls was better than that of family caregivers ($p < 0.005$). There

was no difference between groups in terms of anxiety. **Conclusion:** Family caregivers of diabetic patients appeared to be more prone to depression and tended to have a poorer QOL.

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Introduction

Chronic diseases such as diabetes are commonly associated with depression and deterioration in quality of life (QOL) [1]. For example, in one study, examining the impact of depressive and chronic physical conditions such as diabetes on functional status and health care use, patients with chronic physical illness and comorbid depression had increased functional disability, used health-care services more frequently, and were absent from work more often than patients who had chronic physical illnesses without comorbid depression [2].

The association between diabetes and depression has been extensively analyzed [1, 3–5]. There are many controlled studies demonstrating the increased prevalence of

depression in patients with type 2 diabetes mellitus [1, 5]. The prevalence of depression in patients with diabetes ranges between 9 and 26% [1]. Recent studies also showed that depression may constitute a major risk factor in the development of type 2 diabetes mellitus and may accelerate the onset of diabetic complications [1, 5]. Diabetes can cause blindness, kidney failure and neuropathy as well as atherosclerosis that can lead to stroke or myocardial infarction, all ultimately associated with increased mortality [6] in addition to a poorer QOL [7, 8].

Factors affecting QOL in diabetic patients include depression, sexual dysfunction, comorbid medical conditions, complications of diabetes, and the quality of family relationships [7–10]. On a daily basis, patients must closely monitor and adjust their diets, test their blood glucose levels, take medication, and exercise. These tasks are largely done within the family setting, which directly and indirectly influences both the patients and their family members. Social support – assistance and protection given to others, especially to individuals – has been shown to improve disease management among adults with diabetes [11, 12].

The World Health Organization has stated that ‘health care for chronic conditions must be oriented around the patient and the family’ [13], given that chronic disease affects the QOL of both family caregivers and patients [14]. Unfortunately, few studies have assessed the QOL of family caregivers of diabetic patients [15–17]. Those that have examined this issue have clearly stated that clinicians should be aware of the caregivers’ position [15–17]. In this study, we aimed to assess the QOL among family caregivers of patients with type 2 diabetes versus controls, by evaluating their state of depression and anxiety and determining their association with sociodemographic features.

Subjects and Methods

Subjects

Family members of 50 patients with type 2 diabetes mellitus, of whom each had been followed for at least 6 months in our outpatient clinic, were recruited for the study. Patients were all adults. They were randomly chosen from the records of the endocrinology clinic by simple random sampling method and contacted by telephone for interviewing. Sixty-four caregivers were called: 5 of them did not answer and 9 did not accept to come to the hospital for the interview.

Inclusion criteria were: caregivers living in the same house with the patient, responsible for helping with treatment of the patient, being an adult, and having the ability to understand and answer the interview questions. Exclusion criteria were: any

chronic disease, any previously diagnosed mental illness, use of any psychiatric medication, or any physical disability that could prevent the subject from helping the patient.

Controls were chosen from among natives living in the same locale with no physical or mental illness. They were chosen from among healthy relatives of the hospital staff. Hospital staff were informed about the study and were encouraged to invite their healthy relatives to participate in the study. Controls were matched with test patients with regard to educational, socioeconomic, occupational and marital status.

Each participant was informed about the purpose of the study before the interview, and they had the right to refuse to participate and withdraw at any time. All participants signed an informed consent document to participate in the study, which was conducted with the approval of the Ethics Committee, Trabzon Numune Education and Research Hospital, Trabzon, Turkey. Questionnaires in Turkish language were administered face-to-face and completed in about 30–45 min by the same physician (İ.R.).

Methods

Short Form-36 QOL Questionnaire. The participant’s health status was evaluated by using the Short Form (SF)-36 questionnaire, Turkish version [18, 19]. It consists of 36 questions measuring 8 health concepts: physical function, role physical, bodily pain, general health, vitality, social function, role emotional, and mental health. The scoring was conducted upon a scale of 0–100, with higher scores reflecting better health status.

Beck Depression Inventory. The Beck Depression Inventory (BDI) is a reliable, easy-to-use screening instrument that has been applied worldwide in both psychiatric and non-psychiatric populations [20]. The Turkish version of the BDI was validated by Hisli [21], with a Cronbach α reliability of 0.8. It comprises 21 items to measure the severity of depressive symptoms. Each item is scored on a scale of 0–3, with total scores ranging from 0 to 63 (normal, 0–9; mild to moderate depression, 10–18; moderate to severe depression, 19–29; and severe depression, 30–63) [20].

State-Trait Anxiety Inventory Form. The State-Trait Anxiety Inventory (STAI) is a self-report measure that assesses trait (20 questions) and state of anxiety (20 questions). The temporary condition of ‘state anxiety’ (STAI-TX1) and the more general and longstanding quality of ‘trait anxiety’ (STAI-TX2) are clearly differentiated by assessing how respondents feel ‘right now’ and assessing anxiety proneness or how respondents ‘feel generally’ [22]. It has been validated for the Turkish population by Öner and Le Compte [23].

Statistical Analysis

The SPSS software (version 16.0, SPSS Inc., Chicago, Ill., USA) was used for statistical analyses. Data normality was assessed by the Kolmogorov-Smirnov test. Comparisons between groups were done with the Student *t* test for normally distributed data and with the Mann-Whitney *U* test for non-normally distributed data. Categorical variables were analyzed by the χ^2 test, and one-way ANOVA was used to evaluate the differences between the groups for continuous variables. Frequencies and percentages were used to summarize nominal data; standard deviations were used to summarize continuous data.

Table 1. Sociodemographic characteristics of the participants

	Family caregivers (n = 50)		Controls (n = 54)		p
	n	%	n	%	
Age group					0.998
18–29 years	10	20	10	18.5	
30–34 years	10	20	10	18.5	
35–39 years	3	6	3	5.6	
40–44 years	15	30	17	31.5	
45–49 years	12	24	14	25.6	
Sex, female	35	70	39	72.2	0.973
Married	39	78	43	79.6	1.000
Educational status					0.187
Primary school	19	38	12	22.2	
Secondary/high school	21	42	26	48.2	
University	10	20	16	29.6	
Occupational status					0.063
Housewife	20	40	14	25.9	
Officer	5	10	15	27.8	
Laborer/worker	6	12	11	20.4	
Self-employed	8	16	9	16.7	
Retired	2	4	2	3.7	
Unemployed	9	18	3	0.6	
Assurance					0.546
Social security institution	11	22.4	16	29.6	
Retirement fund	39	77.6	38	70.4	
Monthly income					0.070
YTL ≤500	3	6	0	0	
YTL 500–1,000	24	48	16	29.6	
YTL 1,000–1,500	7	14	14	25.9	
YTL 1,500–2,000	8	16	10	18.6	
YTL >2,000	8	16	14	25.9	

1 YTL (New Turkish Lira) = 0.54 USD.

Table 2. Distribution of QOL scores

	Family caregivers (n = 50)	Controls (n = 54)	p
SF-36			
Physical function	78.0 ± 21.0	84.4 ± 16.7	0.089
Role physical	63.0 ± 40.2	76.9 ± 32.5	0.088
Bodily pain	67.2 ± 24.0	71.8 ± 21.6	0.307
General health	54.4 ± 15.8	61.7 ± 23.7	0.067
Vitality	52.6 ± 16.4	57.4 ± 24.5	0.239
Social function	59.8 ± 23.3	76.4 ± 21.3	<0.005
Role emotional	56.7 ± 45.8	73.5 ± 36.8	0.069
Mental health	55.9 ± 11.3	60.9 ± 20.0	0.114
BDI	13.8 ± 9.9	7.8 ± 7.5	0.001
STAI-TX1	44.9 ± 4.5	45.2 ± 3.7	0.637
STAI-TX2	44.8 ± 5.7	44.6 ± 4.4	0.896

Values are expressed as means ± SDs.

Results

Sociodemographic characteristics of the participants are presented in table 1. The characteristics of the groups showed no significant differences. Of the 50 caregivers, 25 were daughters, 13 spouses and 12 sons.

The QOL scores were generally lower among caregivers compared with controls, but differences were not significant for components of the SF-36 except for social function (table 2). In contrast, BDI scores were significantly higher in family caregivers than in controls ($p = 0.001$). Depressive symptoms (BDI score ≥ 10) were present in 64% of caregivers versus only 27.8% of controls ($p < 0.001$). Values for STAI-TX1 and STAI-TX2 scores did not differ significantly between the two groups (table 2).

All SF-36 component scores, and the STAI-TX2 score, were significantly lower among women in the caregiver group except for role emotional (table 3). The physical function component score was lower among married (75 ± 22) than among single (86.6 ± 17.5) caregivers but the difference was of borderline significance ($p = 0.057$; table 3). Controls did not show any significant differences by sex, relationship type or employment situation. The single controls did have a significantly lower general health component score than the married controls (47.2 ± 28 vs. 65.4 ± 21.2 ; $p = 0.021$). Physical function, bodily pain, general health and vitality component scores were also significantly lower among unemployed caregivers (table 4). In addition, the social function and mental health component scores were significantly lower among daughter caregivers than among son or spouse caregivers, but not those for depression or anxiety (table 5). All but two of the component scores (role physical, role emotional) were significantly lower in subjects who had less than a secondary school education (table 6), but depression and anxiety scores did not differ significantly.

Discussion

Family caregivers had a greater risk of depression than controls, confirming and extending previous work in this area [15–17].

For SF-36, a specific indicator of QOL, no significant difference, except social function, was observed between caregivers and controls, although all scores were lower in caregivers than in controls. The BDI scores, which indicate depressive state, were significantly higher in caregivers than in controls. Equally important, the prevalence of depression (BDI score ≥ 10) was significantly higher

Table 3. QOL scores by sex and marital status

	Family caregivers (n = 50)			Family caregivers (n = 50)		
	females (n = 35)	males (n = 15)	p	married (n = 39)	single (n = 11)	p
SF-36						
Physical function	74.0 ± 22.5	87.3 ± 13.6	0.014	75.0 ± 2.2	88.6 ± 17.5	0.057
Role physical	54.3 ± 41.3	83.3 ± 29.4	0.019	61.5 ± 40.1	68.2 ± 41.9	0.554
Bodily pain	62.4 ± 23.8	78.5 ± 21.4	0.024	65.3 ± 22.5	78.5 ± 21.3	0.294
General health	51.2 ± 15.4	61.8 ± 14.5	0.028	53.2 ± 15.4	58.5 ± 17.2	0.329
Vitality	49.0 ± 15.4	61.0 ± 15.9	0.016	51.7 ± 15.4	55.9 ± 19.9	0.454
Social function	53.9 ± 22.6	73.3 ± 19.4	0.006	58.3 ± 22.8	64.8 ± 25.5	0.338
Role emotional	48.6 ± 46.7	75.6 ± 38.8	0.051	55.6 ± 46.1	60.6 ± 46.7	0.656
Mental health	52.5 ± 9.9	64.0 ± 10.5	0.001	55.1 ± 10.6	58.9 ± 13.8	0.327
BDI	15.4 ± 10.4	9.9 ± 6.3	0.06	14.7 ± 9.9	10.3 ± 8.4	0.179
STAI-TX1	45.6 ± 4.8	43.2 ± 3.2	0.087	45.1 ± 4.6	43.9 ± 4.1	0.433
STAI-TX2	45.8 ± 5.3	42.3 ± 5.9	0.041	44.8 ± 6.1	44.5 ± 4.3	0.842

Values are expressed as means ± SDs.

Table 4. QOL scores by employment status

	Family caregivers (n = 50)			Controls (n = 54)		
	employed (n = 19)	unemployed (n = 31)	p	employed (n = 35)	unemployed (n = 19)	p
SF-36						
Physical function	85.5 ± 15.4	73.4 ± 22.8	0.030	84.6 ± 18.6	83.9 ± 20.1	0.882
Role physical	75.0 ± 34.4	55.6 ± 42.2	0.084	91.4 ± 36.9	86.8 ± 19.3	0.298
Bodily pain	78.5 ± 21.4	60.3 ± 23.3	0.006	82.8 ± 22.6	69.9 ± 20	0.664
General health	62.2 ± 16.9	49.6 ± 13.2	0.005	68.6 ± 25.6	67.4 ± 18.9	0.195
Vitality	60.3 ± 14.7	47.9 ± 15.8	0.008	57.9 ± 22.4	56.6 ± 28.6	0.857
Social function	63.8 ± 22.0	57.3 ± 24.1	0.340	84.6 ± 21.3	79.6 ± 21.3	0.418
Role emotional	70.2 ± 42.9	48.4 ± 46.2	0.091	81.4 ± 40.5	77.2 ± 29.5	0.992
Mental health	59.2 ± 10.6	53.9 ± 11.4	0.114	62.7 ± 16.8	57.7 ± 25.1	0.380
BDI	13.3 ± 9.5	14.1 ± 9.9	0.780	7.9 ± 8.2	7.6 ± 6.4	0.886
STAI-TX1	44.5 ± 4.1	45.1 ± 4.8	0.685	45.7 ± 3.9	44.3 ± 2.9	0.177
STAI-TX2	44.5 ± 5.9	44.2 ± 5.6	0.784	45.5 ± 4.3	43.1 ± 4.3	0.061

Values are expressed as means ± SDs.

among caregivers compared to controls, as shown in previous studies [14, 24].

Similar to most studies [15, 25–27], the majority of caregivers in our study were women and spouses. Female caregivers, a daughter or spouse, generally had lower QOL and STAI scores, but higher BDI scores, as previously reported by Li et al. [28]. These indices are a reflection of the fact that in the traditional family setting such as in our country, women generally have more responsibility in taking care of the family including the sick, even

if working outside the home. Marital status did not appear to be significantly associated with QOL, depression or anxiety scores among caregivers because all scores for single caregivers were better than those for married caregivers, possibly because married people may have less time for themselves and more responsibilities.

In the caregiver group, those who were employed or had a higher education had a significantly better QOL than the unemployed and less educated. This may be because working outside home may have a protective effect

Table 5. QOL scores by type of caregiver relationship

	Daughter (n = 25)	Son (n = 13)	Spouse (n = 12)	p
SF-36				
Physical function	76.6 ± 22.9	88.1 ± 14.5	70.0 ± 20.1	0.087
Role physical	58.0 ± 38.7	84.6 ± 29.8	50.0 ± 46.5	0.064
Bodily pain	62.8 ± 25.5	79.2 ± 22.9	63.3 ± 18.7	0.110
General health	52.5 ± 13.6	61.5 ± 13.8	50.7 ± 20.3	0.158
Vitality	49.6 ± 15.2	59.2 ± 16.4	51.7 ± 18.0	0.226
Social function	54.5 ± 24.2	75.0 ± 19.8	54.2 ± 18.7	0.020
Role emotional	52.5 ± 9.9	71.8 ± 40.5	55.3 ± 11.7	0.388
Mental health	52.8 ± 9.4	63.1 ± 10.9	64.4 ± 12.3	0.020
BDI	14.5 ± 10.2	9.8 ± 6.8	16.5 ± 10.6	0.202
STAI-TX1	44.9 ± 4.5	43.2 ± 3.2	46.7 ± 5.3	0.149
STAI-TX2	46.2 ± 4.9	42.7 ± 5.5	43.9 ± 6.8	0.160

Values are expressed as means ± SDs.

Table 6. QOL scores by education status

	Illiterate/pri- mary school (n = 19)	Secondary/ high school (n = 21)	University (n = 10)	p
SF-36				
Physical function	66.8 ± 22.5	81.2 ± 18.9	92.5 ± 8.9	0.003
Role physical	48.7 ± 44.5	70.2 ± 35.0	75.0 ± 37.3	0.136
Bodily pain	57.4 ± 21.9	67.3 ± 24.3	85.7 ± 17.1	0.008
General health	47.0 ± 14.0	53.3 ± 12.1	70.7 ± 15	<0.005
Vitality	44.7 ± 12.1	51.9 ± 16.9	69.0 ± 9.9	<0.005
Social function	53.9 ± 22.8	54.8 ± 21.8	81.3 ± 14.7	0.003
Role emotional	43.9 ± 47.2	58.7 ± 44.6	76.7 ± 41.7	0.197
Mental health	52.8 ± 9.4	54.7 ± 10.9	64.4 ± 12.3	0.023
BDI	14.4 ± 8.0	14.9 ± 10.9	10.1 ± 9.8	0.410
STAI-TX1	45.0 ± 4.9	45.0 ± 4.8	44.2 ± 3.0	0.878
STAI-TX2	45.1 ± 6.4	44.6 ± 6.1	44.5 ± 3.1	0.878

Values are expressed as means ± SDs.

on the caregivers. Caregivers with a higher income also had better scores (data not shown). Many other studies have noted a similar association between educational status and income [14, 15, 25].

In our study, it has been clearly shown that caregivers of patients with type 2 diabetes mellitus were depressed, but not anxious, and although all scores favored controls, the QOL of caregivers is not impaired statistically except for social function. SF-36 asks how subjects felt during the past 4 weeks and the status during this period. Higher or lower scores may be affected by events having occurred during this time. We hope this will be evaluated in future studies.

Our study has two main limitations. First, we did not assess the effect of diabetes complications on the caregiv-

ers' QOL or depressive state. Second, the present study was performed cross-sectionally in a relatively small group from a single center. Therefore, our findings may not represent those of a broader population.

In conclusion, diabetes mellitus affected the QOL of the family caregivers, and caregivers of patients with type 2 diabetes tended to be more depressed.

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