

Quality of life and sleep in diabetes mellitus patients

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Abstract

Aim: As in other chronic diseases, symptom and signs of psychiatric disorders are more common in patients with diabetes mellitus (DM) than in the general population. The aim of this study was to evaluate the quality of life and sleep in DM patients.

Material and Methods: A total of 100 DM patients, 56 (56%) female and 44 (44%) male, were included in the study. Control group consisted of 100 healthy volunteers (53 females (53%) and 47 males (47%)). The sociodemographic and clinical characteristics of participants were recorded. Patients were asked to complete the 36-Item Short-Form Health Survey (SF-36) and Pittsburgh Sleep Quality Questionnaire (PSQ). Score calculations were made according to the survey results. Data were analyzed using SPSS 14 program.

Results: A statistically significant difference was found between the patient and control group in all sub-parameters of quality of life ($p < 0.05$). When the mean of all sub-parameters was evaluated, it was detected that all quality of life scores of the patients were lower than the control group. PSQ subscale scores were significantly different between patient and control groups ($p < 0.001$). The total PSQ score of the patients was 9.14 ± 4.07 and the control group was 5.38 ± 3.30 .

Conclusion: According to our study results, impaired quality of life and sleep observed in DM patients. We think that the evaluation of sociodemographic variables that may affect the quality of life and sleep quality and accordingly planning the treatment strategy would have positive contributions in the treatment of DM.

Keywords: Diabetes mellitus; quality of life; SF-36; quality of sleep

INTRODUCTION

DM is a metabolic disease characterized by hyperglycemia resulting from disorders of insulin secretion, insulin action, or both. Chronic hyperglycemia cause long-term damage and eventually failure of organs, especially at the eyes, kidneys, heart, and blood vessels. (1). Preventing these complications will not only reduce the economic burden of health care system but also will improve the patient's quality of life (2). DM can also lead to mental, emotional, social, and psychosexual problems. It may cause psychiatric disorders by affecting brain functions and also depending on disease perception. This condition that can be seen in the course of DM, may affect the severity and progression of the disease. Therefore, it is important to treat patients with diabetes in a holistic approach. Compared to the general population, patients with diabetes have a high rate of psychiatric symptoms and illness as in other chronic diseases (3).

Quality of life is the most important goal of health interventions and is measured by physical and social functioning perceived as physical and mental (4). It is known that deterioration can be seen in the quality of life of patients with a variety of chronic diseases. Dietary requirements, daily drug use, and disease-related complications may adversely affect quality of life (5). Therefore, measuring the quality of life is important in assessing the impact of disease and monitoring treatment results (6). Quality of life includes physical, mental and social well-being of the patient. The importance of achieving and maintaining a good quality of life is increasingly recognized and emphasized in the diabetes guidelines. It therefore represents an important goal for health care in itself (7).

In society, chronic sleep disorder and poor sleep quality are very common. Poor sleep quality or sleep disturbance increases the risk of developing type 2 DM as well as its negative impact on morbidity and mortality (8). Sleep disturbance due to problems in blood

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sugar regulation increases the risk of cardiovascular death of DM (9). The aim of this study was to evaluate the quality of life and sleep in DM patients.

MATERIAL and METHODS

The study was conducted after the approval of the local ethics committee (decision date:02/15/2012, number:2012-224). Participants were selected from DM patients and healthy volunteers who applied to the Internal Medicine Outpatient Clinic of Cumhuriyet University School of Medicine. The study was designed as a prospective cross-sectional study. 100 subjects were included in both groups. Participants were compared in terms of age, gender, marital status, income level, business and education. All participants were asked to complete the SF-36 and PSQ questionnaire. Those under the age of 18 and those who refused to fill out the questionnaire were excluded from the study. The control group was selected from age and sex-matched healthy volunteers who have not any disease.

SF-36 scoring includes 36 questions and provides the evaluation of 8 dimensions. The scale gives the score for each subscale, instead of only a single total score. (10). The subscales assess health from 0 to 100 and 0 indicates poor health, while 100 indicates good health.

SF-36 Components:

- 1.physical function, (10 items),
- 2.social functioning, (2 items)
- 3.physical role function, (4 items)
- 4.emotional role function, (3 items)
- 5.mental health, (5 items)
- 6.wellness/fatigue, (4 items)
- 7.pain, and (2 items)
- 8.general health perception, (5 items)

PSQ consists of 24 questions and 7 components. 19 of them are self-evaluation questions, 5 of them are answered by partner or roommate. Each component is evaluated with scores between 0-3. The total score of the scale is between 0-21. The total PSQ score of 5 or higher indicates poor sleep quality (11).

PSQ components:

- 1.subjective sleep quality,
- 2.sleep latency,
- 3.sleep duration,
- 4.usual sleep activity,
- 5.sleep disturbance,
- 6.use of sleep medication, and
- 7.daytime dysfunction

Statistical Analysis

Data were analyzed by using the Statistical Package for the Social Sciences (SPSS) 14.0 program. The categorical data obtained in the groups were given as absolute numbers and the numerical data as mean \pm standard deviation.

P<0.05 was considered significant. Chi-square test was used to evaluate differences in socio-demographic characteristics and Student's t test was used to evaluate differences between groups. Pearson correlation test was used to compare some parameters between the groups.

RESULTS

The study group consisted of 100 patients, of which 56 (%56) were females and 44 (44%) were males. The control group was selected among healthy volunteers including 53 (53%) female and 47 (47%) male. The mean age of the control group was 43 ± 8.9 and the mean age of the patient group was 45.6 ± 10.7 . There was no statistically significant difference between the patients and controls in terms of gender, age, income and marital status ($p > 0.05$). The sociodemographic characteristics of the patient and control groups and the statistical relationship between these characteristics are given in Table 1.

Table 1. Sociodemographic characteristics of the patients and controls

		DM (n=100 N (%)	Control (n=100) N (%)	P value
Gender	Male	47	47	0.670
	Female	56	53	
Marital status	Single	13	24	0.059
	Married	79	74	
Income status	Widow	8	2	0.090
	Low	36	29	
	Medium	54	50	
Education level	High	10	21	0.025 *
	Not literate	5	0	
	Elementary school	35	22	
	Middle school	18	28	
	High school	26	28	
	University	16	22	
	Housewife	35	18	
Job	Civil servant	14	22	0.041*
	Worker	24	19	
	Unemployed	1	1	
	Self-employment	3	10	
	Farmer	3	2	
	Other	20	28	

* p <0.05 significant

When the quality of life subscale scores were compared between the patient and control groups, a statistically significant difference was found in each parameter (p : 0.036 for wellness/fatigue subscale, $p < 0.001$ for all other scales). The mean score of all quality of life sub-parameters was lower in the patients than in the controls. The scores of the quality of life sub-components of the patient and control groups are shown in Table 2.

Table 2. Comparison of quality of life subscale scores of patients and controls

Physical function	Patient	53.81±31.17	p<0.001* t=9.23
	Control	86.04±15.70	
Social function	Patient	61.05±23.24	p<0.001* t=4.76
	Control	75.90±20.79	
Physical role function	Patient	44.55±41.63	p<0.001* t=8.18
	Control	86.25±29.38	
Pain	Patient	57.10±26.58	p<0.001* t=5.53
	Control	75.03±18.83	
Mental health	Patient	51.30±23.54	p<0.001* t=3.39
	Control	61.20±17.23	
Emotional role function	Patient	52.30±39.17	p<0.001* t=4.58
	Control	76.81±37.01	
Wellness/fatigue	Patient	47.65±8.60	p:0.036* t=2.10
	Control	50.11±7.90	
General health perception	Patient	1.37±0.96	p<0.001* t:5.97
	Control	0.81±0.96	

* p <0.05 significant

PSQ subscale scores were compared between the two groups and the difference was found to be statistically significant (p:0.021 for sleep time subscale, p <0.001 for other scales). The total PSQ score of the patient group was 9.14±4.07 and the control group was 5.38±3.30 (p<0.001). The scores of the sleep quality sub-components are shown in Table 3.

Table 3. Comparison of PSQ subscale scores of patients and controls

	Group	Mean±SD	P value and t
Subjective sleep quality	Patient	1.47±0.82	p<0.001* t:4.55
	Control	0.99±0.66	
Sleep latency	Patient	1.54±0.85	p<0.001* t:4.47
	Control	0.99±0.88	
Sleep duration	Patient	1.29±1.16	P :0.021* t:2.32
	Control	0.93±1.07	
Usual sleep activity	Patient	1.06±1.14	p<0.001* t:5.49
	Control	0.32±0.70	
Sleep disturbance	Patient	1.74±0.66	p<0.001* 5.38
	Control	1.24±0.65	
Use of sleep medication	Patient	0.66±1.01	p<0.001* t:5.14
	Control	0.10±0.38	
Total PSQ	Patient	9,14±4,07	p<0.001* t:7,14
	Control	5,38±3,30	

* p <0.05 significant

DISCUSSION

The economic status of the patients included in this study was 36 (36%) low income, 54 (54%) middle income and 10 (10%) high income. The study conducted by Güven

(12) reported that 17.5% of the participant's economic status was poor, 59.8% was moderate and 22.7% was good. Connell et al. (13) reported that patients with better socioeconomic status had better compliance with treatment and quality of life was directly affected by economic status. 35% of the diabetic individuals who participated in our study were housewife, 24% were worker, 14% were civil servants and 20% consisted of others that covered mostly retired people. Likewise, studies examining the similar topics reported that diabetes is common among housewives and retired individuals. (14). This may be due to the fact that the majority of people with diabetes are women. In addition, the fact that women in our country do not play an active role in working life yet may explain why the majority of women are housewives. In addition, the high retirement rate can be attributed to the fact that diabetes is mostly seen in middle age and older.

According to the results of our study, when the quality of life scores were compared between patients and controls, all sub-parameters of quality of life were found to be lower in the patient group compared to the control group. The highest score obtained from the patient group was the social function subscale; the lowest score was the physical role function subscale. The control group obtained the highest score from the physical role function and the lowest score from the general health subscale. Graham et al. (15) reported that the highest score obtained by DM patients was from the general health dimension and the lowest score was the physical functionality dimension. However non-diabetic patients obtained the highest score from the social functioning dimension and the lowest score from the general health dimension. In addition, the calculated sub-dimension scores of diabetic individuals (between 51 and 80) were higher in both our own study (between 45 and 61) and in similar studies conducted previously.

The total PSQ score of the patient group was 9.14±4.07 and was 5.38 ± 3.30 at control. Although sleep need varies from person to person, sleep quality is adversely affected by many factors, particularly in chronic diseases. Sleep, which is necessary for regeneration of metabolism, is impaired in patients with diabetes due to impaired glucose metabolism. In studies conducted on this subject reported that sleep quality is impaired in diabetes. Cunca et al. (16) found that sleep quality was impaired in 48% of patients with Type 2 DM. In the study of Güneş et al. (17) found that there was a significant relationship between diabetes and sleep quality and reported impaired sleep quality of diabetic patients. Jin et al. (18) evaluated the sleep quality of 130 patients with type 2 DM and calculated the total PDQ score of more than 5 in 78 patients, indicating that this reflects poor sleep quality. In addition, parameters such as hemoglobin A1C, hypertension, hs-CRP and diabetes duration were found to be higher in patients with poor sleep quality. In a study evaluating the quality of life and sleep in patients with type 2 DM, poor sleep quality

was detected in 55% of patients and it was stated that sleep disturbance may impair quality of life (19).

CONCLUSION

According to our study results, impaired quality of life and sleep in DM patients has been detected. We think that the evaluation of sociodemographic variables that may affect the quality of life and sleep in individuals with DM would have positive contributions to the treatment of DM.

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REFERENCES

1. İliçin G, Biberöğlü K, Süleymanlar G, ve ark. İç Hastalıkları. 3. Baskı. Güneş Kitabevi, İstanbul 2012:2078-92.
2. Onalan E, Gozel N, Yakar B. An evaluation of type 2 diabetes mellitus patients on different oral antidiabetic medications with regard to glycemic control and diabetic complications. Medical Science and Discovery 2019;6:180-5.
3. Özdemir İ, Hocaoglu Ç, Koçak M, et al. Tip 2 diyabetes mellituslu hastalarda yaşam kalitesi ve ruhsal belirtiler. Dusunen Adam The J Psychiatry and Neurological Sci 2011;24:128-38.
4. Rubin RR, Peyrot M. Quality of Life and Diabetes. Diabetes Metab Res Rev 1999;15:205-18.
5. Baraz S, Zarea K, Shahbazian HB. Impact of the self-care education program on quality of life in patients with type II diabetes. Diabetes Metab Syndr 2017;11:1065-8.
6. Ojelabi AO, Graham Y, Haighton C, et al. A systematic review of the application of Wilson and Cleary health-related quality of life model in chronic diseases. Health Qual Life Outcomes 2017;15:241.
7. Adriaanse MC, Drewes HW, van der Heide I, et al. The impact of comorbid chronic conditions on quality of life in type 2 diabetes patients. Qual Life Res 2016; 25:175-82.
8. Lou P, Zhang P, Zhang L, et al. Effects of sleep duration and sleep quality on prevalence of type 2 diabetes mellitus: a 5-year follow-up study in China. Diabetes Res Clin Pract 2015;109:178-84.
9. Hayashino Y, Fukuhara S, Suzukamo Y, et al. Relation between sleep quality and quantity, quality of life, and risk of developing diabetes in healthy workers in Japan: the high-risk and population strategy for occupational health promotion (HIPOP-OHP) study. BMC Public Health 2007;28:129.
10. Carr AJ, Thompson PW, Kirwan JR. Quality of life measures. Br J Rheumatol 1996;35:275-81.
11. Timur S, Şahin NH. Menopoz ve uyku. Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi 2010;3:61-7.
12. Güven N. Diabetes mellituslu hastalarda yorgunluk ve yaşam kalitesinin değerlendirilmesi. Yüksek Lisans Tezi, Haliç Üniversitesi, İstanbul, 2010.
13. Çıtlı R. Diyabetik hastalarda tıbbi ve sosyal faktörlerin yaşam kalitesine etkisi. Tıpta Uzmanlık Tezi, Erciyes Üniversitesi, Kayseri, 2009.
14. Connel CM, Dawis WK, Gallant MP, et al. Impact of social support, social cognitive variables, and perceived threat on depression among adults with diabetes. Health Psychol 1994;13:263-73.
15. Graham JE, Stoeberl-May DG, Ostir GV, et al. Health related quality of life in older Mexican Americans with diabetes: a cross-sectional study. Health Qual Life Outcomes 2007;12:39-46.
16. Cunca MC, Zanetti ML, Hass VJ. Sleep quality in type 2 diabetics. Rev Lat Am Enfermagem 2008;16:850-5.
17. Güneş Z, Körukücü Ö, Özdemir G. Diyabetli hastalarda uyku kalitesinin belirlenmesi. Atatürk Üniversitesi Hemşirelik Yüksekokulu Dergisi 2009;12:10-7.
18. Jin QH, Chen HH, Yu HL, et al. The relationship between sleep quality and glucose level, diabetic complications in elderly type 2 diabetes mellitus. Zhonghua Nei Ke Za Zhi 2012;51:357-61.
19. Luyster FS, Dunbar-jacob J. Sleep quality and quality of life in adults with type 2 diabetes. Diabetes Educ 2011;37:347-55.