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INVESTIGATING THE RELATIONSHIP BETWEEN SELF-CARE AND SLEEP QUALITY IN PATIENTS WITH TYPE-II DIABETES

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Abstract:

Introduction and Objective: Self-care and sleep are essential factors for improving quality of life and reducing the complications of the disease in diabetic patients. The aim of this study was to determine the relationship between self-care behaviors and sleep quality in diabetic patients referring to Zabol Diabetic Clinic in 2017.

Method: The present study was a descriptive-analytic research. 80 patients who referred to Zabol Clinic of Diabetes were selected by census. Then, data were collected using some questionnaires including demographic information, summary of self-care behaviors and Pittsburgh sleep quality .collected data were analyzed using SPSS-23 software and descriptive statistical tests, independent t-test and Spearman correlation.

Results: The level of self-care behaviors in 52.1% of patients was reported as semi-desirable while it was reported to be poor in 16.5% of them. Sleep quality was conveyed in 96.3% of patients in the semi-desirable state and it was reported to be well in 3.8% of them. Reverse relationship and significant statistical difference was shown by Spearman correlation coefficient between the score of self-care behaviors and sleep quality scores ($r = -0.4$, $p = 0.000$).

Conclusion: The results of this study indicated that patients who gained a higher score in sleep quality, were at a lower level in terms of self-care behaviors. Training in the field of Self-care behaviors is recommended to improve the quality of sleep in diabetic patients.

Keywords: *Self-care, Sleep quality, Diabetic patients*

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INTRODUCTION:

Diabetes is one of the main causes of death and it is one of the factors affecting the health system which is caused by an insulin secretion disorder characterized by resistance to insulin. The prevalence of diabetes was estimated more than 285 million people over the age of 21 years by 2010. It is anticipated this rate will increase in 2030 up to 439 million people (1, 2).

The prevalence of diabetes in Iran was reported to be about four million individuals by 2008 and that will triple over the next 15 years based on prediction of experts (3). There are complications in the person in the absence of controlling diabetes such as neuropathy, vascular problems, kidney disease, visual impairment, end-of-life loss, loss of extremities and increase in economic problems (4).

The most important factor in controlling diabetes is done by the individual with self-care behaviors which leads to better effect on treatment outcomes (5). For the first time, the concept of self-care was raised by Orem who was the theorist of nursing in 1950 (6).Self-care in diabetic patients encompasses a wide range of self-care behaviors such as monitoring and controlling blood glucose levels, insulin therapy, and taking oral anti-diabetes pills, exercise and physical activities, nutrition, foot care and other health behaviors (7).

Although the ultimate goal in carrying out self-care behaviors in patients is maintaining normal blood glucose levels and subsequently improving the quality of life of the patient and their family members and success in this domain also leads to a reduction in medical costs (8, 9),any shortcoming in self-care behaviors causes some complications and increased mortality in these patients (5).

Among the complications, it can be referred to a disorder in sleep quality of patients which occurs as a result of factors such as the modernization of life, hypoglycemia and frequent urination during sleep (10).The results of the research indicate that sleep problems in diabetic patients are more prevalent than normal people .such problems decrease glucose tolerance and insulin sensitivity (11) which lead to exacerbation of the disease, disruption of treatment and increased complications of the illness and social disability (12). Also, increase or decrease in rate of sleep is associated with the risk of developing diabetes or its inadequate control, so that the results of various studies have shown that patients with impairment in sleep quality act poorly in adherence to the proper control of blood glucose (13, 14).

While self-care behaviors aim to maintain the level of glucose at the normal level and subsequently reduce the negative complications caused by its poor control, the prevalence of sleep disorders in diabetic patients affects different aspects of self-care including increasing problems in controlling diabetes, decline in rate of self-confidence in performing self-care behaviors and reducing self-management behaviors in patients (15). Regarding the importance of the issue and the lack of study in examining the relationship between self-care behaviors and sleep quality in diabetic patients, the aim of this study was to determine the mentioned association in diabetic patients referring to Zabol Diabetic Clinic in 2017.

MATERIALS AND METHODS:

The present research is a descriptive-analytic study which was carried out with the aim of determining the relationship between self-care behaviors and sleep quality in diabetic patients referring to the Zabol Diabetic Clinic in 2017 in which 81 patients with diabetes based on the objective of the research were entered the study according to the census. In other hand the sampling method was convenience. The inclusion criteria were as below:

A diabetic individual being confirmed by an endocrinologist, passing at least two years since the occurrence of disease, Ability to communicate, willingness to participate in research.
Exclusion criteria were as follows:

Patients who were not able to understand the questions and those who expressed dissatisfaction with the study.To collect information, demographic information questionnaires (age, sex, marriage status, education, economic status, duration of having diabetes, any underlying illness) and self-care behaviors questionnaire in diabetic patients as well as Pittsburgh sleep quality questionnaire were used.

Questionnaire of Self-care behaviors in diabetic patients has 15 questions which examines the areas of the diet, physical activity, blood glucose test, foot care and medication use.

Each question is scored between 0 to 7 and the total score of the questionnaire is between 0 to 105. The obtained scores are divided into three parts including the desired level (65-105), the half-desirable (30-60) and undesirable (0-30).

There are eight questions about nutritional behavior and the scoring range is between 0 to 56.one question is devoted to physical activity and one question is

about controlling blood glucose. The scoring range for each dimension is placed between 0 to 7.The other part measures the footcare which includes three questions and the range of scores in this section is between 0 to 2. Ultimately, the degree of medication compliance is determined by two questions and the scoring range in this division is between 0 to 14. The reliability of the mentioned questionnaire was calculated in Ahmadi et al. (2016) ($\alpha = 0.88$) (5).

Questionnaire of Pittsburgh Sleep Quality is one of the most important questionnaires available to assess the patient's sleep quality during their recent month. Pittsburgh sleep quality questionnaire consists of seven scores for scales 1.
1. the individual's Understanding from their quality of sleep ,2. Sleep latency, 3. Real sleep duration, 4. Real sleep efficacy, 5.Factorsdisturbing sleep (Sleep disturbance), 6.Consumption dosage of sleep medication, 7. Daytime dysfunction of an individual. It also yields overall score. Scoring of 0,1,2,3 per scale represents being normal, the presence of a mild, moderate and severe problem, respectively. Earning score 5 and above means poor sleep quality (16). Farahi et al. (2009) obtained a 100% of sensitivity, specificity of 89% as well as Kronbach's alpha for Persian translation (17).

To complete the questionnaires, self-report method was used. in cases where the patient could not read and write, the questionnaire was completed by the researcher in an interview form. During the completion of the questionnaires, patients were assured that their information will remain confidential. For data analysis, SPSS version 23.0 and descriptive- statistical tests were implemented. Pearson test was also used to examine the relationship between variables.

RESULTS:
43.8% of the participants were female while 56.3% of the them were men. Among all the participants, 13.8% of them were single and 86.3% of them were married.

Educational level of applicants included 58.8% with elementary school level, 20% with middle school education, 20% with diploma and 1.3% with higher levels of education. In terms of job status,20% of participants were unemployed, 26.3% of them were Self-employed. Moreover,47.5% of the candidates were housewives while 6.3% of them were employees.45% of the cases had no underlying illness while 55% of them had an underlying disease in their history.46.3% of the participants did not have a history of diabetes while 53.7% of them reported a person with diabetes in history of their families. The mean rate of being diagnosed with diabetes in the subjects was 6.83.

The mean and standard deviations of data related to self-care behaviors were 52.11 and 20.79, respectively. In terms of self-care behaviors, data analysis indicated that 51.3% of patients were placed at the semi-desirable level, 32.5% of them were in favorable condition and 16.5% of them were at poor level. Other information on sub-scales of self-care behaviors is given in Table 1.

Table 1: Mean and standard deviation of sub-scales of self-care behaviors

variable		Mean ± standard deviation
self-care behaviors	Nutrition dimension	28.65±11.82
	dimension of physical activities	3.83 ±1.91
	dimension of Blood glucose control	4.47±1.82
	Foot care dimension	7.96±4
	dimension of pharmaceutical Compliance	8.77±5.55

Also, a significant difference was observed between the two sexes in terms of total score of self-care behaviors by independent t test (p = 0.01) so that men were positioned at a higher level than women based on self-care behaviors.

The mean and standard deviations of data associated with sleep quality were 11.57 and 4.03, respectively. Data analysis revealed that 96.3% of patients had undesired sleep quality and 3.8% of them had optimal sleep quality.
Other information about sleep quality subscales is given in Table 2.

Table 2: Mean and standard deviation of sleep quality sub-scales

Variable		Mean ± standard deviation
sleep quality	Mental quality from the individual's perspective	1.27±1.23
	Delays in falling asleep	1.97±0.95
	Useful Sleep Duration	1.6±1.23
	Sufficient sleep	1.5±1.1
	The amount of taking sleep medication	51.75±1.5
	Sleep disorder	1.95±0.87
	Morning performance	1.52±1.21

A statistically significant difference was observed between gender and total sleep quality score according to the independent T-test so that women gained more scores resulting in a lower quality of sleep.

An inverse and significant correlation between the total score of self-care behaviors and the quality of sleep in diabetic patients was indicated by Spearman correlation coefficients (p = 0.000, r = -0.4).Also, a significant relationship was indicated between the components of self-care behaviors and many components of sleep quality by Spearman correlation coefficient (Table 3).

Table 3: Correlation between self-care and sleep quality sub-scales

self-care / sleep quality	Nutrition	physical activity	Blood glucose control	Foot care	Pharmaceutical Compliance	Total self-care score
Mental quality from the perspective of an individual	r =0.18 p=0.09	r =0.15 p=0.17	r = -0.11 p= 0.33	r = 0. 2 p=0.06	r = -0.06 p= 0.56	r =0.33 p=0.000
Delays in falling asleep	r = -0.23 p=0.07	r =-0.2 p=0.07	r =0.15 p=0.18	r =0.11 p=0.29	r = -0.2 p=0.07	r =-0.04 p=0.67
Duration of Useful Sleep	r =-0.52 p=0.000	r = -0.3 p=0.007	r = -0.48 p= 0.000	r =-0.07 p=0.5	r =-0.34 p=0.002	r =-0.59 p=0.000
Sufficiency of sleeping	r = -0.19 p=0.08	r =-0.15 p=0.16	r =-0.14 p=0.31	r =-0.02 p=0.8	r =-0.03 p=0.7	r =-0.15 p=0.18
The amount of taking sleep medication	r = -0.44 p= 0.000	r = -0.21 p=0.06	r =-0.06 p=0.55	r =0.03 p=0.75	r = -0.5 p=0.000	r =-0.35 p=0.001
sleep disorder	r =-0.55 p=0.000	r =-0.27 p=0.01	r =-0.2 p=0.07	r =-0.1 p=0.36	r =-0.38 p=0.000	r =-0.48 p=0.000
Morning performance	r =-0.24 p=0.02	r =-0.13 p=0.24	r =0.01 p=0.93	r =0.12 p=0.26	r =-0.5 p=0.000	r = -0.06 p=0.55
Total sleep quality score	r = -0.59 p=0.000	r = -0.31 p=0.004	r = -0.23 p=0.03	r =-0.05 p=0.6	r =-0.61 p=0.000	r = -0.4 p= 0.000

DISCUSSION AND CONCLUSION:

The aim of this study was to determine the relationship between self-care behaviors and sleep quality in diabetic patients referring to Zabol Diabetes Clinic in 2017. The results of the data analysis showed that most patients are in semi-desirable and weak levels in terms of self-care behaviors.

The outcomes of the research carried out by Parham et al. indicated that 46.53% of patients are in moderate level based on self-care behaviors (18). Also, according to studies done by Jordan et al. as well as Anbari et al., in which self-care behaviors in diabetic patients were examined, the level of self-care behaviors in such patients was reported as moderate, which is consistent with the results of the present study (19, 20). A significant difference between sex and self-care behaviors was also observed in these patients, which indicated an increase in the level of self-care behaviors in men compared to women.

The results of the study performed by Firooz et al. revealed thatthere is a statistically significant difference between gender and self-care capacity of patients. Furthermore, men have higher rate of self-care behaviors than women which is in agreement with the results of this study (8).

But it was indicated in studies carried out by Karkazloo et al. as well as Parham et al., that level of self-care behaviors among women was higher than that of men which is not consistent with the outcomes of the present study (18, 21). This variance can be due to cultural differences as well as level of knowledge and education resulted from the present study samples.

In terms of sleep quality, analysis of data on the quality of sleep in diabetic patients showed that the majority of them are at a low level. In a study by Hemmati et al. to assess the quality of sleep in diabetic and non-diabetic patients, the results represented an increase in sleep problems in diabetic patients (22).The results of a review study also revealed that the prevalence of sleep disorders increases with the onset of diabetes and poor blood glucose control (self-care) (14).According to the results of Tsai's research, in which the relationship between sleep quality and blood sugar levels was examined, a significant difference was shown between glucose levels and low sleep quality as well as inadequate sleep in patients and this is consistent with the outcomes of this study (23) as one of the self-care goals for diabetics is maintaining blood glucose at the normal level and subsequently improving the quality of sleep in these patients. Furthermore, according to the results from the mentioned study, significant and inverse statistical difference was indicated between self-care scores and sleep quality of these patients. Moreover, there was an increase in the quality of sleep by reducing self-care behaviors and this represented arise in sleep quality impairment in patients.

The results of study conducted by Sadeghi et al. also revealed that impairment of diabetes control leads to increased problems and impairment in sleep quality so that over 95.8% of patients with uncontrolled diabetes had poor sleep quality which is consistent with the results of the current study (24).

Based on the results of Ohkuma et al. about investigating sleeping time on blood glucose level, it was shown that the duration of sleep has a reverse and significant correlation with A1c hemoglobin level, so that disorder in duration of sleep disturbance presented a poor adherence to blood glucose control in these patients (25).In this study, there was a significant and reverse difference between sleeping time and control of blood glucose which is in agreement with the results of this study. The results of the study carried out by Chasens also revealed that impairment in sleep quality has a negative effect on self-management behaviors in the mentioned patients. As self-management is one of the aspects of self-care in patients, it is consistent with the results of present study (15).The results of the current study presented that, self-care in diabetic patients is important in preventing complications caused by the disease. This requires more attention to be paid toward this issue in order to plan educational training so that the complications of reduction in doing self-care behaviors can be declined.

REFERENCES:
1.Co MA, Tan LSM, Tai ES, Griva K, Amir M, Chong KJ, et al. Factors associated with psychological distress, behavioral impact and health-related quality of life among patients with type 2 diabetes mellitus. Journal of Diabetes and Its Complications. 2015.
2.Baliga BS, Fonseca V. Recent advances in the treatment of type II diabetes mellitus. American family physician. 1997;55(3):817-24.

3.Rezasefat Balesbaneh A, Mirhaghjou SN, JafsriAsl M, Kohmanaee S, Kazemnejad Leili E, Monfared A. Correlation between self-care and self-efficacy in adolescents with type 1 diabetes. JafsriAsl M3. 2013;24(72):18-24.

4.Luyster FS, Dunbar-Jacob J. Sleep Quality and Quality of Life in Adults With Type 2 Diabetes. The Diabetes EDUCATOR. 2011;37(3):347-55.

5.Ahmadi Z, Sadeghi T, Loripoor M. the effect of peer education self-care behaviors among diabetic patients. Iranian journal of Diabetes and Metabolism. 2016;15(6):382-91.

6.White ML. Spirituality Self-Care Practices as a Mediator between Quality of Life and Depression . Religions. 2016;7(5):54-64.

7.Shahbaz a, Hemmati maslakpak m, Nejadrahim r, Khalkhali h. The Effect of Implementing Orem\'s-self care Program on Self-Care Behaviors in Patients with Diabetic Foot ulcer. Journal of Urmia Nursing And Midwifery Faculty. 2.17-108:(2)14;016

8.Mazlom SR, Firooz M, hoseini Sj, Hasanzade F, Kimiaie SA. Self-care of patient with diabetes type II. Journal of Sabzevar University of Medical Sciences. 2016;22(6):1018-25.

9.Shayeghian Z, Aguilar-Vafaie M, Besharat M, Amiri P, Parvin M, Roohi Gillani K. The Association between Self-Care and Control of Blood Sugar and Health-related Quality of Life in Type IIDiabetes Patients. Iranian Journal of Endocrinology and Metabolism. 2014;15(6):545-51.

10.Shahdadi H, Allah-yari J, MansouriA .Effect of Acupressure on Sleep Quality in Patients with Diabetes Mellitus. J Diabetes Nurs. 2017;5(2):78-85.

11.Van Dijk M, Donga E, J.G vD, Lammers GJ, van Kralingen KW, Dekkers OM, et al. Disturbed subjective sleep characteristics in adult patients with long-standing type 1 diabetes mellitus. Diabetologia. 2011;54:1967–76.

12.Associations of impaired sleep quality, insomnia, and sleepiness with epilepsy: A questionnaire-based case–control study.

13.Knutson KL, Ryden AM, Mander BA, etal. Role of sleep duration and quality in the risk and severity of type 2 diabetes mellitus. Archives of internal medicine. 2006;166(16):1768-74.

14.Hedayati A, pouresmail A, Gholampour Y, Dehghan A. The relation between sleep disorders and Hemoglobin A1c levels in patients with type II diabetes mellitus. Medical Journal of Mashhad University of Medical Sciences. 2016;59(3):179-87

15.Chasens E, Korytkowski M, Sereika S, Burke L. Effect of Poor Sleep Quality and Excessive Daytime Sleepiness on Factors Associated With Diabetes Self-Management The Diabetes EDUCATOR. 2013;39(1):74-82.

16.Mohammadi-Farrokhran E, Mokhayeri Y, Tavakkol Z, Mansouri A. Relationship between quality of sleep and mental health among students living in dormitories. Journal of knowledge & Health . .7-112:(3)7;2012

17.Farrahi J, Nakhaee N, Sheibani V, Garrusi B, Amirkafi A. Psychometric properties of the Persian version of the Pittsburgh Sleep Quality Index addendum for PTSD (PSQI-A). Sleep and Breathing. 2009;13(3):259-62.

18.Parham M, Riahin AA ,Jandaghi M, Darivandpour A. Self Care Behaviors of Diabetic Patients in Qom. Qom Univ Med Sciense Journal .2013;6(4):81-7.

19.Anbari K, Ghanadi K, Kaviani M, Montazeri R. The self care and its related factors in diabetic patients of khorramabad city. Yafteh J. 2012;14:49-57.

20.Jordan DN, Jordan JL. Self-care behaviors of Filipino-American adults with type 2 diabetes mellitus. Journal of Diabetes and its Complications. 2010;24(4):250-8.

21.Vosoghi Karkazloo N, Abootalebi Daryasari Gh, Farahani B, Mohammadnezhad E, Sajjadi A. The Study of Self-Care Agency in Patients with Diabetes (Ardabil).Journal of Birjand University of Medical Sciences.2010:8(4);197-204.

22.Hemmati Z, Alidoosti M, Raesee M. Campression sleep quality in patient with diabetic and non diabetice. journal payesh. 2012;11(6):863-7.

23.Tsai YW, Kann NH, Tung TH, Chao YJ, Lin CJ, Chang KC, et al. Impact of subjective sleep quality on glycemic control in type 2 diabetes mellitus. Family Practice. 2012;29:30-5.

24.Sadeghi Sedeh B, Talaei A, Parham M, Sadeghi A, Sadeghi Sedeh S. Comparison of quality and type of sleep disorders in good control and uncontroled diabetic type2 patients. journal of shahrekord university of medical sciences. 2017;19(3.(

25.Ohkuma T, Fujii H, Iwase M, Kikuchi Y, Ogata S, Idewaki Y, et al. Impact of Sleep Duration on Obesity and the Glycemic Level in Patients WithType 2 Diabetes The Fukuoka Diabetes Registry. Diabetes Care. 2013;36(3):611-7.