Research Article / Araştırma Makalesi

Evaluation of Self-Care Levels and Affecting Factors in Diabetes Patients

Diyabet Hastalarında Öz Bakım Düzeyi ve Etkileyen Faktörlerin Değerlendirilmesi

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Abstract

One of the most important factors in the management of diabetes is the level of self-care of patients. It reduces mortality and morbidity and is an important marker in the course of the disease. In our study, we aimed to evaluate the self-care level of diabetic patients admitted to our hospital and the factors that may affect self-care. Diabetes patients admitted to the Diabetes and Obesity Outpatient Clinic of our hospital were examined in a 4-month period between May 15, 2021 and September 15, 2021. After verbal information, a 71-question questionnaire including sociodemographic characteristics, lifestyle, education and treatments, body mass index, waist circumference and Diabetes Self-Care Scale was applied face-to-face to patients who agreed to participate in our study. Measurements were made by the researchers. $p < 0.05$ was accepted as statistical significance. The study included 132 diabetic patients, 83 women and 49 men. The mean score obtained from the Diabetes Self-Care Scale was 96.25±19.61. Factors that interacted with self-care were educational status ($p < 0.001$), income level ($p < 0.001$), receiving education about the disease from the doctor ($p = 0.007$), diet ($p = 0.003$) and exercise ($p = 0.005$) in the treatment, frequency of control ($p < 0.001$), waist circumference ($p < 0.001$) and body mass index ($p < 0.001$). Management of existing patients is as important as prevention of diabetes. Self-care is an important factor in the management of the disease. Every intervention to increase self-care leads to positive results in the management of the disease.
Keywords: Self-care; Diabetes mellitus; Body mass index; Diet; Exercise

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Özet

Diyabet hastalığının idamesinde en önemli faktörlerden bir tanesi hastaların öz bakım düzeyidir. Mortalite ve morbiditeyi azalttığı gibi, hastalığın seyrinde önemli bir belirteçtir. Çalışmamızda hastanemize başvuran diyabet hastalarının öz bakım düzeyi ile birlikte, öz bakıma etki edebilecek faktörlerin değerlendirilmesi amaçlanmıştır. Hastanemiz Diyabet ve Obezite Polikliniği'ne başvuran diyabet hastaları, 15 Mayıs 2021 – 15 Eylül 2021 tarihleri arasında 4 aylık süreçte incelenmiştir. Sözel olarak yapılan bilgilendirme sonrasında çalışmamıza katılmayı kabul eden hastalara sosyodemografik özellikler, yaşam şekilleri, aldıkları eğitim ve tedaviler, beden kitle indeksi, bel çevresi ve Diyabet Öz Bakım Ölçeği'ni içeren 71 soruluk anket yüz yüze uygulanmıştır. Ölçümler araştırmacılar tarafından yapılmıştır. $p < 0.05$ istatistiksel anlamlılık olarak kabul edilmiştir. Çalışmaya 83'ü kadın, 49'u erkek, 132 diyabet hastası dahil edilmiştir. Diyabet Öz Bakım Ölçeği'nden alınan puan ortalaması 96,25±19,61 olarak saptanmıştır. Öz bakım ile etkileşen faktörler olarak eğitim durumu ($p < 0,001$), gelir seviyesi ($p < 0,001$), hastalık ile ilgili eğitimi doktordan almak ($p = 0,007$), tedavide diyet ($p = 0,003$) ve egzersizin ($p = 0,005$) yer alması, kontrol sıklığı ($p < 0,001$), bel çevresi ($p < 0,001$) ve beden kitle indeksi ($p < 0,001$) tespit edilmiştir. Diyabetin önlenmesi kadar önem verilmesi gereken bir konu da, mevcut hastaların yönetimidir. Öz bakım, hastalığın yönetiminde önemli bir etkendir. Öz bakımın arttırılması için yapılan her müdahale, hastalığın yönetiminde olumlu sonuçlara neden olmaktadır.
Anahtar Kelimeler: Özbakım; Diabetes mellitus; Beden kitle indeksi; Diyet; Egzersiz

1. Introduction

Diabetes is a chronic metabolic disorder caused by defects in insulin deficiency or action, requiring continuous medical care and dedication. The main aim of treatment is to ensure glycemic control during the day, to prevent acute and chronic complications, to solve the accompanying problems, and thus to improve the expected survival and quality of life in patients with diabetes (1).

Today, chronic diseases that share similar risk factors with diabetes constitute an important health problem. With the rapid change in lifestyle, the prevalence of type 2 diabetes is rapidly increasing in developed and developing societies (2).

In its 10th Diabetes Atlas published in 2021, the International Diabetes Federation reported that 537 million adults worldwide have diabetes. This number, which means that approximately 1 in every 10 people has diabetes, is thought to be 783 million in 2045 (3).

According to the 2010 Turkiye Diabetes, Hypertension, Obesity and Endocrinologic Diseases Prevalence Study (TURDEP-2) conducted in Turkiye, the prevalence of diabetes increased from 7.2% to 13.7% between 1998 and 2010 and the level of awareness about diabetes was reported as 45% (4).

The American Diabetes Association predicted that the financial burden of diabetes in the United States was 132 billion US dollars in 2002 and would increase to 192 billion US dollars by 2020 (5). In a study conducted in Turkiye in 2009, in which the cost of complications of type 2 diabetes was investigated, the financial burden of cardiovascular, renal, ophthalmologic and neurologic complications in individuals with diabetes was examined, and it was estimated that the cost to the Social Security Institution would be 13 billion TL (6).

In order to reduce this burden, it is important that patients are aware and have strong self-care. Patients who can self-monitor their blood glucose levels, pay attention to their diet and lifestyle and follow the recommendations of the physician can both maintain their diabetes with less cost and keep their quality of life high by protecting them from complications (7). In diabetes, which is a chronic disease, adherence to appropriate self-care behaviors increases glycemic control (8).

In our study, we aimed to evaluate the level of diabetes-related self-care and factors that may interact with self-care in adult patients who applied to the diabetes outpatient clinic of our hospital.

2. Materials and Methods

Our study is a cross-sectional study and was conducted between May 15, 2021 and September 15, 2021 in patients with diabetes mellitus diagnosed for at least 1 year who applied to Trakya University Health Center for Medical Research and Practice Obesity and Diabetes Outpatient Clinic. Ethics committee approval was obtained with the decision of Trakya University Faculty of Medicine Scientific Research Ethics Committee on 26 April 2021 (No:2021/197). After obtaining verbal consent from the patients, a total of 71-question questionnaire consisting of sociodemographic data, education and treatments received, lifestyle, height-weight, waist circumference and body mass index (BMI), and Diabetes Self-Care Scale (DSCS) was applied by face-to-face interview method. Height, weight and waist circumference measurements were made by the researchers.

Diabetes Self-Care Scale

The Diabetes Self-Care Scale was developed in the USA in 2005 under the leadership of Lee and Fisher to determine the self-care levels of individuals diagnosed with diabetes mellitus (9). The Cronbach alpha level of the original scale was 0.80. The Turkish validity and reliability study of the scale was conducted by Karakurt in 2008. The results of the analysis showed that the Turkish version of the scale had a 0.81 Cronbach alpha level, had high validity and reliability, and was suitable for application to the Turkish population (10). The scale is a 4-option Likert-type scale and contains 35 items. The

minimum score is 35 and the maximum score is 140; the higher the score, the better the self-care level in patients with diabetes. A score of 92 and above is considered acceptable. The items in the scale include feeding time and status, doing regular physical activity, using treatment as recommended, measuring and recording blood glucose, going to doctor follow-ups for blood glucose control, foot care and understanding its importance, personal hygiene methods, and having knowledge about diabetes and the complications it may cause.

Statistical analysis

Considering the number of patients in Trakya University Health Center for Medical Research and Practice Obesity and Diabetes Outpatient Clinic for the previous months, it is expected that approximately 300 diabetes patients will apply during the study period. When the sample size was calculated with 5% type-1 error and 80% power, at least 114 individuals were planned to be included in the study. A total of 132 patients who agreed to participate within the specified period were included in the study.

Statistical analysis of the data was performed with SPSS 19 package program. Numerical data are given as mean, standard deviation, minimum and maximum values; distribution data are given as n (number) and % (percentage). In the analysis of our data, descriptive statistics and nonparametric tests Mann Whitney-U, Kruskal-Wallis were conducted. Spearman analysis were used for correlation analysis. Statistical significance level was considered significant when $p < 0.05$.

3. Results

A total of 132 participants, 83 (62.9%) female and 49 (37.1%) male, were included in the study.

The mean score of the diabetic patients who participated in our study was 96.25±19.61 (minimum 50, maximum 125).

The mean DSCS scores of the participants according to the sociodemographic attributes were given in the table (Table 1).

Table 1. The mean scores of the participants according to the sociodemographic attributes

		n (%)	Mean of DSCS	p
Gender	Female	83 (62.9)	97.48±19.60	0.305*
	Male	49 (37.1)	94.18±19.66	
Educational status	Illiterate	7 (5.3)	64.85±7.86	<0.001**
	Primary school	62 (46.9)	92.77±19.68	
	Secondary school	14 (10.7)	102.50±15.50	
	High school	28 (21.2)	99.60±18.87	
	University or higher	21 (15.9)	108.38±10.14	
Marital status	Single	35 (26.5)	99.37±19.71	0.223*
	Married	97 (73.5)	95.13±19.56	
Income and expenditure status	Income less than expenditure	41 (31.1)	85.60±20.94	<0.001**
	Income equal to expenditure	62 (47.0)	98.79±17.33	
	Income more than expenditure	29 (21.9)	105.89±15.57	
Duariton of diabetes	< 5 years	39 (29.5)	93.00±21.19	0.181**
	5-10 years	29 (21.9)	92.06±22.07	
	> 10 years	64 (48.5)	100.14±16.80	
Presence of diabetes in the family	Yes	80 (60.6)	97.71±18.54	0.505*
	No	52 (39.4)	94.01±21.14	

*n=number, DSCS: Diabetes Self Care Scale, *Mann-Whitney U, **Kruskal-Wallis H*

Of the participants who received diabetes-related education, 96 (72.7%) stated that they received education on foot care, 103 (78.1%) on nutrition plan, 100 (75.8%) on exercise, 103 (78.1%) on hyperglycemia, 105 (79.6%) on drug use, and 99 (75.0%) on hypoglycemia. The number of participants who stated their doctor as the source of information was 84 (63.6%), 80 (60.6%) said a nurse, 20 (15.2%) said family and friends, 41 (31.1%) said written or visual media (TV, books, magazines, newspapers, etc.), and 14 (10.6%) said social media (Twitter, Facebook, Instagram, etc.). Patients who received information from the doctor had statistically significantly higher scores on the DSCS (p=0.007).

The mean DSCS scores of the participants according to the treatment they used were given in the table (Table 2).

Table 2. The mean DSCS scores of the participants according to the treatment they used

		n (%)	Mean of DSCS	Median	P*
Diet	Yes	106 (80.30)	98.96±18.71	102	**0.003**
	No	26 (19.70)	85.23±19.66	81	
Exercise	Yes	4 (3.03)	98.98±19.05	102	**0.005**
	No	128 (96.97)	87.75±19.16	84.5	
Oral Antidiabetics	Yes	90 (68.18)	95.50±20.50	99.50	0,698
	No	42 (31.82)	97.88±17.68	102	
Insulin	Yes	70 (53.03)	99.65±17.61	102	0,068
	No	62 (46.97)	92.41±21.14	97	
Herbal products	Yes	4 (3.03)	85.75±27.42	85.5	0,469
	No	128 (96.97)	96,58±19.37	100.5	

n=number, DSCS: Diabetes Self Care Scale, *Mann-Whitney U

While 20 (15.2%) of the participants visited the doctor once a month, 19 (14.4%) visited the doctor once in every 2 months, 41 (31.0%) once in every 3 months, 20 (15.2%) once in every 6 months, and 32 (24.2%) once a year. A statistically significant correlation was found between the frequency of diabetes control and the score on the DSCS (p<0.001). It was determined that the self-care level increased as the frequency of control increased. The distribution of diabetes-related complications and the mean scores of the DSCS were given in the table (Table 3)

Table 3. Complications due to diabetes and mean scores of DSCS

		n (%)	Mean of DSCS	Median	p*
Eye disease	Yes	18 (13.6)	98.83±21.9	103	0.229
	No	114 (86.4)	94.44±19.4	98	
Kidney disease	Yes	28 (21.2)	90.50±21.3	97	0.181
	No	104 (78.8)	96.26±19.2	100	
Nerve damage	Yes	31 (23.5)	89.23±21.8	98	0.107
	No	101 (76.5)	96.82±18.9	101	
Cardiovascular disease	Yes	21 (15.9)	86.33±19.6	95	**0.019**
	No	111 (84.1)	96.68±19.4	101	
Foot wound	Yes	15 (11.4)	91.67±21.6	99	0.544
	No	117 (88.6)	95.47±19.6	99	
Cerebrovascular disease	Yes	7 (5.3)	77.57±20.4	72	**0.036**
	No	125 (94.7)	96.02±19.3	99	

n=number, DSCS: Diabetes Self Care Scale, *Mann-Whitney U

It was found that as the educational status and income level increased, the participants' DSCS scores increased (p<0.001 for both). Among the participants, 2 (1.5%) were underweight, 20 (15.1%) were normal, 42 (31.9%) were overweight, 39 (29.5%) were mildly obese, 22 (16.7%) were moderately obese, and 7 (5.3%) were morbidly obese. A statistically significant and inverse correlation was found between self-care level and body weight, waist circumference and body mass index (BMI) (Table 4).

Table 4. Relationship between the DSCS score and body weight, height, waist circumference and BMI

	Mean of DSCS	Median	r	p
Body weight (kg)	83.54±17.57	80.5	-0.393	**<0.001**
Height (cm)	164.81±8.36	164	-0.011	0.897
Waist circumference (cm)	105.13±16.73	105	-0.410	**<0.001**
BMI	30.76±6.12	30.17	-0.412	**<0.001**

BMI: Body mass index, DSCS: Diabetes Self Care Scale, r: Spearman rho

No statistical significance was found between the participants' DSCS scores and gender (p=0.305), marital status (p=0.223), duration of diabetes (p=0.181), hospitalization due to diabetes (p=0.341), and presence of diabetes in the family (p=0.505).

4. Discussion

Diabetes is a chronic health problem whose importance is increasing day by day in the world due to its frequency and the problems it causes in the patient's life. With the rapid change in lifestyle, the prevalence of type 2 diabetes is increasing rapidly in all societies. Diabetes negatively affects individuals of all ages.

The key point in healthy aging of patients with diabetes mellitus is self-care. Patients should take over the management of their disease by gaining knowledge and skills and improving the methods and techniques they apply in the self-care process (11,12). People who can take care of themselves and change their lifestyle can be effectively protected from complications.

The mean score of the diabetic patients who participated in our study was found to be 96.25±19.61 (minimum 50, maximum 125). Since the minimum acceptable score level of the scale is 92, the mean self-care score in our study can be considered as acceptable. In the study of Karakurt (10) conducted in Turkiye, the mean score of the DSCS was found to be 82.84, and 81.6 in the study of Karasoy (13). The reason for these differences may be the sociocultural differences in the regions where the studies were conducted.

In our study, no statistically significant difference was found in terms of the score of the DSCS according to gender. However, unlike our study, there are studies in the literature in which self-care in female diabetic patients was found to be higher than male patients (10,14,15). It can be said that social differences between men and women in Edirne are less than in other studies and therefore self-care levels are similar.

It has been found in many studies that education level and diabetes are related, and diabetes is seen more frequently as the education level decreases (16,17). According to the results of our study, it was observed that the lower the level of education, the lower the score on the DSCS. Our results are similar to the literature in this respect. Dehghani-Tafti et al. reported that diabetics who graduated from primary school had lower self-care behavior scores than university graduates (18). Based on this, they argued that self-care behaviors would increase with increasing education levels. In the self-care study conducted by Kassahun et al. in 2016, it was determined that the education level of diabetes patients was low and the mean score of the DSCS decreased as patient education decreased (19). Similar to our study, Alheik et al. reported in

their self-care study conducted in 2019 that self-care management was increasing in diabetes patients with university and higher education (20). Based on all research findings, we can think that individuals with diabetes who have a higher level of education value self-care more and understand its importance better. This shows that individuals with low education level are at higher risk and that education of these individuals should be emphasized.

In our study, it was found that the patients' score on the DSCS and the regular application of physical exercise and dietary treatment had a statistically significant effect on each other. These results of our study are similar to the literature (15,21-23). The high self-care levels of patients who perform regular physical activity and follow dietary recommendations may be the most important step taken by individuals to manage their diseases.

A statistical significance was found between the patients' diabetes-related education status and the DSCS score. Accordingly, the self-care levels of patients who received education and information were found to be higher than those who did not. In a 2017 study evaluating the factors affecting self-care, it was stated that one of the most important reasons affecting the low self-care level of patients was that patients did not have sufficient information about diabetes and its regulation. A decrease was observed in the diabetes self-care level of patients who were not informed (24). In a similar study on diabetes self-care conducted by Ishak et al., it was determined that patients with a higher level of knowledge in line with the education they received about diabetes had a higher level of self-care (25). Orem stated that there is a parallel interaction between the self-care power of the person and the level of knowledge in the self-care theory and that a sufficient level of knowledge further improves the self-care power (26). In their 2019 study, Alhaik et al. stated that educational programs to be organized for diabetes will contribute positively by increasing the level of knowledge about self-care (20). Education is a factor that makes a difference not only in diabetes but in every aspect of life. The high and significant average supports this idea. At the same time, it shows that the education given to the patients has achieved its purpose. The patient who requests information about how to do self-care from the health counselor is open to putting what they have learned into practice and getting better. In our study, the mean score of the DSCS was found to be significantly higher in patients whose source of information was a doctor. The reason for this is that the patient who receives information from a scientifically trained person is better at self-care.

In our study, a statistically significant relationship was found between the frequency of diabetes control and self-care. Those with 6-month and less frequent check-ups had lower self-care levels than those with more frequent check-ups. Similar to our study, in the studies of Kalaycı, and Usluoğlu, the mean scores of those who had frequent check-ups were higher (27,28). Frequent visits to controls show that patients care about treatment and controls. The patient who comes to health visits frequently will notice the slightest change in the course of his/her disease; then will request the appropriate treatment from the health counselor as soon as possible. Possible complications will be recognized and intervened early in the patient who will be in constant communication with health professionals. Patients with poor self-care can be invited to visits more frequently, leading to an improvement in self-care and complication rates.

Self-care levels were found to be lower in patients with cardiovascular and cerebrovascular complications in our study. The reason for this may be that patients who develop inadequacy in organ functions after vascular complications have difficulty in self-care. Ishak et al. also found that self-care levels were significantly lower in patients with microvascular complications, which is consistent with our study (25).

A statistically significant and inverse correlation was found between the self-care level of the participants and BMI. Obese individuals are also expected to have worse self-care. Exercise and diet are part of self-

care. The high level of self-care in participants who exercised regularly in our study supports this idea. Our study shows that all patients with diabetes should be followed up in terms of obesity, and risk management should be performed.

Waist circumference is considered to be 88 cm for women and 102 cm for men. In the study of Karakurt, waist circumference was 104.84 cm before self-care training and 103.87 cm after training (10). In the study by Wolf et al. in which type 2 diabetes patients were trained for 12 months and the results were evaluated, 118.1 cm. was found and a decrease in waist circumference was observed after training (29). Education not only raised the awareness of the patients but also helped them to avoid obesity with their diet. In our study, the mean waist circumference of the patients was found to be 105.13±16.73 cm. Positive effects on self-care and obesity with education will improve the course of the disease.

Our study showed that high self-care in diabetic patients is important in disease maintenance. Self-care is also influenced by many factors, many of which can be changed at any stage of the health system. Our study has shown that focusing on modifiable factors, rather than focusing on drug therapies, can lead to much more favorable outcomes in the course of the disease. At the same time, education provided by competent people makes a significant positive difference in the self-care of people with diabetes.

Limitations

Our study was conducted at Trakya University Health Center for Medical Research and Practice Obesity and Diabetes Outpatient Clinic. Differences in the other centers where the patients were followed up and the health services they received may change the self-care outcomes. Due to sociocultural differences, multicenter and larger studies are needed to reflect Turkiye in general.

5. Conclusion

The prevalence of diabetes is increasing with the change in lifestyle all over the world and it is predicted to be an even more serious problem in the coming years. Improving the course of the disease and reducing mortality and morbidity are as important as interventions to prevent the disease. Improvement interventions related to self-care constitute the basis of success in the fight against the disease in individuals with diabetes. Increasing income, increasing the frequency of check-ups, giving nutrition and exercise the importance they deserve, decreasing waist circumference and BMI, along with education provided by competent people are factors that should be given importance in increasing self-care and managing the disease.

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