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Patients With Type 2 Diabetes Mellitus: Obstacles in Coping

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ABSTRACT

Background: Diabetes mellitus is a major global threat to public health. Reducing the daily obstacles of coping with the disease for patients with diabetes may improve management.

Purpose: The aim of this study was to investigate daily obstacles to coping with Type 2 diabetes mellitus (T2DM) and related factors.

Methods: A descriptive and cross-sectional design was used. Data were collected from 186 patients with T2DM who were hospitalized in an endocrinology clinic in Turkey. The Hospital Anxiety and Depression Scale and the Diabetes Obstacles Questionnaire were used to collect data. Multiple linear regression analysis was performed to explore the predictors of obstacles to coping in patients with T2DM.

Results: The highest mean score was achieved on the obstacles to coping with diabetes (2.57 ± 3.78) among the subscales of the Diabetes Obstacles Questionnaire. After regression analysis, level of treatment compliance was identified as the most significant predictor (β = .289, p < .001). Anxiety, depression, smoking status, and highest level of education were also identified as significant predictors.

Conclusions: On the basis of these results, nurses should plan and implement interventions to improve treatment compliance and assist patients to overcome obstacles to disease management. Moreover, patient anxiety, depression, and lifestyle behaviors should be addressed.

KEY WORDS:
affecting factors, nursing, obstacles encountered, patients, type 2 diabetes mellitus.

Introduction

Diabetes is considered one of the most important health problems of the 21st century. Diabetes and its complications are currently among the leading causes of death in many countries. In 2017, 424.9 million people aged 20–79 years and 451 million people aged 18–99 years were living with diabetes. By 2, 045, 629 million people aged 20–79 years and 693 million people aged 18–99 years are expected to suffer from diabetes worldwide (Cho et al., 2018).

In a study performed on 26,499 individuals aged 20 years and older in Turkey, it was determined that the incidence of diabetes has reached 13.7%, the rate of increase for diabetes is 90%, and the incidence of impaired glucose tolerance has reached 7.9% (Satman et al., 2013). On the basis of these estimates, Turkey will be among the top 10 highest populations of persons with diabetes worldwide in 2035 (International Diabetes Federation, 2015).

It is important to prevent complications of diabetes to decrease the burden of this disease on individuals and society (Turkish Ministry of Health, Public Health Institution, 2014). Patients with diabetes must monitor and manage their disease to prevent complications. However, patients often face obstacles to successful monitoring that may hinder optimal disease management (Boussageon, Gueyffier, & Cornu, 2014; Song & Kim, 2009). Decreasing disease symptoms, emergency admissions, and hospitalizations; reducing disease-related physiological and psychological effects; preventing dependence on caregivers; and enhancing quality of life may be achieved through effective and sustainable disease management (Demirağ, 2009; Haskett, 2006). If obstacles to self-management are not identified, noncompliance with recommended self-care treatments and complications such as hypoglycemia and impairment in health and quality of life may result (Munshi et al., 2013). Reducing obstacles to coping with disease in patients with diabetes may improve management efficacy and health-related outcomes.

Wilkinson, Whitehead, and Ritchie (2014) reported that communication, education, personal factors, provider issues, and support were identified as inhibiting diabetes management. Nam, Chesla, Stotts, Kroon, and Janson (2011) noted that the commitment, health beliefs, attitudes, and knowledge of patients; financial resources; concomitant diseases; social support; and the attitudes, beliefs, and knowledge of clinicians regarding diabetes were factors inhibiting diabetes management. In a pilot study by Harwood, Bunn, Caton, and Simmons (2013), psychological problems, family problems, nonsupportive environment, communication problems,

physical and psychiatric diseases, educational problems, and problems associated with access to healthcare services were identified as factors inhibiting diabetes management. In Laranjo et al. (2015), related factors included diet, physical exercise, and glycemic control. Finally, Booth, Lowis, Dean, Hunter, and McKinley (2013) divided these factors into six categories, including difficulty in changing habits, negative perception toward a "new" or recommended regimen, social conditions, lack of knowledge and understanding, lack of motivation, and obstacles regarding making lifestyle changes.

Risk of anxiety and depression was found to be high in patients with Type 2 diabetes mellitus (T2DM; Gemeay et al., 2015; Meurs et al., 2016; Sayın, Sayın , Bursalı, & İpek, 2019). Depression and anxiety in patients with T2DM were found to adversely affect treatment compliance and prognosis (Roy & Lloyd, 2012). Depression not only is a common comorbidity in patients with diabetes but also may be an obstacle to coping with the disease in daily life (Chen, Ruppert, Charron-Prochownik, Noullet, & Zgibor, 2011).

Although the coping skills of patients with T2DM have been closely associated with compliance to treatment, this issue has not been a focus of attention (Rätsep, Kalda, Oja, & Lember, 2006). In the literature, several obstacles to diabetes management have been defined in different populations (Booth et al., 2013; Byers, Garth, Manley, & Chlebowy, 2016; Harwood et al., 2013; Laranjo et al., 2015). The obstacles to coping with diabetes in Turkey have not yet been studied. Moreover, although the effects of self-perceptions and disease on daily life have been described, the effects of specific sociodemographic and disease characteristics on disease care in daily life have not yet been examined. Only one previous Turkish study (Pilv, Rätsep, Oona, & Kalda, 2012) has used the Diabetes Obstacles Questionnaire (DOQ) that was used in this study. Another significant difference of this study is the investigation of the respective effects of anxiety and depression on obstacles to disease management. Identification of the obstacles to coping with diabetes is expected to improve metabolic control and self-management of diabetes and enhance the quality of diabetes care. Identification of these obstacles is also expected to shed light on advanced studies for the treatment of patients with T2DM (Nam et al., 2011). Therefore, on the basis of the above, the obstacles to coping in daily life experienced by patients with T2DM and the factors associated with these obstacles were examined in this study.

Methods

Study Design

The aim of this descriptive and cross-sectional study was to investigate the obstacles to disease management encountered in daily life by patients with T2DM and the factors affecting these obstacles. The following two research questions were addressed:

1. What are the obstacles encountered in daily life to coping with T2DM?
2. What are the factors that significantly affect these obstacles?

Sample and Participants

The sample for this study was composed of patients with T2DM who were hospitalized in the endocrinology departments of a university hospital and a state hospital in Turkey. Inclusion criteria were having a diagnosis of T2DM; being hospitalized in the internal medicine and endocrinology services department; being able to communicate verbally; and being free of neurological, cognitive, visual, and auditory problems. The desired sample size was calculated, using the formula of sample size determination for finite populations (over the incidence of diabetes as 13.7%; $p = .14$ for the occurrence of event, $q = .86$ for the nonoccurrence of the event; $t = 1.96$, $d = 0.05$), as 185 (Erdoğan, Nahcivan, & Esin, 2014). One hundred eighty-six qualified patients provided informed consent and were enrolled as participants in this study.

Data Collection

All patients with T2DM hospitalized in the endocrinology clinic of a university hospital and a state hospital between September 2016 and June 2017 were approached as potential participants. Study data were collected using face-to-face interviews that lasted for a mean duration of 20–25 minutes.

Data Collection Instruments

A demographics and clinical characteristics datasheet, DOQ, and Hospital Anxiety and Depression (HAD) scale were used for data collection.

Demographics and clinical characteristics datasheet

The 17 questions gathered information on participant demographics and clinical characteristics, including gender, age, marital status, educational level, smoking status, time since diagnosis, diabetes treatment status, diabetes follow-up status, blood glucose level, exercise, treatment compliance status, diabetes complications, and number of hospitalizations during the last year.

Diabetes obstacles questionnaire

The DOQ, published by Hearnshaw et al. in 2007, consists of eight subscales with 78 questions. The subscales include medication obstacles (10 items), self-monitoring (five items), knowledge and belief obstacles (10 items), obstacles in diagnosis (six items), obstacles in the relationship with healthcare professionals (18 items), lifestyle changes (13 items), obstacles in coping with diabetes (eight items), and obstacles in receiving suggestions and support (eight items). Each of the subscales is graded on a 5-point Likert scale ranging from "totally agree" to "totally disagree." The average score for

each subscale is added together to obtain the total scale score. Scores ranged from 2 points for "totally agree" to –2 points for "totally disagree." Negative scores indicate that the respondent does not experience any difficulty with the item. The average score obtained for each subscale reflects the degree of difficulty experienced by the respondent (Hearnshaw et al., 2007). A validity and reliability study of the Turkish version of the DOQ was carried out by Kahraman et al. (2016). In the reliability study, 10 questions were removed from each subscale because they were not relevant to the Turkish population. The internal consistency reliability for DOQ subscales, as tested using Cronbach's alpha coefficient, ranged from .63 to .84, and the test–retest reliability of the subscales ranged from .87 to .97.

Hospital anxiety and depression scale

The HAD scale, originally developed by Zigmond and Snaith (1983), includes 14 questions, seven of which (odd numbers) are used to measure anxiety, with the other seven (even numbers) used to measure depression. Items are scored on a 4-point Likert-type scale (Zigmond & Snaith, 1983). A validity and reliability study of the Turkish version of the HAD scale was carried out by Aydemir, Guvenir, Küey, and Kültür (1997). In terms of reliability, the HAD scale earned a Cronbach's alpha of .85 for the anxiety subscale and .78 for the depression subscale. The test–retest reliability of the HAD scale was .72 for the anxiety subscale and .76 for the depression subscale. The cutoff point was 10/11 for the anxiety subscale and 7/8 for the depression subscale, with those scoring above these cutoff points considered at risk (Aydemir et al., 1997).

Ethical Considerations

Before data were collected, approval was received from the Pamukkale University Non-interventional Clinical Research Ethic Committee (Approval Number 60116787-020/29027, date of approval: May 5, 2016), a written permit was obtained from each of the participating hospitals, and all of the participants provided informed consent. Furthermore, permission to use their results was secured from the authors who conducted the validity and reliability study on the DOQ.

Data Analysis

IBM SPSS Statistics Version 22.0 (IBM, Inc., Armonk, NY, USA) was used for statistical analysis. To assess the socio-demographic and disease-associated characteristics of participants, distribution of numbers and percentages, mean scores, and standard deviations for the DOQ and HAD scale were calculated. Correlation analysis was used to evaluate the relationship between diabetes obstacles and hospital depression anxiety level. Before conducting regression analysis, univariate analysis (independent-samples t test, one-way analysis of variance, and correlation analysis) was used to determine the relationship between independent variables and the obstacles encountered in coping with T2DM in daily life.

These analyses were made to determine the independent variables to be used in the multiple linear regression model. In addition, multiple linear regression analysis was performed to identify the basic predictors concerning obstacles to coping with the disease that are encountered daily by patients with T2DM. In addition to the levels of anxiety and depression, demographic and disease-associated independent variables that were found to be significant in the univariate analysis (gender, educational level, smoking status, type of disease treatment, blood glucose level, exercise habits, and treatment compliance status) were included in the multiple linear regression. For the regression analysis, the results were considered as statistically significant at $p < .05$.

Results

Slightly more than half of the participants were male ($n = 101$, 54.3%). Most were less than 65 years old ($n = 120$, 64.5%), most (88.7%) were married, 88.2% had an educational level of primary school or less, most (80.6%) were nonsmokers, half (48.9%) had lived with diabetes for more than 10 years, and most ($n = 141$, 75.8%) were currently being treated with insulin (Table 1).

Most of the participants (78.5%) self-reported as performing blood glucose measurements regularly. Nearly two thirds (60.2%) did not exercise regularly, and nearly two thirds (60.8%) had a moderate level of treatment compliance. Neuropathy was the most frequently noted complication experienced (45.7%). In terms of the frequency of follow-ups, 39.2% had been admitted to a hospital at least once for diabetes within the most recent 1- to 6-month period, whereas 66.7% had been hospitalized at least once within the previous year (Table 1).

The mean scores for depression and anxiety were 8.62 ± 4.20 and 9.23 ± 4.68, respectively, which are above and below the respective cutoff points for these measures. The highest mean subscale score on the DOQ was obstacles to coping with diabetes (2.57 ± 3.78), followed by obstacles to self-monitoring (1.31 ± 3.62), obstacles to diagnosis (0.38 ± 2.81), and lifestyle changes (0.16 ± 6.55). Furthermore, the results indicate that the participants did not experience medication obstacles, knowledge and belief obstacles, obstacles to receiving suggestions and support, or obstacles to their relationship with healthcare professionals (Table 2).

A statistically significant correlation was found between the hospital depression anxiety level of the participants and the obstacles they encountered in coping with T2DM in daily life (Table 3).

The R^2 for this regression model was .285, indicating that approximately 28% of the variance in overall obstacles was explained by the independent variables (i.e., treatment compliance level, anxiety and depression level, and smoking, educational level; Table 4). The Durbin–Watson statistic was 1.854 (below 2.50), which did not reveal an autocorrelation among the residuals, confirming the suitability of using regression for analysis. On the basis of the results of the

TABLE 1.
Demographic and Clinical Characteristics of Participants (N = 186)

Characteristic	n	%
Gender		
Female	85	45.7
Male	101	54.3
Age (years)		
≤ 65	120	64.5
> 65	66	35.5
Married		
Yes	165	88.7
No	21	11.3
Education		
Primary school or less	164	88.2
High school or less	15	8.1
College or higher	7	3.7
Smoker		
Yes	36	19.4
No	150	80.6
Time since diagnosis, years		
≤ 5	43	23.1
6–10	52	28.0
> 10	91	48.9
Type of treatment of the disease		
Oral medication	18	9.7
Insulin	141	75.8
Oral medication + insulin	27	14.5
Diabetes follow-up		
None	15	88.1
1–6 months	73	39.2
7–12 months	46	24.7
Rarely	52	28.0
Measurement of blood glucose		
Yes	146	78.5
No	40	21.5
Exercise		
Yes	74	39.8
No	112	60.2
Treatment compliance		
Good	62	33.3
Moderate	113	60.8
Bad	11	5.9
Diabetes complications		
Retinopathy	21	11.3
Nephropathy	8	4.3
Neuropathy	85	45.7
Diabetic foot	47	25.3
≥ 2 complications	25	13.4
Hospitalization in the last year		
Once	124	66.7
≥ 2 times	62	33.3

TABLE 2.
Overall and Subscale Scores for the Diabetes Obstacles Questionnaire (N = 186)

Obstacle	Mean	SD
Medication obstacles	−4.27	4.58
Self-monitoring obstacles	1.31	3.62
Knowledge and belief obstacles	−4.04	5.04
Obstacles in diagnosis	0.38	2.81
Obstacles in the relationship with healthcare professionals	−8.52	7.22
Lifestyle changes obstacles	0.16	6.56
Obstacles in coping with diabetes	2.57	3.78
Obstacles in receiving suggestions and support	−0.99	4.14
Overall total	−13.63	21.72

TABLE 3.
Relationship Between the Diabetes Obstacles Questionnaire and Hospital Anxiety and Depression Scale (N = 186)

	DOQ	
Scale	r	p
Anxiety	.399	< .001
Depression	.350	< .001

Note. DOQ = Diabetes Obstacles Questionnaire.

TABLE 4.
Multiple Linear Regression Analysis of the Independent Variables of the Diabetes Obstacles Questionnaire

Independent Variable	β	t	p
Education	−.130	−1.950	.053
Treatment compliance	.289	4.309	< .001***
Smoking	−.138	−2.107	.036**
Anxiety	.208	2.587	.010**
Depression	.158	2.001	.047**

Note. R^2 = .285, Durbin–Watson = 1.854.
**$p < .01$. ***$p < .001$.

regression analysis, the level of treatment compliance was the most significant predictor of obstacles to coping with T2DM (β = .289, $p < .001$). Other significant predictors included, by order of importance, anxiety level (β = .208, $p < .05$) and depression level (β = .158, $p < .05$), smoking status (β = −.138, $p < .05$), and educational level (β = −.130, $p = .053$), respectively (Table 4).

Discussion

To successfully manage diabetes, obstacles to coping must be identified to encourage compliance with diabetes standards in self-management and clinical interventions (Nam et al., 2011). Therefore, the types of daily obstacles experienced by participants in coping with T2DM and factors affecting these obstacles were examined in this study. Participants experienced obstacles in four areas of the DOQ, including "coping with disease," "self-monitoring," "obstacles in the diagnosis of disease," and "making changes in lifestyle."

"Coping with disease" in daily life was the most significant obstacle identified in this study, showing that participants experienced serious deficiencies in accepting and coping with T2DM. Patients with T2DM are subject to many requirements, such as compliance with treatment, lifestyle adaptations, and behavioral changes (Geisel-Marbaise & Stummer, 2009). In a study of older adults with diabetes in the United States, medication use and complex treatment plans were found to constitute significant obstacles in coping with disease (Munshı et al., 2013). In another study performed in England, motivation and lack of self-efficacy were identified as significant obstacles to coping with disease (Harwood et al., 2013). The results of this study indicate that participants experienced serious obstacles in coping with diabetes and support the importance of interventions.

"Self-monitoring" was identified as the second most important obstacle in this study. The participants identified significant difficulties with subscale items, including perceiving difficulties, disappointment, apprehension, and annoyance about measuring blood glucose. For all chronic diseases, including diabetes, a primary element of self-care is individual ability to manage healthcare. Monitoring is the most important basic self-care behavior in diabetes management. Best practice includes regular blood glucose follow-up, use of medications, foot evaluation, follow-up of acute and chronic complications, and active participation in all health-related decisions (Wilkinson & Whitehead, 2009). Pilv et al. (2012) identified fear and disappointment as significant obstacles to self-monitoring. Larenjo et al. (2015) indicated that glycemic control promotes feelings of stress and discomfort in patients, which exacerbates obstacles. Moreover, fear of injections leads to problems in self-monitoring and compliance with treatment. Patient self-monitoring is very important to the optimal management of chronic diseases such as diabetes, and poor self-monitoring may result in acute and chronic complications and impaired health and quality of life (Munshı et al., 2013).

"Diagnosis of disease" was identified as another significant obstacle to coping in this study. Obstacles in diagnosis affect whether patients take disease seriously, which may result in low compliance (Nam et al., 2011). The attitudes of physicians toward a diagnosis affect their behaviors with regard to the disease and self-management (Nam et al., 2011). Interviews conducted with individuals with diabetes in Malaysia identified that negative feelings regarding diagnosis prevented diabetes mellitus management (Mohamed, Romli, Ismail, & Winkley, 2017). These results highlight the importance of diagnosis as a potential obstacle to disease management in patients.

"Making changes in lifestyle" was also identified as a significant obstacle to coping in this study. It is known that patients who are not able to make required lifestyle changes do not gain sufficient control over their disease condition (IQVIA Institute for Human Data Science, 2017). Studies have shown that patients with T2DM experience obstacles to changing dietary, exercise, and other behavioral habits.

Byers et al. (2016) identified the difficulty of making changes in lifestyle as a significant obstacle to self-management, indicating that it was difficult to adhere to healthy diets and that family members encouraged their making healthy dietary choices. Again, Booth et al. (2013) identified making lifestyle changes as one of six obstacles to disease coping. A similar result was found in this study.

One of the goals of this study was to identify factors that predict the presence of obstacles. On the basis of the results of multiple linear regression analysis, the presence of obstacles was found as the most significant predictor treatment compliance ($\beta = .289$, $p < .001$). This means that, as the compliance to treatment increases, patients' obstacles to diabetes decrease. This outcome highlights the importance of addressing treatment compliance to reduce obstacles to coping with diabetes. Noncompliance is frequent among patients with diabetes. The need for insulin and two or more medications have both been associated with low treatment compliance levels (Nam et al., 2011). Low compliance to T2DM treatment has been linked in previous studies to higher levels of blood glucose (Doggrell & Warot, 2014; Krapek et al., 2004) and increased short- and long-term risks of complications (Stolar, 2010), which in turn, increase disease burden (Keskek et al., 2014). On the basis of the findings of this study, obstacles to patient management of diabetes may be decreased by interventions that encourage compliance.

The anxiety levels among participants in this study were relatively low, whereas levels of depression were relatively high. Studies have reported that patients with diabetes face a higher risk of depression (Sayın et al., 2019; Siddiqui, 2014). Thus, the findings in this study are in line with those of earlier studies. Anxiety and depression levels were shown in this study to increase obstacles, including noncompliance with treatment and adherence to dietary restrictions. In the literature, depressive symptoms have been estimated to affect 24%–38% of patients with T2DM, and using insulin and differences in lifestyle have been identified as risk factors for depression.

Depression has been shown to have a negative effect on necessary lifestyle changes (e.g., medication, exercises, diet) and to decrease treatment compliance. Again, poor glycemic control and hypoglycemia were associated with depression and anxiety. Invasive practices such as continuous blood glucose monitoring, hypoglycemia, and fear of injection are sources of anxiety in patients with diabetes mellitus (Groot, Golden, & Wagner, 2016). The importance of addressing patient anxiety and depression levels to decrease obstacles

to disease management was highlighted in this study. Smoking was identified in this study as another predictor of coping efficacy. Patients who smoke have lower levels of treatment compliance (Ahmed, Karter, Warton, Doan, & Weisner, 2008). The results of this study revealed the importance of changing lifestyle behaviors such as smoking to promote disease coping and self-management efficacy. Thus, lifestyle behaviors should be evaluated when planning nursing interventions to decrease obstacles in coping with diabetes.

Level of education was another variable identified in this study as a predictor of obstacles in coping. Lower educational level has been associated with lower health literacy and socioeconomic status. Therefore, these factors limit access to healthcare (Paduch et al., 2017). Health literacy helps individuals manage their health and diseases. As having a low educational level leads to low health literacy, these patients face a higher likelihood of experiencing more obstacles.

Limitations of the Study

Because of the descriptive and cross-sectional nature of this study, the results have limited generalizability. Another limitation is that, although treatment compliance was a factor associated with obstacles to the management of diabetes, the reasons for noncompliance were not investigated. Therefore, it is suggested that community-based longitudinal studies be conducted in the future.

Conclusions

The participants in this study experienced obstacles in "coping with disease," "self-monitoring," "diagnosis of the disease," and "changes regarding lifestyle." Factors predicting the presence of these obstacles were compliance to treatment, smoking, educational level, and anxiety and depression levels.

On the basis of these results, nurses should be aware of the factors predicting obstacles and of the obstacles encountered by patients in coping with illness in daily life to promote effective management of diabetes. In addition, the findings of this study support the necessity of nurses paying special attention to patients with diabetes and the importance of conducting studies that identify interventions to reduce obstacles. Nurses should implement interventions such as counseling, support groups, and training and assess the impact of these interventions on reducing the obstacles encountered by patients in coping with illness in daily life.

Furthermore, in this study, levels of anxiety and depression were shown to negatively affect lifestyle changes (e.g., medication, exercises, diet) that are important to patient management of diabetes. The anxiety and depression levels and lifestyle behaviors of the patients should also be addressed. Therefore, effective control of diabetes is helpful to the treatment of diabetes, and effective management of anxiety and depression may decrease the obstacles encountered by patients in coping with illness in daily life.

Author Contributions

Study conception and design: ÖF, ŞT
Data collection: AŞZ, ÖF, ŞT
Data analysis and interpretation: ÖF, AK, ŞT
Drafting of the article: ÖF, AŞZ, ŞT
Critical revision of the article: AK

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