Journal of Religion and Health
https://doi.org/10.1007/s10943-023-01783-x

ORIGINAL PAPER

Spiritual Well-being, Diabetes Burden, Self-management, and Glycemic Control Among Patients with Type 2 Diabetes in Turkey: A Descriptive and Correlational Study

Merve Gulbahar Eren[1] · Selda Celik[2] · Melike Celik[3] · Burcu Yon[4] · Fatma Can Ozturk[5]

Accepted: 19 February 2023

Abstract

Spiritual well-being is considered a significant factor in helping to manage chronic diseases and cope with the disease process. This descriptive-correlational study aimed to investigate the relationship between spiritual well-being, diabetes burden, self-management, and among 300 outpatients with type 2 diabetes in Turkey. A significant relationship was found between the diabetes burden and self-management levels and the spiritual well-being of patients with diabetes ($p < 0.005$). Multiple linear regression analyses found that a high diabetes burden (ß = −0.106) decreased well-being, and high self-management increased well-being (ß = 0.415). Additionally, the results revealed that marital status, household members, performing daily life activities alone, hospitalization due to complications, diabetes burden, self-management, glycemic control, and blood lipid parameters explained 29% of the total variance in the spiritual well-being level. Accordingly, the present study recommended that health professionals should consider spiritual well-being to support disease management with a holistic approach to diabetes patients.

Keywords Diabetes burden · Glycemic control · Self-management · Spiritual well-being · Type 2 diabetes

Introduction

While type 2 diabetes is an important health problem that threatens the independent life of the patient, it also creates an important burden in terms of mortality, morbidity, and health system costs worldwide (Hurst et al., 2020; International Diabetes Federation, 2021). The number of individuals with diabetes globally reached 463

✉ Selda Celik
selda.celik@sbu.edu.tr

Extended author information available on the last page of the article

Published online: 05 March 2023

million in 2018, and its prevalence increased to 9.3% (Hurst et al., 2020). This number is predicted to rise to approximately 643 million by 2030 and to 783 million by 2045 (International Diabetes Federation, 2021). The prevalence of diabetes in Turkey was 14.5% in 2021, and it is predicted to amount to %17.5% in 2045 (International Diabetes Federation, 2021).

The burden of disease refers to the patient's perceptions of the role of the disease process, including the tasks they need to perform to protect their health, and its effect on social, physical, and psychological functionality (Eton et al., 2013; Rogers et al., 2021). Diabetic patients have been reported to have difficulties in activities of daily living (ADLs), adherence to diet and physical activities, and oral antidiabetic or insulin treatment due to disorders in carbohydrate, lipid, and protein metabolisms and complications in the long and short-term (Güner et al., 2020; Rogers et al., 2021). In addition, diabetes causes emotional, mental, and social problems and conflicts as well as physiological changes in individuals (Güner et al., 2020).

The anxiety experienced, depression, stress, and the loss of social support have negative consequences on diabetes, exacerbating the condition and increasing the burden of the disease on the individual (Güner et al., 2020; Rogers et al., 2021). According to the results of the National Disease Burden Study conducted in Turkey, an increase of 60% was observed in the burden of diabetes-related diseases, and it was reported that diabetes ranked first among the diseases that cause burden (Güner et al., 2020). Regarding the literature, there is a relationship between age and diabetes burden, and the diabetes burden of patients with decreased functional capacity and comorbidities is high (Duke, 2021). On the other hand, a higher disease burden may be associated with higher HbA_{1c} levels and less adaptation to self-care activities (Eton et al., 2013).

With diabetes becoming increasingly widespread, it is essential for patients to improve their physical, psychological, and social well-being by gaining self-management behaviors (Duke, 2021). Self-management in diabetes is self-care behavior that ensures regular medicine use, routine health checks, medical nutrition treatment, and compliance with physical activity (Duke, 2021; Lin et al., 2017). Studies have shown that improving diabetes self-management is important in achieving better health outcomes and reducing the incidence of complications (Duke, 2021; Houle et al., 2015; Lin et al., 2017). However, despite this strong relationship between better metabolic control along with the prevention of acute and chronic complications and self-management, diabetic patients often have poor long-term self-management skills (Hurst et al., 2020; Lin et al., 2017). Therefore, it is noteworthy that self-management is a complex behavioral process that is associated with numerous factors, including patient characteristics, and a combination of personal, behavioral, spiritual, and religious beliefs (Duke, 2021; Kaya & Caydam, 2019).

Spirituality is an important dimension of health and entails focusing on health and disease behaviors, strengthening adaptation to the disease process, gaining skills to overcome problems, increasing the power of healing and hope, and the interrelationship between the individual and the environment (Jafari et al., 2014; Javanmardifard et al., 2020; Koenig, 2015; Osarrodi et al., 2012). Studies have reported that many individuals turn to spiritual belief to cope with the disease or the challenging processes, and experiencing high spirituality increases mental well-being

(Javanmardifard et al., 2020; Koenig, 2015; Osarrodi et al., 2012). In diabetic patients, the importance of spirituality in coping with emotional burdens such as fatigue, fear, and anxiety and in providing glycemic control has been emphasized (Gergianaki et al., 2019; Koenig, 2015; Zareipour et al., 2016). Nevertheless, spiritual well-being is determined to be moderate in individuals with type 2 diabetes, and there is a negative relationship with adherence to treatment (Javanmardifard et al., 2020).

It seems clear that spiritual well-being in individuals with type 2 diabetes emerges as a concept related to self-management skills, adaptation to the treatment process, and coping with the physical and psychological burden of the disease. To the best of our knowledge, no studies have examined the relationship simultaneously between the burden of diabetes, self-management, and spiritual well-being among diabetes patients. This study aims at filling this literature gap by comparing the levels of the diabetes burden, self-management, and spiritual well-being in diabetic patients and showing the relationship between these three variables. The findings of this study will provide insight to healthcare professionals on how to support the spiritual well-being of diabetes patients effectively.

Method

Aims of the Study

The hypothesis of this correlational study is "There is a relationship between spiritual well-being, perceived diabetes burden, and self-management among type-2 diabetic patients". Additionally, this study aimed to respond to the following research questions:

(i) What are the level of spiritual well-being, perceived diabetes burden, and self-management among type-2 diabetic patients?
(ii) Does the patients' characteristics, diabetes burden, and self-management affect the spiritual well-being of type-2 diabetic patients?

Sample of the Study

This study was conducted in a cross-sectional, descriptive, and correlational design. The population of this study consisted of individuals who were admitted to the diabetes training outpatient clinic of a state hospital between October 2021 and September 2022 and who were treated and followed up due to type 2 diabetes diagnosis. The eligibility criteria for individuals in this study consisted of (a) being diagnosed with type 2 diabetes at least 6 months ago, (b) being over 18 years of age, (c) being literate, (d) being able to communicate verbally, and (e) voluntarily participating in the study.

The sample size was calculated using G*Power 3.1.9.7 at the beginning of the study, and the size was planned to consist of at least 270 participants with 0.80

power and an alpha value of 0.05. The type 2 diabetes patients ($n=450$) were evaluated in terms of the eligibility criteria, and a total of 150 patients were not included in the study because they were illiterate ($n=16$), the duration since diabetes diagnosis was less than 6 months ($n=45$), they were under the age of 18 ($n=24$), they had current psychotic attacks or dementia ($n=7$), or they refused to participate ($n=58$). The finalized study sample incorporated 300 type 2 diabetes patients.

Data Collection Tools

The data of the study were collected using the "Patient Diagnosis Form", "Diabetes Burden Scale," "Diabetes Self-Management Scale (DSMQ)," and the "Spiritual Well-Being Scale (FACIT-Sp-12)." It took approximately 20–25 min to complete the forms. The data were collected by the researchers through face-to-face interviews.

Patient Diagnosis Form The patient diagnosis form, which consisted of 20 questions, was created by the researchers in line with the literature. Sociodemographic characteristics and information about the diagnosis and treatment of the disease were included in the form (Lin et al., 2017; Güner et al., 2020). Fasting and postprandial blood glucose levels, metabolic parameters of HbA_{1c}, and blood lipid profiles were obtained from the laboratory result documents with the approval of the individual after the measurements requested by the physician at the time of admission to the outpatient clinic.

Diabetes Burden Scale This scale is a 22-item Likert-type scale developed by Araki and Ito (2003) in Japan to measure the diabetes burden of elderly people with diabetes. The scale consists of six subfactors: symptom burden (four items), social burden (five items), dietary restrictions burden (four items), burden due to anxiety about diabetes (four items), burden related to treatment dissatisfaction (three items), and burden due to oral antidiabetic or insulin (three items) (Araki & Ito, 2003). The validity and reliability study of the scale for Turkey was conducted by Usta and Esen (2012). The Cronbach's alpha coefficient of the whole scale was found to be 0.92 (Usta & Esen, 2012). The total score range of the scale is 18–88. The increase in scale scores indicates an increase in the burden in the relevant factor, while the decrease in scores indicates a decrease in the burden in the related area (Araki & Ito, 2003; Usta & Esen, 2012). In this study, the Cronbach's alpha value of the scale was found to be 0.89.

Diabetes Self-Management Questionnaire (DSMQ) This scale was developed by Schmitt et al. (20,139 to examine the relationship between diabetes self-management and glycemic control in diabetic patients and consists of 16 items. In the validity and reliability study, the Cronbach's alpha value was found to be 0.84 (Schmitt et al., 2013). The scale consists of four subdimensions (glucose management, diet control, physical activity, and health care use) (Eroglu & Sabuncu, 2018; Schmitt et al., 2013). A minimum of 0 and a maximum of 10 points are obtainable from the scale. Diabetes self-management increases as the score approaches 10 (Eroglu & Sabuncu,

2018; Schmitt et al., 2013). In this study, the DSMQ Cronbach's alpha value was found to be 0.78.

Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being Scale (FACIT-Sp-12) The Spiritual Well-Being Scale is a 12-item scale developed by Bredle et al. (2011). The scale, whose validity and reliability study was conducted by Ay et al. (2019) in Turkish, is a 5-point Likert-type scale ranging from the answers "1-strongly disagree" to "5-strongly agree." The scale consists of two subdimensions. The first eight questions of the scale are examined in the subdimension of 'mental well-being,' and the last four questions are examined in the subdimension of 'spiritual well-being' (Ay et al., 2018; Bredle et al., 2011). In the mental well-being category of the scale, 32 is the highest score that patients can obtain (Ay et al., 2018; Bredle et al., 2011). This score indicates that the mental well-being of the patients is high. The lowest score is 0, and lower scores imply decreased mental well-being. Regarding the spiritual well-being category, the highest score that can be obtained from the last four items is 16, while the lowest score is 0. A high score means that the patient's spiritual well-being is increased, whereas a low score indicates a low spiritual well-being for the patient. These two categories constitute the spiritual well-being score (Ay et al., 2018; Bredle et al., 2011). In this study, the Cronbach's alpha value of the Spiritual Well-Being Scale was determined as 0.83.

Ethical Considerations

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Hamidiye Scientific Research Ethics Committee of the University of Health Sciences (Date: 4.06.2021 /No: 21/437). Written and verbal consent was obtained from the individuals who agreed to participate in the study by informing them about the objectives, methods, and expected benefits of the research. During the data collection phase, the patients were explained that they could withdraw from the study at any time without giving any reasons. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was used to report the study (Kottnerus & Tugwell, 2008).

Data Analysis

All data were analyzed using SPSS 23.0 (IBM Corp., Chicago, IL, USA). Frequency and percentage analyses were employed to determine the descriptive characteristics of the patients participating in the study and mean and standard deviation statistics were used to examine the scale data. Considering kurtosis and skewness values, research variables showed normal distribution. Parametric methods were used in the analysis of the data. In comparing the differences in the patients' scale scores according to the descriptive characteristics, the T-test

was used to compare two groups, and one-way analysis of variance (ANOVA), and post hoc (Tukey, LSD) tests were used to compare more than two groups. The relationships between continuous variables and well-being scores were tested with Pearson correlation analysis. Multivariate linear regression analysis was performed to determine the factors affecting spiritual well-being. A value of $p < 0.05$ was considered statistically significant.

Results

The mean age of the patients participating in the study was 58.75 ± 9.79 years. It was determined that 54.7% of the patients were female, 44.0% were primary school graduates, 81.3% were married, and 90.7% lived with their spouses or children. Most of the patients did not work (70.3%), and their income was less than their expenses (51.0%). According to the smoking status, 70.7% of the patients did not smoke, and 95.0% did not use alcohol. In terms of diabetes treatment, the majority of the patients used insulin (62.7%), and the diagnosis was made 5–10 years ago (35.7%). It was found that 64.7% of the participants had diabetes in the family, and 61.7% had an additional chronic disease. Forty-one percent of the patients had previously received diabetes education, and 92.7% were able to perform ADLs alone. In addition, 48.7% evaluated their health as poor, while 19% were hospitalized due to diabetes complications over the past year (Table 1).

The results of the disease-related characteristics of the participants revealed that the mean fasting blood sugar (FBS) level was 179.07 ± 72.61 mg/dl, the mean postprandial blood sugar (PBS) was 246.18 ± 92.61 mg/dl, and the mean HbA_{1c} level was 9.24 ± 2.78%. As regards the lipid profile, the mean triglyceride level was 189.84 ± 84.78 mg/dl, the total cholesterol level was 191.75 ± 43.50 mg/dl, and the body mass index (BMI) was 29.88 ± 5.99 kg/m^2 (Table 1).

According to the results, the mean diabetes burden score of the patients was 49.65 ± 12.00, the mean self-management score was 4.69 ± 1.27, and the mean spiritual well-being score was 31.66 ± 6.90 (Table 2).

It was found that there was a statistically significant relationship between the mean FACIT-Sp-12 score and marital status ($t = -2.488$, $p = 0.013$), household members ($t = 2.924$, $p = 0.004$), performing ADLs alone ($t = -2.310$, $p = 0.022$), and hospitalization in the last year due to complications ($t = 3.531$, $p < 0.001$). Accordingly, the FACIT-Sp-12 total scores of those who were married, living with a spouse or child, those who could perform ADLs alone, and those who were not hospitalized within the past year due to diabetes complications were found to be higher ($p < 0.05$) (Table 3).

A negative and very weak relationship was found between the diabetes burden level and spiritual well-being of individuals with diabetes ($r = -0.237$, $p < 0.001$), and a positive and weak relationship was found between self-management levels and spiritual well-being ($r = 0.479$, $p < 0.001$). In addition, it was determined that there was a negative relationship between FBS, PBS, HbA_{1c}, triglyceride, total cholesterol, and low-density lipoprotein (LDL) levels and the FACIT-Sp-12 score

Table 1 Sociodemographic and disease-related characteristics of the patients (n = 300)

Characteristics	n	%
Age (year) (X ± SD)	58.75 ± 9.79	
FBS level (mg/dl)	17.07 ± 72.61 (min = 78, max = 570)	
PBS level (mg/dl)	246.18 ± 92.61 (min = 105, max = 600)	
HbA_{1c} (%)	9.24 ± 2.78 (min = 4.50, max = 17.70)	
Triglyceride (mg/dl)	189.84 ± 84.78 (min = 55, max = 602)	
Total cholesterol (mg/dl)	191.75 ± 43.50 (min = 92, max = 378)	
HDL (mg/dl)	46.15 ± 9.91 (min = 28, max = 140)	
LDL (mg/dl)	143.70 ± 41.16 (min = 17, max = 336)	
BMI (kg/m^2)	29.88 ± 5.99 (min = 19.37, max = 59.88)	
Gender		
Male	136	45.3
Female	164	54.7
Education level		
Primary school	132	44.0
Secondary school	91	30.3
High school	56	18.7
University and above	21	7.0
Marital status		
Single	56	18.7
Married	244	81.3
Working status		
Yes	89	29.7
No	211	70.3
Income level		
Low	153	51.0
Moderate	123	41.0
High	24	8.0
With whom does she/he live		
With a partner or child	272	90.7
Alone	28	9.3
Smoking status		
Smoker	88	29.3
Non-smoker	212	70.7
Alcohol use status		
User	15	5.0
Non-user	285	95.0
Type of treatment		
Diet and oral antidiabetic therapy	112	37.3
Insulin therapy	188	62.7
Diagnosis time		
1–5 years	69	23.0
5–10 years	107	35.7

Table 1 (continued)

Characteristics	n	%
10–15 years	70	23.3
15 years and above	54	18.0
Presence of diabetes in the family		
Yes	194	64.7
No	106	35.3
Presence of other chronic diseases		
Yes	185	61.7
No	115	38.3
Receiving training about the disease from a doctor or nurse		
Yes	123	41.0
No	177	59.0
Ability to perform DLA		
Yes	278	92.7
No	22	7.3
Overall health assessment		
Good	39	13.0
Moderate	115	38.3
Bad	146	48.7
Hospitalization due to complications for the last year		
Yes	57	19.0
No	243	81.0

X = mean, SD = standard deviation, BMI = body mass index, DLA = daily life activities, FBS = fasting blood sugar, HDL = high-density lipoprotein, LDL = low-density lipoprotein, PBS = postprandial blood sugar

Table 2 Distribution of diabetic patients' mean scores in the FACIT-Sp-12, the Diabetes Burden Scale, and the DSMQ (n = 300)

Scales	X ± SD	Min–max scores obtained from this study	Min–max scores to be obtained
FACIT-Sp-12	31.66 ± 6.90	4–48	0–48
Diabetes burden scale	49.65 ± 12.00	22–78	18–88
DSMQ	4.69 ± 1.27	1.89–7.29	0–10

X = mean, SD = standard deviation, DSMQ = diabetes self-management questionnaire, FACIT-Sp-12 = spiritual well-being scale

($p < 0.05$). On the other hand, no significant relationship was found between BMI levels and the spiritual well-being of individuals with diabetes ($p > 0.05$) (Table 4).

The multivariate regression analysis for determining the factors affecting the FACIT-Sp-12 score is presented in Table 5. The regression analysis conducted to determine the cause-and-effect relationship between marital status, household members, ADLs alone,

Table 3 The comparison of diabetic patients' individual, disease-related characteristics with their FACIT-Sp-12 mean scores (n = 300)

Characteristics	N	FACIT-Sp-12 X ± SD
Gender		
Male	136	31.125 ± 7.288
Female	164	32.104 ± 6.563
Test (t/*p*)		−1.223/0.222
Education level		
Primary school	132	31.530 ± 6.482
Secondary school	91	31.308 ± 6.482
High school	56	31.393 ± 7.908
University and above	21	34.714 ± 8.137
Test (F/*p*)		1.499/0.215
Marital status		
Single	56	29.607 ± 6.384
Married	244	32.131 ± 6.948
Test (t/*p*)		−2.488/**0.013***
Working status		
Yes	89	32.506 ± 7.781
No	211	31.303 ± 6.490
Test (t/*p*)		−1.379/0.169
Income level		
Low	153	31.333 ± 6.829
Moderate	123	31.529 ± 6.723
High	24	34.417 ± 7.967
Test (F/*p*)		2.121/0.122
With whom does she/he live?		
With a partner or child	272	32.029 ± 6.911
Alone	28	28.071 ± 5.850
Test (t/*p*)		2.924/**0.004***
Smoking status		
Smoker	88	31.511 ± 6.654
Non-smoker	212	31.722 ± 7.024
Test (t/*p*)		0.240/0.811
Alcohol use status		
User	15	33.933 ± 7.056
Non-user	285	31.540 ± 6.891
Test (t/*p*)		−1.309/0.191
Type of treatment		
Diet and oral antidiabetic therapy	112	32.607 ± 6.751
Insulin therapy	188	31.096 ± 6.955
Test (t/*p*)		1.841/0.067
Diagnosis time		
1–5 years	69	32.522 ± 6.532

Table 3 (continued)

Characteristics	N	FACIT-Sp-12 X ± SD
5–10 years	107	31.449 ± 7.519
10–15 years	70	32.214 ± 6.397
15 years and above	54	30.259 ± 6.676
Test (F/*p*)		1.286/0.279
Presence of diabetes in the family		
Yes	194	31.660 ± 6.875
No	106	31.660 ± 6.998
Test (t/*p*)		0.001/0.999
Presence of other chronic diseases		
Yes	185	31.535 ± 7.187
No	115	31.861 ± 6.456
Test (t/*p*)		0.397/0.685
Receiving training about the disease from a doctor or nurse		
Hayır	177	32.023 ± 6.897
Evet	123	31.138 ± 6.916
Test (t/*p*)		1.091/0.276
Ability to perform DLA		
Yes	278	31.917 ± 6.931
No	22	28.409 ± 5.795
Test (t/*p*)		−2.310/**0.022***
Hospitalization due to complications for the last year		
Yes	57	28.807 ± 6.238
No	243	32.329 ± 6.897
Test (t/*p*)		3.531/**0.000***

X = mean, SD = standard deviation, DLA = daily life activities, F = one-way Anova test, t = independent groups *t*-test

*$p < 0.005$

hospitalization due to diabetes complications, diabetes burden, self-management, FBS, PBS, HbA_{1c}, triglyceride, total cholesterol, LDL, and spiritual well-being was found to be significant ($F = 11.160$; $p < 0.05$). The total variance in the level of well-being was explained by 29% with marital status, household members, ADLs alone, hospitalization due to diabetes complications, diabetes burden, self-management, FBS, PBS, HbA_{1c}, triglycerides, total cholesterol, and LDL ($R^2 = 0.290$). Marital status, hospitalization due to complications, ADLs alone, FBS, PBS, HbA_{1c}, total cholesterol, and LDL levels did not affect well-being ($p > 0.05$). Living alone (ß = −2.855), a high diabetes burden (ß = −0.106), and a high triglyceride level (ß = −0.198) reduced well-being, while high self-management increased well-being (ß = 0.415).

Table 4 Correlation of diabetic patients' FACIT-Sp-12 scores and independent variables

Parameters	FACIT-Sp-12 X ± SD
Diabetes Burden Scale	r = −0.237; p = **0.000****
DSMQ	r = 0.479; p = **0.000****
Age (year)	r = −0.063; p = 0.275
FBS	r = −0.251; p = **0.000****
PBS	r = −0.217; p = **0.000****
HbA_{1c} (%)	r = −0.226; p = **0.000****
Triglyceride (mg/dl)	r = −0.276; p = **0.000****
Total cholesterol (mg/dl)	r = −0.135; p = **0.020***
HDL (mg/dl)	r = −0.087; p = 0.134*
LDL (mg/dl)	r = −0.134; p = **0.020***
BMI (kg/m^2)	r = −0.061; p = 0.295

X = mean, SD = standard deviation, BMI = body mass index, DSMQ = diabetes self-management questionnaire, FBS = fasting blood sugar, HDL = high-density lipoprotein, LDL = low-density lipoprotein, PBS = postprandial blood sugar

r: Pearson correlation analysis

*$p < 0.05$, **$p < 0.01$

Table 5 Regression analysis of some variables related to predicting spiritual well-being

Variables	B	SE	ß	t	p
Constant	23.231	3.420		6.792	0.000
Marital status	−0.197	1.089	−0.011	−0.181	0.856
With whom does she/he live	−2.855	1.453	−0.120	−1.966	**0.050***
Ability to perform ADL	2.559	1.432	0.097	1.787	0.075
Hospitalization due to complications for the last year	−1.581	0.946	−0.090	−1.672	0.096
Diabetes burden scale	−0.061	0.031	−0.106	−1.994	**0.047***
DSMQ	2.245	0.295	0.415	7.623	**0.000****
FBS	−0.002	0.011	−0.023	−0.211	0.833
PBS	0.004	0.009	0.054	0.455	0.649
HbA_{1c} (%)	−0.088	0.226	−0.035	−0.387	0.699
Triglyceride (mg/dl)	−0.016	0.005	−0.198	−3.334	**0.001****
Total cholesterol (mg/dl)	0.011	0.010	0.067	1.045	0.297
LDL (mg/dl)	0.004	0.011	0.022	0.343	0.732

DLA = daily life activities, DSMQ = diabetes self-management questionnaire, FBS = fasting blood sugar, LDL = low-density lipoprotein, PBS = postprandial blood sugar

$R = 0.564$, $R^2 = 0.290$, $F = 11.160$, $p = 0.000$, Durbin Watson value = 2.029

*$p < 0.05$, **$p < 0.01$

Discussion

As a global health problem that increases with advanced age, type 2 diabetes has a high mortality rate and many complication risks, creating a serious disease burden on individuals and requiring the adaptation to the treatment process and self-management behaviors (Charvat et al., 2015; Güner et al., 2020). Diabetes disrupts the patients' physical health and threatens their social, functional, and emotional well-being. These challenges cause patients to question themselves, their goals, and their meaning in life (Javanmardifard et al., 2020). Spiritual well-being, on the other hand, is essential in improving the physical, psychological, and social health of individuals, strengthening their adaptation, coping with the disease process, and improving the quality of life (Javanmardifard et al., 2020; Osarrodi et al., 2012). In this context, this study aimed to determine the level of the diabetes burden, self-management, and spiritual well-being of diabetic patients and to examine the relationship between these variables.

In patients with chronic diseases such as diabetes, spiritual well-being can create encouraging results such as life and disease management to overcome difficulties (Jafari et al., 2014). This study revealed that the spiritual well-being of individuals with diabetes was moderate. In accordance with the findings of this research, studies have reported that patients with type 2 diabetes have moderate spiritual well-being scores (Jafari et al., 2014; Javanmardifard et al., 2020). In their study in Iran, Zareipour et al. (2016) demonstrated that 43% of elderly individuals with diabetes had moderate spiritual health scores, and 57% had high scores. Another study conducted on the African American population with type 2 diabetes revealed that their spiritual/religious beliefs and practices were elevated (Watkins et al., 2013). Accordingly, the spiritual well-being of individuals with type-2 diabetes varied between moderate to high levels. This result may be due to differences in the individual's age, experiences during illness, perceived stress, psychological anxiety, and religious beliefs since spirituality is a multifaceted concept that brings together the individual's physical, mental, and social dimensions.

According to the results of the present study, there was no significant relationship between age, gender, education level, employment status, smoking and alcohol use, time since diagnosis, type of treatment, presence of comorbidities, and education for diabetes and spiritual well-being. In line with our findings, studies reported that there was no relationship between spiritual well-being, gender, education level, and economic status in diabetic individuals (Javanmardifard et al., 2020; Shahdadi et al., 2015). On the other hand, Zareipour et al. (2016) maintained that spiritual health had a significant relationship with gender, age, education level, profession, and economic status. The inconsistencies between findings can be associated with environmental, cultural, and religious differences, disease suffering levels, and the differences in treatment durations.

In this study, the diabetes patients who were married, who lived with their spouses or children, who were able to perform ADLs alone, and those who had not been hospitalized in the past year due to diabetes complications had higher levels of spiritual well-being. In addition, it was determined in the regression analysis that the

person who lived with the diabetic patient was an important predictor of the spiritual well-being level. This finding can be explained with the supportive relationship between married couples, the social support provided by living with spouses or children, and the spirituality of the diabetic individuals participating in the study. In the literature, it is noteworthy that there are a limited number of studies analyzing the relationship between social support and spirituality, including religious beliefs, in individuals with diabetes. However, it has been revealed that social support has a significant relationship with religiosity and spirituality in populations with other chronic diseases (Moxey et al., 2011; Sohail et al., 2020). In these studies, spirituality/religiosity was accepted as a representative of social support (Moxey et al., 2011; Sohail et al., 2020). In addition, good social interactions can help improve cohesion among patients and thus improve spiritual well-being.

On the other hand, it is crucial for individuals with chronic diseases to maintain their independence and live productively with their diseases (Choi & Hastings, 2019). However, no studies have been found examining the relationship between ADLs and spiritual well-being in individuals with diabetes in the literature. In a qualitative study, individuals with high levels of religious commitment stated that they turned to religious prayer practice to overcome diabetes, asked God for power, and their sense of self-confidence developed. As a result, they reported that their daily life skills were positively affected (Choi & Hastings, 2019). In addition, high levels of independence can improve spiritual well-being by positively affecting the process of making sense of life and coping with stress. In Arifin et al.'s (2020) study on individuals with type 2 diabetes, patients reported that they felt that the presence of the diabetes burden and the complications were the primary cause of their psychological fatigue. Patients with diabetes complications may feel helpless, which can negatively affect their mood and lead to a lack of hope and low spirituality.

The presence of diabetes symptoms, lifestyle changes, long-term treatment processes, the frequency of hospital appointments, and diabetes complications cause stress on individuals and increase the burden of the disease (Güner et al., 2020; Kaya & Caydam, 2019). The negative effect of the disease and the treatment burden on well-being in individuals with a chronic disease is associated with decreased adherence to treatment and worse health outcomes (Rogers et al., 2021). In the present study, it was observed that the diabetes-related burden in individuals with diabetes was moderate, which was a finding not inconsistent with other studies (Güner et al., 2020; Kaya & Caydam, 2019; Ovayolu et al., 2015). On the other hand, Kaya and Caydam (2019) stated that the symptom burden and the burden associated with oral antidiabetic and insulin therapy were higher in diabetic individuals. Studies have reported that as the duration since diabetes diagnosis increases, complications that may develop due to diabetes will also increase, and the burden of diabetes will augment (Altunoğlu et al., 2012; Güner et al., 2020).

Another important result of the present study is that a negative relationship was found between the diabetes burden score and spiritual well-being. In addition, the regression analysis revealed that the diabetes burden of the patients was an important predictor of the spiritual well-being level, and a high diabetes burden decreased spiritual well-being. No studies have been found in the literature examining the relationship between diabetes burden and spiritual well-being. Nevertheless, studies

have emphasized the importance of spirituality as an internal coping strategy and that distress in diabetic patients occurs due to emotional burdens, such as disease burden, diabetes-related fatigue, fear, and anxiety (Gergianaki et al., 2019; Koenig, 2015). Previous studies on individuals with different chronic diseases have also suggested that increasing spiritual well-being can help improve patients' physical, mental, and social status by encouraging them to cope with diseases (Gergianaki et al., 2019; Koenig, 2015). It is stated that there is a strong positive correlation between spirituality and coping with the burden of chronic diseases (Arifin et al., 2020). Similarly, Hasegawa et al. (2017) reported that higher spiritual well-being was strongly associated with decreased symptom burden. In this sense, our findings support the negative relationship between spiritual well-being and diabetes burden. In fact, the symptoms, treatment, and social burden caused by diabetes may have negatively affected spirituality due to increased psychological distress, making it difficult to make sense of life and cope with the disease process.

The sense of meaning in life forms the basis of spiritual well-being, helps patients cope, reshapes their lives, and strengthens their disease management (Darvyri et al., 2018). The current study found a positive relationship between diabetes self-management and spiritual well-being. Furthermore, the regression analysis conducted in this study revealed that self-management was an important predictor of spiritual well-being and that high self-management increased well-being. In the literature, the importance of addressing spirituality in diabetes management was stated in various studies. Watkins et al. (2013) stated that performing and maintaining self-care behaviors effectively is substantial in preventing diabetes complications and in improving physical and psychological well-being. Consistent with our findings, previous studies on the African American population have shown a positive relationship between spiritual well-being and coping with diabetes, glycemic control, and self-management (Jafari et al., 2014; Newlin et al., 2008). In their study, Jafari et al. (2014) determined that the diabetes-controlled group ($HbA_{1c} < 7$) had a better quality of life and mental well-being than the uncontrolled group ($HbA_{1c} > 7$). A qualitative study on women with type 2 diabetes showed that the effect of spirituality on patients' self-management resulted in diabetes control (Samuel-Hodge et al., 2000). Similarly, the results of a systematic review showed that spiritual and religious beliefs are associated with adherence to drug regimens (Darvyri et al., 2018). These findings suggest that the feeling of inner peace and inner strength may protect against negative emotions and possibly lead to the maintenance of higher self-care behaviors in diabetic patients.

On the other hand, Javanmardifard et al. (2020) reported that spiritual well-being in individuals with diabetes is negatively related to adherence to the treatment regimen. Similar results were obtained by Duke (2021), who showed that although spirituality was compatible with the chronic condition of the disease, self-care behaviors were not accompanied and glycemic controls were low, and the participants believed that God's will would protect them from the disease. In this respect, successful diabetes control may be attributed to spirituality and the indirect effects of religious beliefs such as not smoking, not drinking alcohol, exercising, and following appropriate diets.

Spirituality can help diabetic individuals accept their self-management responsibilities and improve glycemic control by providing them with the power and support to make the right decisions about disease management (Casarez et al., 2010; Jafari et al., 2014). However, spirituality and religious beliefs do not always show a positive relationship with health outcomes (Cummings & Pargament, 2010). In this study, a negative relationship was found between FBG, PBG, HbA1c, triglyceride, total cholesterol, LDL levels, and spiritual well-being. As a result of the regression analysis, it was determined that the triglyceride level was an important predictor of spiritual well-being. In line with our study, Julianne Holt-Lunstad et al. (2011) reported that higher spiritual well-being was associated with marginally lower triglyceride levels and lower fasting glucose, albeit not significantly associated with cholesterol. Zareipour et al. (2016) stated in their study that there was a negative relationship between spiritual health and blood glucose control, although not significant, and blood glucose levels decreased as the spiritual health of the elderly diabetic individuals increased. In another study, it was reported that there was no significant relationship between religiosity/spirituality and triglyceride, fasting glucose, or cholesterol levels (Brintz et al., 2017). On the other hand, the results of the study conducted by How et al. (2011) showed that Muslims have higher HBA_{1c} and FBS levels. In this context, Bodenheimer et al (2002) stated that Muslims relied on Allah, and therefore, did not have appropriate control over their diseases. However, despite high BMI and irregular sports activities, HBA_{1c} levels were found to be low in other Muslim groups with high spirituality (Javanmardifard et al., 2020). Furthermore, Shahdadi et al. (2015) stated that there was no significant relationship between mental well-being and blood glucose control as a result of compliance with the treatment regimen. The inconsistency between the findings can be attributed to cultural, environmental, and religious differences, as well as differences in the treatment burden, chronic stress caused by the disease process, fatigue, psychological effects of diabetes on patients, and mental well-being. To conclude, according to the information in the literature and the findings of this study, more studies are needed to determine the factors that may predict the level of spiritual well-being in diabetic patients.

Limitations

There are some limitations to the current study. Since the study was conducted with diabetic individuals who applied to a single hospital at a certain time and agreed to participate in the study, the results of the research may not be generalizable. Second, information about spiritual well-being, diabetes burden, and self-management were based on individuals' reports. Another limitation is that since the patients were not followed up longitudinally, the relationship of spiritual well-being, diabetes burden, and self-management levels with the disease process could not be investigated in depth. However, this is the first study in Turkey to question the relationship between spiritual well-being in diabetic patients and their diabetes burden and self-management levels. It is expected to shed light on approaches that will strengthen spiritual well-being in supporting the adaptation process of patients to diabetes self-management behaviors and in reducing the burden of diabetes.

Conclusion

In this study, it was found that there was a significant relationship between the spiritual well-being of individuals with type 2 diabetes and the burden of diabetes and self-management behaviors. While a high diabetes burden reduces well-being, high self-management increases it. Further, it was determined that individuals with poor glycemic control parameters and lipid profile levels had higher spiritual well-being. Considering these results, it is recommended that health professionals provide care to individuals with diabetes with a holistic care approach and raise awareness about the positive effects of spiritual well-being on disease management. Healthcare professionals might be encouraged to provide spirituality-based care and counseling to support patients' well-being and adaptation to this life-threatening disease. Lastly, further studies on diabetic patient populations with larger samples are suggested to assess the factors that might predict the spiritual well-being level of patients.

Author Contributions All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by MGE, SC, MC, BY, and FCO. The first draft of the manuscript was written by MGE and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript. Conceptualization: MGE, SC, MC, BY, and FCO; methodology: MGE, SC, MC, BY; formal analysis and investigation: MGE, FCO; writing—original draft preparation: MGE; writing—review and editing: MGE, SC; supervision: SC.

Funding This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Declarations

Conflict of interest The authors declare that there is no conflict of interest.

Ethics Approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Hamidiye Scientific Research Ethics Committee of the University of Health Sciences University, Turkey (Date: 4.06.2021 /No: 21/437).

Consent to Participate Informed consent was obtained from all individual participants included in the study.

References

Altunoğlu, E. G., Sarı, Z., Erdenen, F., Müderrisoğlu, C., Ülgen, E., & Sarı, M. (2012). Tip 2 diabetes mellitus'lu hastalarda diyabet süresi ve HBA_{1C} düzeyleri ile depresyon, anksiyete ve yeti yitimi arasındaki ilişki. *Istanbul Medical Journal, 13*(3), 115–119. https://doi.org/10.5505/1304.8503.2012.29200

Araki, A., & Ito, H. (2003). Development of elderly diabetes burden scale for elderly patients with diabetes mellitus. *Geriatrics and Gerontology International, 3*(4), 212–224. https://doi.org/10.1111/j.1444-1586.2003.00084.x

Arifin, B., Probandari, A., Purba, A. K. R., Perwitasari, D. A., Schuiling-Veninga, C., Atthobari, J., Krabbe, P., & Postma, M. J. (2020). 'Diabetes is a gift from God to a qualitative study coping with diabetes distress by Indonesian outpatients. *Quality of Life Research, 29*(1), 109–125. https://doi.org/10.1007/s11136-019-02299-2

Ay, S., Gündüz, T., Özyurt, B. C., Çoban, A., & Pişkin, A. A. (2018). The psychometric properties of the Turkish version of the spiritual well-being scale (FACIT-Sp-12) in older adults living in nursing homes. *Anatolian Journal of Psychiatry, 19*, 22–28. https://doi.org/10.5455/apd.5670

Bodenheimer, T., Wagner, E. H., & Grumbach, K. (2002). Improving primary care for patients with chronic illness. *JAMA, 288*(14), 1775–1779. https://doi.org/10.1001/jama.288.15.1909

Bredle, J. M., Salsman, J. M., Debb, S. M., Arnold, B. J., & Cella, D. (2011). Spiritual well-being as a component of health-related quality of life: The functional assessment of chronic illness therapy-spiritual well-being scale (FACIT-Sp). *Religions, 2*(1), 77–94. https://doi.org/10.3390/rel2010077

Brintz, C. E., Birnbaum-Witzman, O., Llabre, M. M., Castañeda, S. F., Daviglus, M. L., Gallo, L. C., Giachello, L. A., Kim, S. R., Lopez, L., Teng, Y., & Penedo, F. J. (2017). Spiritual well-being, religious activity, and the metabolic syndrome: Results from the Hispanic community health study/study of Latinos sociocultural ancillary study. *Journal of Behavioral Medicine, 40*(6), 902–912. https://doi.org/10.1007/s10865-017-9858-7

Casarez, R. L. P., Engebretson, J. C., & Ostwald, S. K. (2010). Spiritual practices in self-management of diabetes in African Americans. *Holistic Nursing Practice, 24*(4), 227–237. https://doi.org/10.1097/HNP.0b013e3181e903c6

Charvat, H., Goto, A., Goto, M., Inoue, M., Heianza, Y., Arase, Y., Sone, H., Nakagami, T., Song, X., Qiao, Q., Tuomilehto, J., Tsugane, S., Noda, M., & Inoue, M. (2015). Impact of population aging on trends in diabetes prevalence: A meta-regression analysis of 160,000 Japanese adults. *Journal of Diabetes Investigation, 6*(5), 533–542. https://doi.org/10.1111/jdi.12333

Choi, S. A., & Hastings, J. F. (2019). Religion, spirituality, coping, and resilience among African Americans with diabetes. *Journal of Religion and Spirituality in Social Work: Social Thought, 38*(1), 93–114. https://doi.org/10.1080/15426432.2018.1524735

Cummings, J. P., & Pargament, K. I. (2010). Medicine for the spirit: Religious coping in individuals with medical conditions. *Religions, 1*, 28–53. https://doi.org/10.3390/rel1010028

Darvyri, P., Christodoulakis, S., Galanakis, M., Avgoustidis, A. G., Thanopoulou, A., & Chrousos, G. P. (2018). On the role of spirituality and religiosity in type 2 diabetes mellitus management-A systematic review. *Psychology, 9*(4), 728–744. https://doi.org/10.4236/psych.2018.94046

Duke, N. (2021). Type 2 diabetes self-management: Spirituality, coping and responsibility. *Journal of Research in Nursing, 26*(8), 743–760. https://doi.org/10.1177/17449871211026958

Eroglu, N., & Sabuncu, N. (2018). Adaptation of diabetes self-management questionnaire to Turkish society: Validity and reliability study. *Journal of Nursing Science, 1*(3), 1–6.

Eton, D. T., Elraiyah, T. A., Yost, K. J., Ridgeway, J. L., Johnson, A., Egginton, J. S., Mullan, J. R., Murad, H. M., Erwin, J. P., & Montori, V. M. (2013). A systematic review of patient-reported measures of burden of treatment in three chronic diseases. *Patient Related Outcome Measures, 4*, 7. https://doi.org/10.2147/PROM.S44694

Gergianaki, I., Kampouraki, M., Williams, S., & Tsiligianni, I. (2019). Evaluating spirituality: Is there a beneficial role in the management of COPD? *NPJ Primary Care Respiratory Medicine, 29*, 1–5. https://doi.org/10.1038/s41533-019-0134-x

Güner, T. A., Bayraktaroğlu, T., & Seval, M. (2020). Yaşlı tip 2 diyabetli bireylerde diyabet yükünün incelenmesi: Zonguldak ili örneği. *Türkiye Diyabet Ve Obezite Dergisi, 4*(2), 108–118. https://doi.org/10.25048/tudod.723725

Hasegawa, T., Kawai, M., Kuzuya, N., Futamura, Y., Horiba, A., Ishiguro, T., Yoshida, T., Sawa, T., & Sugiyama, Y. (2017). Spiritual well-being and correlated factors in subjects with advanced COPD or lung cancer. *Respiratory Care, 62*(5), 544–549. https://doi.org/10.4187/respcare.05282

Holt-Lunstad, J., Steffen, P. R., Sandberg, J., & Jensen, B. (2011). Understanding the connection between spiritual well-being and physical health: An examination of ambulatory blood pressure, inflammation, blood lipids and fasting glucose. *Journal of Behavioral Medicine, 34*(6), 477–488. https://doi.org/10.1007/s10865-011-9343-7

Houle, J., Beaulieu, M. D., Chiasson, J. L., Lespérance, F., Côté, J., Strychar, I., Bherer, L., Meunier, S., & Lambert, J. (2015). Glycemic control and self-management behaviors in Type 2 diabetes: Results from a 1-year longitudinal cohort study. *Diabetic Medicine, 32*(9), 1247–1254. https://doi.org/10.1111/dme.12686

How, C. B., Ming, K. E., & Chin, C. Y. (2011). Does religious affiliation influence glycaemic control in primary care patients with type 2 diabetes mellitus? *Mental Health in Family Medicine, 8*(1), 21.

Hurst, C. P., Rakkapao, N., & Hay, K. (2020). Impact of diabetes self-management, diabetes management self-efficacy and diabetes knowledge on glycemic control in people with type 2 diabetes (T2D): A multicenter study in Thailand. *PLoS ONE, 15*(12), e0244692. https://doi.org/10.1371/journal.pone.0244692

International Diabetes Federation (2021). *Diabetes around the world in 2021*. Retrieved September 22, 2022, from https://diabetesatlas.org/

Jafari, N., Farajzadegan, Z., Loghmani, A., Majlesi, M., & Jafari, N. (2014). Spiritual well-being and quality of life of Iranian adults with type 2 diabetes. *Evidence-Based Complementary and Alternative Medicine, 2014*, 1–8. https://doi.org/10.1155/2014/619028

Javanmardifard, S., Heidari, S., Sanjari, M., Yazdanmehr, M., & Shirazi, F. (2020). The relationship between spiritual well-being and hope, and adherence to treatment regimen in patients with diabetes. *Journal of Diabetes and Metabolic Disorders, 19*(2), 941–950. https://doi.org/10.1007/s40200-020-00586-1

Kaya, U. P., & Caydam, O. D. (2019). Association between social support and diabetes burden among elderly patients with diabetes: A cross-sectional study from Turkey. *Saudi Journal of Medicine and Medical Sciences, 7*(2), 86. https://doi.org/10.4103/sjmms.sjmms_44_18

Koenig, H. G. (2015). Religion, spirituality, and health: A review and update. *Advances in Mind-Body Medicine, 29*(3), 19–26.

Kottnerus, A., & Tugwell, P. (2008). STROBE-a checklist to strengthen the reporting of observational studies in epidemiology. *Journal of Clinical Epidemiology, 61*(4), 323. https://doi.org/10.1016/j.jclinepi.2007.11.006

Lin, K., Park, C., Li, M., Wang, X., Li, X., Li, W., & Quinn, L. (2017). Effects of depression, diabetes distress, diabetes self-efficacy, and diabetes self-management on glycemic control among Chinese population with type 2 diabetes mellitus. *Diabetes Research and Clinical Practice, 131*, 179–186. https://doi.org/10.1016/j.diabres.2017.03.013

Moxey, A., McEvoy, M., Bowe, S., & Attia, J. (2011). Spirituality, religion, social support and health among older Australian adults. *Australasian Journal on Aging, 30*(2), 82–88. https://doi.org/10.1111/j.1741-6612.2010.00453.x

Newlin, K., Melkus, G. D., Tappen, R., Chyun, D., & Koenig, H. G. (2008). Relationships of religion and spirituality to glycemic control in Black women with type 2 diabetes. *Nursing Research, 57*(5), 331–339. https://doi.org/10.1097/01.NNR.0000313497.10154.66

Osarrodi, A. A., Golafshani, A., & Akaberi, S. A. (2012). Relationship between spiritual well-being and quality of life in nurses. *Journal of North Khorasan University of Medical Sciences, 3*(4), 79–88. https://doi.org/10.29252/jnkums.3.4.79

Ovayolu, Ö., Ovayolu, N., Doğru, A., & Özkaya, M. (2015). The challenge of diabetes in the elderly and affecting factors. *Holistic Nursing Practice, 29*(5), 272–279. https://doi.org/10.1097/HNP.0000000000000102

Rogers, E. A., Big Brother, H., Linzer, M., & Eton, D. T. (2021). Treatment burden in people with hypertension is correlated with patient experience with self-management. *The Journal of the American Board of Family Medicine, 34*(6), 1243–1245. https://doi.org/10.3122/jabfm.2021.06.210191

Samuel-Hodge, C. D., Headen, S. W., Skelly, A. H., Ingram, A. F., Keyserling, T. C., Jackson, E. J., Ammerman, A. S., & Elasy, T. A. (2000). Influences on day-to-day self-management of type 2 diabetes among African–American women: Spirituality, the multi-caregiver role, and other social context factors. *Diabetes Care, 23*(7), 928–933. https://doi.org/10.2337/diacare.23.7.928

Schmitt, A., Gahr, A., Hermanns, N., Kulzer, B., Huber, J., & Haak, T. (2013). The diabetes self-management questionnaire (DSMQ): Development and evaluation of an instrument to assess diabetes self-care activities associated with glycaemic control. *Health and Quality of Life Outcomes, 11*(1), 1–14. https://doi.org/10.1186/1477-7525-11-138

Shahdadi, H., Dindar, M., Mohammad, P. H. R., Sadegh, S., & Masinaeinezhad, N. (2015). The relationship between spiritual health and glycemic control in patients with type II diabetes. *Journal of Diabetes Nursing, 3*(2), 43–52.

Sohail, M. M., Mahmood, Q. K., Sher, F., Saud, M., & Mas 'udah, S., & Ida, R. (2020). Coping through religiosity, spirituality and social support among Muslim chronic hepatitis patients. *Journal of Religion and Health, 59*(6), 3126–3140. https://doi.org/10.1007/s10943-019-00909-4

Usta, Y. Y., & Esen, A. (2012). A study of the validity and reliability of the "Elderly Diabetes Burden Scale" for the Turkish society. *Turkish Journal of Geriatrics, 15*(1), 61–67.

Watkins, Y. J., Quinn, L. T., Ruggiero, L., Quinn, M. T., & Choi, Y. K. (2013). Spiritual and religious beliefs and practices and social support's relationship to diabetes self-care activities in African Americans. *The Diabetes Educator, 39*(2), 231–239. https://doi.org/10.1177/0145721713475843

Zareipour, M., Khazir, Z., Valizadeh, R., Mahmoodi, H., & Ghelichi Ghojogh, M. (2016). The association between spiritual health and blood sugar control in elderly patients with type 2 diabetes. *Elderly Health Journal, 2*(2), 67–72.

Authors and Affiliations

Merve Gulbahar Eren[1] · Selda Celik[2] · Melike Celik[3] · Burcu Yon[4] · Fatma Can Ozturk[5]

Merve Gulbahar Eren
gulbaharmerve@hotmail.com

Melike Celik
melike.celik@marmara.edu.tr

Burcu Yon
burcuyonn@gmail.com

Fatma Can Ozturk
canfatmaozturk@gmail.com

1 Internal Medicine Nursing Department, Faculty of Health Science, Sakarya University, Sakarya, Turkey

2 Hamidiye Faculty of Nursing, University of Health Sciences Turkey, Istanbul, Turkey

3 Internal Medicine Nursing Department, Faculty of Health Sciences, Marmara University, Istanbul, Turkey

4 Vocational School of Health Services, Düzce University, Düzce, Turkey

5 Sakarya Toyotasa Emergency Aid Hospital, Sakarya, Turkey