



Geliş Tarihi (Received):19.02.2026

Kabul Tarihi (Accepted):11.08.2026

Araştırma Makalesi / Original Research

Correlation Between Disease-Related Health Beliefs and Self-Care Management of Middle Age and Older Adults With Type 2 Diabetes Mellitus

Tip 2 Diabetes Mellituslu Orta Yaş ve Üzeri Bireylerde Hastalığa İlişkin Sağlık İnançları ile Öz Bakım Yönetimi Arasındaki Korelasyon

Günce ŞAYLAN¹



Asiye KARTAL²



¹Hemşire, Adnan Menderes University Faculty of Nursing Public Health Nursing, Aydın/Turkey

² Prof. Dr., Pamukkale University Faculty of Nursing Public Health Nursing, Denizli/Turkey

Yazışmadan sorumlu yazar: Günce Şaylan; guncesaylaan@gmail.com

Alıntı (Cite): Şaylan G. & Kartal A. Correlation Between Disease-Related Health Beliefs and Self-Care Management of Middle Age and Older Adults With Type 2 Diabetes Mellitus. YBH Dergisi. 2026;7(2):59-76

Abstract:

Aim: Type 2 diabetes mellitus (T2DM) considerably affects the quality of life in older adults, representing a major public health issue. This study examined the relationship between health beliefs and self-care management among middle age and older adults with T2DM.

Methods: A descriptive and cross-sectional design was used with 335 older adults diagnosed with T2DM. Data were collected using the Socio-Demographic and Disease-Related Questionnaire, the Health Belief Model Scale, and the Self-Care Management Scale for Chronic Diseases. Multiple linear regression analysis was performed to determine predictors of self-care management.

Results: The mean Health Belief Model Scale score was 3.26 ± 0.31 , indicating low health belief levels, while the mean Self-Care Management Scale score was 116.13 ± 21.95 , showing moderate self-care management. Health beliefs were identified as the strongest predictor of self-care management ($\beta = 0.60$, $p < 0.001$).

Conclusion: Elderly individuals with diabetes have inadequate health beliefs, which adversely affect self-care behaviors. Interventions that strengthen positive health beliefs may enhance self-care management and improve diabetes-related outcomes.

Key Words: Health belief; self-care management; type 2 diabetes.

Özet:

Amaç: Tip 2 diabetes mellitus (T2DM), yaşlı bireylerde yaşam kalitesini önemli ölçüde etkileyen ve önemli bir halk sağlığı sorunu oluşturan kronik bir hastalıktır. Bu çalışma, T2DM'li orta yaş ve üzeri yetişkinlerde sağlık inançları ile öz bakım yönetimi arasındaki ilişkiyi incelemeyi amaçlamıştır.

Yöntem: Tanımlayıcı ve kesitsel tasarımda yürütülen çalışmaya T2DM tanısı almış 335 yaşlı birey dahil edilmiştir. Veriler; Sosyo-Demografik ve Hastalığa İlişkin Bilgi Formu, Sağlık İnanç Modeli Ölçeği ve Kronik Hastalıklarda Öz Bakım Yönetimi Ölçeği kullanılarak toplanmıştır. Öz bakım yönetiminin yordayıcılarını belirlemek amacıyla çoklu doğrusal regresyon analizi yapılmıştır.

Bulgular: Sağlık İnanç Modeli Ölçeği toplam puan ortalaması $3,26 \pm 0,31$ olup sağlık inancı düzeyinin düşük olduğunu göstermektedir. Öz Bakım Yönetimi Ölçeği toplam puan ortalaması ise $116,13 \pm 21,95$ olup öz bakım yönetiminin orta düzeyde olduğunu göstermektedir. Sağlık inançları, öz bakım yönetiminin en güçlü yordayıcısı olarak belirlenmiştir ($\beta = 0,60$, $p < 0,001$).

Sonuç: Diyabetli yaşlı bireylerin sağlık inanç düzeyleri yetersiz olup bu durum öz bakım davranışlarını olumsuz etkilemektedir. Olumlu sağlık inançlarını güçlendirmeye yönelik müdahaleler, öz bakım yönetimini artırabilir ve diyabete bağlı sonuçların iyileştirilmesine katkı sağlayabilir.

Anahtar Kelimeler: Sağlık inancı; öz bakım yönetimi; tip 2 diyabet.

Introduction

There have been significant changes in the demographic structure of societies worldwide. Along with these demographic shifts, population density, growth rate, and age distribution have also changed. As a result, the proportion of older adults is steadily increasing, while the proportion of younger populations is declining (¹⁻³). The rise in the elderly population has led to an increased prevalence of chronic diseases, among which one of the most important is diabetes mellitus. Diabetes mellitus, recognized as one of the most serious global health threats, remains a leading cause of death in many countries. The number of individuals with diabetes was approximately 415 million in 2015 and is projected to reach 642 million by 2040 (⁴). Beyond its detrimental effects on individual health, diabetes imposes a substantial financial burden on both individuals and national healthcare systems (⁵). It is estimated that most countries allocate between 5% and 20% of their total healthcare expenditures to diabetes management (⁶).

Preventing acute and chronic complications among individuals with diabetes is crucial to reducing the burden of the disease on both individuals and society. Early diagnosis and the provision of appropriate care play key roles in effectively controlling the disease and preventing its progression (⁵). To achieve this, individuals with diabetes must engage in consistent self-care management activities aimed at preventing or delaying diabetes-related complications (⁴).

Previous studies have shown that effective self-care management not only enhances patients' and families' quality of life but also decreases mortality, reduces hospital readmissions, and consequently lowers healthcare costs (⁶⁻⁷). However, many individuals face various barriers that impede their ability to manage self-care effectively (⁸). One of the most critical factors influencing self-care management among patients with diabetes is their beliefs and attitudes toward the disease. Research indicates that, in addition to providing information, healthcare professionals must also consider patients' perceptions, beliefs, and attitudes in order to understand and influence health behaviors (⁵).

Health beliefs, reflecting individuals' perceptions and attitudes toward health and illness, play a central role in shaping behaviors that promote or protect health (⁹). Various theoretical models have been developed to explain health-related behaviors and promote positive health practices, one of the most prominent being the Health Belief Model (HBM) (¹⁰).

According to the Health Belief Model, individuals' engagement in health-promoting behaviors is influenced by their perceptions of susceptibility to a condition, its seriousness, the perceived benefits of taking action, and the perceived barriers to action. If individuals believe

that they are at risk, that the consequences of the condition are serious, and that preventive behaviors are beneficial and feasible, they are more likely to adopt health-promoting actions⁽¹¹⁾.

The literature suggests a strong association between the components of the Health Belief Model and self-care behaviors. For example, individuals with a higher perception of disease seriousness are more likely to engage in and maintain self-care behaviors. Similarly, reducing perceived barriers facilitates regular and effective self-care practices ⁽⁵⁾. Studies on patients with diabetes have shown that individuals with higher perceived susceptibility achieve better glycemic control ⁽¹²⁾, perform foot care more effectively ⁽¹³⁾, and adhere more closely to recommended treatments. In addition, Shamsi et al. ⁽¹⁴⁾ found that an increase in perceived susceptibility enhanced exercise behaviors such as walking among patients. These findings highlight the crucial role of health beliefs in promoting self-care management among individuals with diabetes.

Positive health beliefs and attitudes toward the disease become even more critical in old age. During this period, several factors—including the tendency to accept symptoms as part of normal aging, decreased awareness of health problems, denial of existing symptoms, lower education levels, difficulties in expressing complaints, limited access to healthcare services, and inadequate attention from healthcare professionals—make diabetes management more challenging among older adults ⁽¹⁵⁾. Furthermore, physiological, psychological, sociocultural, and economic changes associated with aging complicate the self-management of chronic diseases ⁽¹⁶⁾. Considering that older adults may find it more difficult to modify their lifestyles and health behaviors due to age-related changes, evaluating their health beliefs and self-care management practices is of great importance. Nevertheless, research on this topic among elderly populations remains limited, and studies specifically examining the effect of health beliefs on self-care management in older adults are scarce.

Materials and Methods

Aim

This study aimed to examine the relationship between health beliefs and self-care management among middle age and older adults with type 2 diabetes mellitus (T2DM).

Design

A descriptive, cross-sectional study design was employed.

Setting and Participants

The study was carried out in the Denizli province of western Turkey, focusing on urban districts where primary healthcare services are delivered through Community Health Centres (CHCs). Before the data collection phase, six primary healthcare centres were randomly selected from the CHCs located in the region. The required sample size was computed using the correlation point-biserial model t-test with the G*Power 3.0.10 software. As no previous research had investigated this topic, the sample size estimation was based on an assumed small effect size ($r = 0.15$) representing the expected correlation between disease-related health beliefs and self-care management. With a 95% confidence interval and a statistical power of 80%, the minimum number of participants required was calculated to be 270.

Ultimately, 335 elderly individuals with T2DM who visited the selected centres during the study period and consented to participate were recruited through convenience sampling. The inclusion criteria were as follows: (a) being aged 60 years or older, (b) having a medical diagnosis of T2DM for at least six months, (c) literacy in Turkish, and (d) being an active registrant at one of the selected healthcare facilities. Individuals with severe chronic complications such as visual or auditory impairments or a history of stroke were excluded. Data collection was performed by the researcher through structured, face-to-face interviews.

Instruments

Sociodemographic and Disease Information Form

This form was designed to collect data on participants' sociodemographic and clinical characteristics. It included questions regarding gender, age, marital status, educational attainment, income level, and health insurance coverage. In addition, it addressed diabetes-related factors such as disease duration, treatment modality, adherence to prescribed therapy, exercise routines, blood glucose monitoring habits, diabetes education history, presence of comorbid chronic conditions, and any previous hospitalizations related to the illness.

Health Belief Model Scale

The Health Belief Model (HBM) Scale, originally adapted by Tan (¹⁷) based on the five constructs of the HBM proposed by Schwab et al., measures the beliefs and attitudes of individuals with diabetes toward health and illness. The instrument evaluates perceived susceptibility (5 items), perceived seriousness (3 items), perceived benefits (7 items), perceived barriers (11 items), and engagement in recommended health behaviours (10 items), comprising a total of 36 items.

Responses are provided on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Mean scores of 4.0 or higher reflect strong health beliefs, while scores

below 4.0 indicate lower health belief levels (¹⁷). The Turkish adaptation and psychometric evaluation were carried out by Kartal and Özsoy (¹⁸) in individuals with type 2 diabetes, yielding a Cronbach's alpha coefficient of 0.89, confirming high internal consistency. In the present study, Cronbach's alpha of the scale was found to be 0.84.

Self-Care Management Scale

The Self-Care Management Process-General (SCMP-G) Scale was developed following the conceptualization of the self-care management process by Jones and Preuett (1986), later refined to include protective behaviours. The scale encompasses two subdimensions—self-protection and social protection. Items numbered 2, 6, 8, 11, 15, 18–20, 22–23, and 25–34 assess self-protection, while items 1, 3–5, 7, 9–10, 12–14, 16–17, 21, 24, and 35 evaluate social protection.

Each statement is rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Items 3, 15, 19, and 28 are reverse-coded. The minimum possible score that can be obtained from the scale is 35, and the maximum possible score is 175. In the SCMP-G scale, higher scores indicate better self-care management. Higher total scores denote stronger self-care management skills. The SCMP-G can be administered individually or in small groups and typically requires 15–20 minutes to complete. In the original version, the overall Cronbach's alpha was 0.75, with 0.78 for both the self-protection and social protection subscales (¹⁹).

The Turkish adaptation and validation were performed by Hançerlioğlu and Aykar (²⁰) for use in individuals with chronic illnesses. Their study examined linguistic equivalence and content validity, alongside reliability analyses including internal consistency, item–total correlation, and test–retest stability. Factor analysis confirmed the two-factor model of the scale. The Turkish version demonstrated a mean total score of 127.87 ± 17.07 , a Cronbach's alpha of 0.85, item–total correlation coefficients above 0.20, and a test–retest reliability coefficient of 0.97, indicating robust psychometric properties within Turkish populations. In the present study, Cronbach's alpha of the scale was found to be 0.91.

Analysis Method

Data collection was carried out between October and December 2019 through face-to-face interviews, each lasting approximately 20 minutes. Statistical analyses were performed using the IBM SPSS Statistics 23.0 software package. All analyses were interpreted within a 95% confidence interval. Descriptive statistics—such as frequencies, percentages, means, and standard deviations—were used to summarize the participants' sociodemographic and clinical

characteristics, as well as their scores on the Health Belief Model Scale and the Self-Care Management Scale. The relationship between health beliefs and self-care management was examined using Spearman's rank correlation coefficient.

It was determined that the data did not follow a normal distribution based on the Kolmogorov-Smirnov test ($p < 0.05$). Before conducting regression analysis, univariate analyses (Mann-Whitney U and Kruskal-Wallis tests) were applied to explore the associations between independent variables and self-care management. Variables that showed significant associations in the univariate analyses—including, age category, educational attainment, income level, comorbidity, diabetes treatment type, disease duration, treatment adherence, exercise behavior, and blood glucose monitoring—were entered into a multiple linear regression model together with the overall Health Belief Model Scale score. Subsequently, a backward multiple linear regression procedure was used to determine the most influential predictors of self-care management. Statistical significance was considered at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the University Non-Interventional Research Ethics Committee (Approval No: 60116787-020/85542). Permission to conduct the study in Family Health Centers was also granted by the Denizli Provincial Health Directorate and the physicians in charge of the selected facilities. All participants were informed in detail about the study's aims and procedures, and verbal informed consent was obtained before participation. Involvement in the study was entirely voluntary and limited to older adults who consented to take part. Furthermore, written authorization to use the measurement instruments was secured from the original developers of the relevant scales.

Results

Table 1. Distribution of Elderly Diabetics By Socio-Demographical And Disease-Related Characteristics

Variables	n	%
Gender		
Female	200	59.7
Male	135	40.3
Age Groups		
60-64 age group	215	64.2
65-69 age group	55	16.4
70-75 age group	35	10.4
76-79 age group	20	6.0
80 age and over	10	3.0
Marital Status		
Married	240	71.6
Single	95	28.4
Educational Status		
Illiterate	65	19.4
Literate	15	3.0
Primary school graduate	170	50.8
Secondary school graduate	5	1.5
High school graduate	50	14.9
University	35	10.4
Income status		
Low income	45	13.4
Balanced income	290	86.6
Health insurance		
No	40	11.9
Yes	295	88.1
Duration of diabetes		
Under a year	95	28.4
1-5 years	90	26.9
6-10 years	40	11.9
11 years and over	110	32.8
Type of diabetes treatment		
*OAD medicine treatment	175	52.3
Insulin treatment	5	1.5
Diet treatment	105	31.3
Exercises, diet and OAD treatment	50	14.9
Level of compliance with treatment		
Good	225	67.2
Middle	100	29.8
Poor	10	3.0
Exercise situation		
Yes	155	46.3
No	180	53.7
Blood glucose measuremen)		
Yes	215	64.2
No	120	35.8
Status of Receiving Education on Diabetes		
Yes	110	32.8
No	225	67.2
Having another chronic illness		
Yes	245	73.1
No	90	26.9
Hospitalization due to illness		
Yes	245	73.1
No	90	26.9
Total	335	100.0

*OAD: Oral Antidiabetic Drug

The majority of elderly individuals with diabetes (64.2%) were aged 60–64 years; 59.7% were female, 50.8% were primary school graduates, and 71.6% were married. Most participants (88.1%) had social security coverage, and 86.6% reported that their income was approximately equal to their expenses. Additionally, 32.8% had lived with diabetes for 11 years or longer, and 52.3% were treated with oral antidiabetic medications. Regarding disease management, 67.2% reported good adherence to treatment, more than half did not exercise regularly, 35.8% did not monitor their blood glucose, 67.2% had never received diabetes education, and 73.1% had at least one comorbid chronic disease. Furthermore, 73.1% had been hospitalized due to their illness.

Table 2. Mean Score Of Health Beliefs And Self Management

Health Belief Model Subscale	X	SD	Min-Max	Medyan
Perceived Sensitivity	3.05	± 0.37	2.25-5.00	3.00
Perceived Severity	3.79	± 0.85	2.00-5.00	4.00
Perceived Benefit	3.63	± 0.77	2.51-4.00	3.85
Perceived Barriers	2.36	± 1.01	1.90-5.00	3.70
Recommended Health Related Activities	3.47	± 0.85	3.24-4.89	2.11
Total HBMS	3.26	±0.31	3.89-5.00	4.00
Sub-Dimensions of Self-Care Management Scale				
Self Protection	69.16	±12.39	46.00-92.00	74.00
Social Protection	47.24	±10.80	26.00-66.00	53.00
Total Self-care Management Scale	116.13	±21.95	74.00-158.00	127.00
HBMS: Health Belief Model Scale X: mean SD: Standart deviation				

Table 2 presents the mean scores for the Health Belief Model (HBM) subdimensions and the Self-Care Management Scale. The mean score for perceived susceptibility was 3.05 ± 0.37 , for perceived seriousness 3.79 ± 0.85 , for perceived benefits 3.63 ± 0.77 , for perceived barriers 2.36 ± 1.01 , and for recommended health-related activities 3.47 ± 0.85 . Regarding self-care management, the mean score for self-protection was 69.16 ± 12.39 , for social protection 47.24 ± 10.80 , and the overall self-care management score was 116.13 ± 21.95 .

Table 3. Mean Self-Care Management Scale Scores By Participants' Demographic And Descriptive Characteristics.

Descriptive Characteristics of the Participants	Self-Care Management Scale Mean Score X±SS
Age	
60-65	116.18±22.70
66-70	111.00±20.57
71-75	120.00±18.19
76-80	132.33±3.41
81 years of age and older	105.50±27.93
Test Value	KW=15.74 p=0.00
Economic Situation	
Income Less Than Expenses	123.88±18.61
Income Equals Expenses	114.91±22.22
Test Value	KW=12.36 P=0.00
Diabetes Treatment Method	
Diet Only	121.90±18.77
Diet and Oral Antidiabetic Medication	112.14±23.09
Diet and Insulin	137.00±0.00
Diet, Oral Antidiabetic Medication, and Insulin	115.88±21.70
Test Value	KW=27.25 p=0.00
Duration of Oral Antidiabetic Drug Treatment	
Less than 1 year	100.66±21.99
1-5 years	109.30±26.44
6-10 years	116.00±17.16
11 years and over	114.78±23.46
Test Value	KW=10.07 p=0.01
Presence of Chronic Diseases Other Than Diabetes	
Yes	117.26±22.57
No	112.88±19.83
Test Value	U=8812.5 p=0.03
Treatment Adherence	
Very good	124.00±16.30
Good	117.10±20.69
Moderate	112.90±23.65
Poor	106.50±34.25
Test Value	KW=0.71 p=0.00
Blood Sugar Measurement Status	
Yes	119.50±19.94
No	110.25±24.06
Test Value	U=10900.0 p=0.04
Exercise Status	
Yes	124.70±16.59
No	109.00±23.32
Test Value	U=8650.0 p=0.00

Table 3 presents the comparison of Self-Care Management Scale mean scores according to the participants' descriptive characteristics. A statistically significant difference in self-care management scores was observed among the age groups ($KW = 15.74, p < 0.001$). The highest mean score was found in participants aged 76–80 years (132.33 ± 3.41), whereas the lowest mean score was observed among those aged 81 years and older (105.50 ± 27.93).

A significant difference in self-care management scores was also identified according to economic status ($KW = 12.36, p < 0.001$). Participants whose income was lower than their expenses had higher self-care management scores (123.88 ± 18.61) than those whose income was equal to their expenses (114.91 ± 22.22). Self-care management scores differed significantly according to diabetes treatment modality ($KW = 27.25, p < 0.001$). The highest mean score was observed among participants receiving both dietary treatment and insulin therapy (137.00 ± 0.00), while the lowest mean score was found among those receiving dietary treatment combined with oral antidiabetic medication (112.14 ± 23.09).

A statistically significant difference was also found according to the duration of oral antidiabetic medication use ($KW = 10.07, p = 0.01$). Participants who had been using oral antidiabetic medication for less than one year had the lowest self-care management score (100.66 ± 21.99), whereas those who had used oral antidiabetic medication for 6–10 years had the highest score (116.00 ± 17.16). Participants with an additional chronic disease had significantly higher self-care management scores (117.26 ± 22.57) than those without any other chronic disease (112.88 ± 19.83) ($U = 8812.5, p = 0.03$).

Self-care management scores also differed significantly according to treatment adherence ($KW = 0.71, p < 0.001$). Participants who reported very good treatment adherence had the highest mean self-care management score (124.00 ± 16.30), whereas those reporting poor adherence had the lowest mean score (106.50 ± 34.25). Participants who regularly monitored their blood glucose had significantly higher self-care management scores (119.50 ± 19.94) than those who did not monitor their blood glucose (110.25 ± 24.06) ($U = 10900.0, p = 0.04$). Finally, participants who engaged in regular exercise demonstrated significantly higher self-care management scores (124.70 ± 16.59) than those who did not exercise (109.00 ± 23.32) ($U = 8650.0, p < 0.001$).

Table 4 The Relationship Between Health Belief Model Scale Mean Scores And Self-Care Management Scale Mean Scores

Hbm Scale	Sub-Scales of Self Care Management Scale		
	Self Protection	Social Protection	Total Scale Score Average
Perceived Sensitivity	r = 0.175 p < 0.000	r = -0.005 p = 0.929	r = -0.096 p = 0.081
Perceived Severity	r = 0.568 p < 0.000	r = 0.385 p < 0.000	r = 0.446 p < 0.000
Perceived Benefit	r = 0.682 p < 0.000	r = 0.553 p < 0.000	r = 0.628 p < 0.000
Perceived Barriers	r = -0.555 p < 0.000	r = -0.551 p < 0.000	r = -0.561 p < 0.000
Recommended Health Related Activities	r = 0.529 p < 0.000	r = 0.430 p < 0.000	r = 0.475 p < 0.000
HBM Total Scale Score Average	r = 0.598 p < 0.000	r = 0.371 p < 0.000	r = 0.487 p < 0.000

There is a significant relationship between the “perceived susceptibility” subscale of the Health Belief Model Scale and only the “self-protection” subscale of the Self-Management Scale. In addition, there is a significant relationship between all subscales and the overall scale score of the Health Belief Model Scale and all subscales and the overall scale score of the Self-Care Management Scale(p<0.001).

Table 5. Predictors Affecting The Self Care Management According To Multiple Linear Regression Analysis

Variables	β	t	p	R ²
				0.47
HBMS	0.60	14.38	0.000*	
Income status	0.21	5.18	0.000*	
Duration of diabetes	-0.18	-4.44	0.000*	
Age group	-0.15	3.63	0.000*	
Education	0.14	3.22	0.001	
Comorbidity	-0.14	-3.32	0.001**	
Level of adherence to treatment	-0.13	-3.15	0.002**	

*the p value significance is <0.001,

** the p value significance is <0.01

Durbin Watson:1.63

R² coefficient of determinant

β =Standardized Coefficient

The multiple linear regression analysis revealed a positive and statistically significant standardized partial regression coefficient between overall health beliefs and overall self-care management ($\beta = 0.60$, $p < 0.001$). This indicates that improvements in patients' health beliefs were associated with higher self-care management scores. Significant predictors of self-care management included health beliefs ($\beta = 0.60$), income status ($\beta = 0.21$), duration of diabetes ($\beta = 0.18$), age group ($\beta = -0.15$), educational status ($\beta = 0.14$), comorbidity ($\beta = -0.14$), and treatment adherence ($\beta = -0.13$). Among these, health beliefs were the strongest predictor of self-care management. The model's explanatory power was $R^2 = 0.47$ (Table 5).

Discussion

With the increasing prevalence of chronic diseases, self-care management has become a critical component of diabetes care. Individual behaviors are shaped by health beliefs, which strongly influence motivation to adopt and maintain self-care practices ⁽²¹⁾. However, individuals often encounter barriers that hinder effective self-care. One of the most influential factors in this process is an individual's belief system regarding their illness. Therefore, this study primarily examined the health beliefs of elderly patients with type 2 diabetes.

In this study, the lowest mean score among HBM subdimensions was for perceived susceptibility (3.05 ± 0.37), and the highest was for perceived seriousness (3.79 ± 0.85). The overall mean health belief score (3.26 ± 0.31) was below four on a five-point scale, indicating low health belief levels ⁽¹⁷⁾. Previous research has similarly reported that elderly diabetic patients generally exhibit low ⁽²¹⁾ to moderate ⁽²²⁻²³⁻⁵⁻¹¹⁾ health beliefs regarding diabetes. These findings suggest that elderly individuals with diabetes tend to have limited or negative perceptions about their disease, potentially due to advanced age, long disease duration, inadequate disease knowledge, or multiple chronic comorbidities.

A previous study demonstrated that lower preventive behaviors were associated with low perceived susceptibility and perceived severity, as well as high perceived barriers ⁽³⁷⁾. Conversely, positive health beliefs are linked to improved glycemic control and healthier behaviors ⁽²¹⁾. These findings emphasize the importance of enhancing health beliefs to foster preventive behaviors in elderly diabetic populations.

Self-care management allows patients to maintain independence while reducing healthcare burdens ⁽²⁴⁾. In the present study, participants exhibited moderate levels of self-care management, consistent with previous reports ⁽²⁵⁻²⁶⁻²⁷⁾. Despite its importance, active engagement in self-care remains insufficient among elderly diabetics. Self-care is crucial to

improving quality of life and preventing diabetes-related complications affecting cardiovascular, renal, and nervous systems ⁽²⁸⁾. Therefore, identifying and addressing factors that influence self-care management is essential.

Health beliefs play a key role in promoting self care management behaviors. Therefore, the relationship between the health beliefs and self-care management of individuals with diabetes was first examined. The results of the correlation analysis showed that among the subdimensions of the Health Belief Model, perceived susceptibility was positively and weakly associated only with the self-protection subdimension, whereas no significant relationship was found with the social protection subdimension or the overall self-care management score. Furthermore, perceived severity, perceived benefits, and recommended health-related activities were found to be positively and significantly associated with self-care management. In contrast, the perceived barriers subdimension was significantly and negatively associated with self-care management. In addition, a moderate, positive, and statistically significant relationship was found between the overall health belief score related to the disease and the overall self-care management score. At the same time, Regression analysis revealed that health beliefs were the strongest predictor of self-care management ($\beta = 0.60$; $p < 0.001$), supporting the hypothesis that positive health beliefs enhance self-care management. Although limited studies have directly examined this relationship, existing evidence supports this finding. Kashfi et al. ⁽²⁹⁾ and Zhang et al. ⁽²¹⁾ reported that positive health beliefs improve self-efficacy and glycemic control in diabetic patients. Other research has shown associations between strong health beliefs and improved diabetic foot care ⁽³⁰⁾, increased glucose monitoring, and dietary adherence ⁽³¹⁾. Similar patterns have been observed across different cultural contexts, including Turkey ⁽³²⁾ and Sweden. Collectively, these findings underscore that fostering positive health beliefs is fundamental for promoting effective self-care management among elderly diabetic individuals.

Among other significant predictors, age was negatively correlated with self-care management ($\beta = -0.10$; $p < 0.03$), suggesting a decline in self-care ability with increasing age. Although nonmodifiable, age affects motivation and physical capacity for self-care. Similar results were reported in South Korea ⁽³³⁾ and in a systematic review by Zarei et al. ⁽²⁴⁾, highlighting the need for age-sensitive nursing interventions. Educational status also emerged as a significant factor, with higher education linked to better self-care behaviors. This is consistent with prior findings ⁽³⁴⁻²⁵⁻³⁵⁾, suggesting that education improves disease understanding and health literacy. Likewise, longer disease duration was positively associated with self-care management, possibly due to cumulative experience and repeated diabetes education ⁽²⁵⁾. Income status was another significant determinant—patients with higher income

demonstrated better self-care management, aligning with previous findings ⁽²⁴⁾. Treatment adherence and comorbidity were negatively correlated with self-care management. Poor adherence compromises disease control and increases the risk of complications ⁽³⁶⁾, while comorbid conditions reduce patients' capacity to perform self-care activities ⁽²⁴⁾.

Results and Recommendations

Assessing self-care management is a crucial aspect of diabetes care. The findings of this study revealed a moderate, positive, and statistically significant association between health beliefs and self-care management among middle-aged and older adults with type 2 diabetes. Furthermore, regression analysis showed that health beliefs are an important predictor of self-care management in this population. These findings suggest that interventions aimed at strengthening health beliefs may contribute to improving self-care management among individuals with type 2 diabetes. The findings provide a theoretical and practical foundation for designing interventions to strengthen health beliefs and thereby enhance self-care management in this population. Nurses play a pivotal role in supporting patients' self-care behaviors. Interventions such as group education, motivational counseling, individualized education, case management, and structured follow-up programs should be integrated into nursing practice to empower elderly patients in managing their diabetes effectively.

Limitation

This study has several limitations. First, participants were recruited through non-probability sampling from Family Health Centers within a single province, limiting the generalizability of the results. Second, the cross-sectional design provides only a snapshot of the relationships examined; thus, causality cannot be established. Future longitudinal studies involving larger, more diverse populations are recommended to validate these findings.

Conflict of Interests

No conflict of interest.

Source of Institutional and Financial Support

No specific funding was received for this research.

Author contributions

Data collection process (GŞ), Interpretation and organization of the data (AK, GŞ). Data organization and manuscript review (AK). Final Review Before Submission (AK, GŞ).

Acknowledgments

The authors would like to thank all individuals who contributed to the various stages of the study

REFERENCES

1. Ma Y, Zhang T, Qian W, et al. Financial development, demographic changes, and the growth of the non-hydro renewable energy industry: an empirical test based on R&D and financing costs. *Renew Energy*. 2022;185:217-229.
2. Akpansung A, Peter A. Demographic changes and economic growth of Sub-Saharan Africa: a system GMM approach. *KIU J Soc Sci*. 2021;7(3):65-74.
3. International Diabetes Federation. *Global guideline for type 2 diabetes*. Brussels: International Diabetes Federation; 2020.
4. Mikhael E, Hassali M, Hussain S. Effectiveness of diabetes self-management educational programs for type 2 diabetes mellitus patients in Middle East countries: a systematic review. *Diabetes Metab Syndr Obes*. 2020;13:117-138.
5. Shabbi B, Abedzadeh Zavareh MS, Sayehmiri K, et al. Effect of educational intervention based on the health belief model on promoting self-care behaviors of type 2 diabetes patients. *Electron Physician*. 2017;9(12):5960-5968.
6. Amer F, Mohamed M, Elbur A, et al. Influence of self-efficacy management on adherence to self-care activities and treatment outcomes among type 2 diabetes patients in Sudan. *Pharm Pract*. 2018;16(4):1274.
7. Uchmanowicz Z, Krzemińska S, Ausili D, et al. Polish adaptation of the Self-Care of Diabetes Inventory (SCODI). *Patient Prefer Adherence*. 2020;14:1341-1350.
8. Boussageon R, Gueyffier F, Cornu C. Effects of pharmacological treatments on micro- and macrovascular complications of type 2 diabetes: what is the level of evidence? *Diabetes Metab*. 2014;40(3):169-175.
9. Ünsal A. Hemşireliğin dört temel kavramı: insan, çevre, sağlık ve hastalık, hemşirelik. *Ahi Evran Univ Sağlık Bilim Derg*. 2017;1(1):11-28.
10. Champion VL, Skinner CS. The Health Belief Model. In: Glanz K, Rimer BK, Viswanath K, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. 4th ed. San Francisco: Jossey-Bass; 2008:45-62.
11. Rondhianto S. The effect of diabetes self-management education based on the health belief model on psychosocial outcomes of type 2 diabetic patients in Indonesia. *Indian J Public Health Res Dev*. 2018;9:11.
12. Pamungkas R, Chamroonsawasdi K, Vatanasomboon P, et al. Barriers to effective diabetes mellitus self-management in glycemic uncontrolled type 2 diabetes: a socio-cultural context of Indonesian communities in West Sulawesi. *Eur J Invest Health Psychol Educ*. 2020;10:250-261.
13. Jiang X, Wang J, Lu Y, et al. Self-efficacy-focused education in persons with diabetes: a systematic review and meta-analysis. *Psychol Res Behav Manag*. 2019;12:67-79.
14. Carbone C, Giuseppe M, Buono D, et al. Obesity, risk of diabetes and the role of physical activity, exercise training, and cardiorespiratory fitness. *Prog Cardiovasc Dis*. 2019;62(4):327-333.
15. Tewahido D, Berhane Y. Self-care practices among diabetes patients in Addis Ababa: a qualitative study. *PLoS One*. 2017;12(1):e0169062.
16. Kubat Bakır G, Akın S. Yaşlılıkta kronik hastalıkların yönetimi ile ilişkili faktörler. *Sağlık Toplum*. 2019;2:17-25.
17. Tan MY. The relationship of health beliefs and complication prevention behaviors of Chinese individuals with type 2 diabetes mellitus. *Diabetes Res Clin Pract*. 2004;66(1):71-77.

18. Kartal A, Özsoy AS. Tip 2 diyabetli hastalarda planlı eğitim programının sağlık inancına ve metabolik kontrole etkisi. *Hacettepe Univ Hemsire Fak Derg.* 2014;1-15.
19. Jones LC. Measuring guarding as a self-care management process in chronic illness: the SCMP-G. In: Strickland OL, DiIorio C, eds. *Measurement of Nursing Outcomes*. New York: Springer Publishing Company; 2001:150-158.
20. Hançerlioğlu S, Aykar FŞ. Validity and reliability of Turkish version of the Self-Care Management Process in Chronic Illness. *Gumus Univ Saglik Bilim Derg.* 2018;7(1):175-183.
21. Zhang A, Wang J, Wan X, et al. Mediation effect of self-efficacy between health beliefs and glycated haemoglobin levels in elderly patients with type 2 diabetes mellitus: a cross-sectional study. *Patient Prefer Adherence.* 2022;16:3015-3026.
22. Mohammadi S, Karim N, Talip R, et al. The impact of self-efficacy education based on the health belief model in Iranian patients with type 2 diabetes: a randomized controlled intervention study. *Asia Pac J Clin Nutr.* 2018;27(3):546-555.
23. Gadore T, Dea Y, Taddele B. Predictors of diabetes self-care practice and associated factors among patients on follow-up in Hadiya Zone, Southern Ethiopia: a cross-sectional study using the health belief model. *EC Endocrinol Metab Res.* 2019:1-17.
24. Zarei A, et al. Investigating the factors affecting self-care behaviors in diabetic patients: a systematic review. *J Biol Res.* 2022;95:10-26.
25. Gurmu Y, Gela D, Aga F. Factors associated with self-care practice among adult diabetes patients in West Shoa Zone, Oromia Regional State, Ethiopia. *BMC Health Serv Res.* 2018;18:1-8.
26. Gao J, Wang J, Zhu Y, Yu J. Validation of an information-motivation-behavioral skills model of self-care among Chinese adults with type 2 diabetes. *BMC Public Health.* 2013;13:2-6.
27. Ayele K, Tesfa B, Abebe L, et al. Self-care behavior among patients with diabetes in Harari, Eastern Ethiopia: the health belief model perspective. *PLoS One.* 2012;7(4):e35515.
28. Chaurasia N, Mishra R, Ling H, et al. A self-care management awareness study among diabetes mellitus patients in rural Nepal. *Am J Public Health Res.* 2015;3:67-71.
29. Kashfi SM, Khani Jeihooni A, Rezaianzadeh A, Amini S. The effect of a health belief model educational program and jogging on control of blood sugar in type 2 diabetic patients. *Iran Red Crescent Med J.* 2012;14(7):442-446.
30. Aris A, Blake H, Adam G. Health beliefs predict self-care practices and glycaemic control in Malaysian patients with insulin-treated diabetes: a longitudinal study. *Malays J Public Health Med.* 2017;17(2):80-89.
31. Yang L, Wu Q, Hao Y, et al. Self-management behavior among patients with diabetic retinopathy in the community: a structural equation model. *Qual Life Res.* 2017;26:359-366.
32. Ağralı H. Tip 2 diyabet hastalarında sağlık okuryazarlığı düzeyine göre sağlık inanç modeline dayalı verilen eğitim ve danışmanlığın glisemik kontrole etkisi [doktora tezi]. Ankara: Hacettepe Üniversitesi Sağlık Bilimleri Enstitüsü; 2020.
33. Kim MY, Lee EJ. Factors affecting self-care behavior levels among elderly patients with type 2 diabetes: a quantile regression approach. *Medicina (Kaunas).* 2019;55(7):340.
34. Albikawi ZF, Abuadas M. Diabetes self-care management behaviors among Jordanian type 2 diabetes patients. *Am Int J Contemp Res.* 2015;5(3):87-95.
35. Robat Sarpooshi D, Mahdizadeh M, Siuki HA, et al. The relationship between health literacy level and self-care behaviors in patients with diabetes. *Patient Relat Outcome Meas.* 2020;11:129-136.

36. Wongrith P. Predicting diabetic self-care management based on the theory of planned behavior among elderly with type 2 diabetes in Thailand. *Diabetes Mellitus*. 2019;22(4):367-376.
37. Butayeva, J., Ratan, Z. A., Downie, S., & Hosseinzadeh, H. The impact of health literacy interventions on glycemic control and self-management outcomes among type 2 diabetes mellitus: A systematic review. *Journal of Diabetes*, 2023;15(9):724-735.