



Research Article

# Relationship between Religious Coping, Acceptance of Illness and Diabetes Self-Efficacy in Patients with Type 2 Diabetes

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**Abstract**

This study aimed to determine the relationship between religious coping, acceptance of illness and diabetes self-efficacy in patients with Type 2 diabetes. This descriptive and cross-sectional study was conducted between 15/08/2022 and 15/03/2023 with 606 patients with Type 2 diabetes who attended Family Health Centers in a province center in eastern Türkiye. Model fits were found to be at satisfactory levels ( $\chi^2/df=2.529$ , RMSEA=0.05, CFI=0.91, GFI=0.91, AGFI=0.88, IFI=0.91). Positive religious coping positively affected negative religious coping ( $\beta_0=0.123$ ,  $p=0.012$ ). Negative religious coping positively affected diabetes self-efficacy ( $\beta_0=0.099$ ,  $p=0.039$ ). Diabetes self-efficacy positively affected the level of acceptance of illness ( $\beta_0=0.430$ ,  $p=0.001$ ). It was determined that religious coping, acceptance of disease and diabetes self-efficacy were related in Type 2 diabetes patients. Longitudinal studies on factors affecting patients with Type 2 diabetes are recommended.

**Keywords:**

Type 2 diabetes • Religious coping • Acceptance of illness • Self-efficacy

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## Introduction

Diabetes poses an escalating global public health challenge, representing a chronic and advancing condition that places strain on healthcare systems. It is prevalent across all age groups, leading to adverse health outcomes and significantly impacting quality of life (Saeedi et al., 2019; Tomlin & Sinclair, 2016). In 2019, 463 million people worldwide were diagnosed with diabetes. The data forecasts a growth trend, with the estimated figure expected to reach 578 million by 2030. Furthermore, projections anticipate a subsequent increase, reaching 700 million by the year 2045 (Saeedi et al., 2019).

When they experience illness, people may feel helpless and distressed (Ayten et al., 2012). Religious beliefs can be a haven for people by increasing their resilience in the face of feelings of fear and helplessness that arise in difficult times (Karakas & Koç, 2014). In these difficult times, the most frequently used coping method is religious coping (Ayten et al., 2012). Religious coping is recognized as a factor that promotes adherence to disease management and treatment among individuals with chronic illnesses (Sousa et al., 2017). Religious coping involves the intentional use of one's religious beliefs or practices as a means to confront and overcome the challenges that life presents, aiming to find solace and alleviate emotional distress (Larbi et al., 2017). In essence, it entails an individual's endeavor to establish a spiritual connection, seek support, or collaborate with God in problem-solving. The role of religious coping can manifest both positively or negatively in terms of accepting an illness. Positive religious coping methods include prayer, positive thinking, establishing a secure relationship with a creator figure, making sense of life and believing in this creator's help. Negative religious coping methods include belief in abandonment by the creator, withdrawal and divine punishment (Fincham et al., 2018; Shamsalinia et al., 2016). As such, it is advisable to assess the impact of religious and spiritual beliefs on patients before incorporating them as a treatment tool (Sousa et al., 2017).

The most important factor that facilitates coping is that individuals accept their illness and maintain their sense of autonomy. This pivotal acceptance of illness is integral to disease management, as it prompts individuals to implement crucial changes in their self-care practices and lifestyles. Accepting the illness reduces the negative emotions experienced by individuals, improves their quality of life, and increases protective and curative health behaviors (Besen & Esen, 2011). Previous studies have indicated that the degree of illness acceptance in individuals with diabetes notably influences their life satisfaction and overall quality of life (Lewko et al., 2012; Rogon et al., 2017).

Self-efficacy is a psychological concept that refers to an individual's belief in their own capacity to successfully execute a specific behavior or task. It is rooted in one's confidence and perceived competence, serving as a crucial determinant in approaching

challenges and persistence in achieving goals. Considered a fundamental aspect of an individual's capabilities, self-efficacy is distinct and should be recognized as an independent factor in terms of a person's basic skills. It significantly influences motivation, effort and resilience, shaping the individual's overall ability to navigate and succeed in various endeavors (Williams et al., 2014). Self-efficacy is one of the significant factors that contribute to the control of diabetes and the success of personal care. Previous studies have indicated that self-efficacy is a viable concept that can be used to understand and predict patients' self-care behaviors in the treatment of diabetes (King et al., 2010; Sarkar et al., 2006). For individuals with diabetes, maintaining an adequate level of self-efficacy is crucial for effectively managing the complexities of diabetes treatment and care (Mankan et al., 2017).

In this context, the patient's acceptance of the disease, religious coping and self-efficacy may have a critically important role in controlling the disease (Besen & Esen, 2011; Mankan et al., 2017; Sousa et al., 2017). In addition, self-efficacy is an important motivational resource in the management of chronic diseases (Karadayi Kaynak, 2022). Determining the relationship between religious coping, illness acceptance and self-efficacy in diabetes will guide future studies in this area. No analogous studies exist in the current literature. The primary objective of this research was thus to investigate the relationships between religious coping, acceptance of illness, and diabetes self-efficacy in individuals diagnosed with Type 2 diabetes.

### **Research Hypotheses:**

H<sub>1</sub>: There is a significant correlation between positive religious coping and negative religious coping.

H<sub>2</sub>: There is a significant correlation between positive religious coping and diabetes self-efficacy.

H<sub>3</sub>: There is a significant correlation between positive religious coping and acceptance of illness.

H<sub>4</sub>: There is a significant correlation between negative religious coping and diabetes self-efficacy.

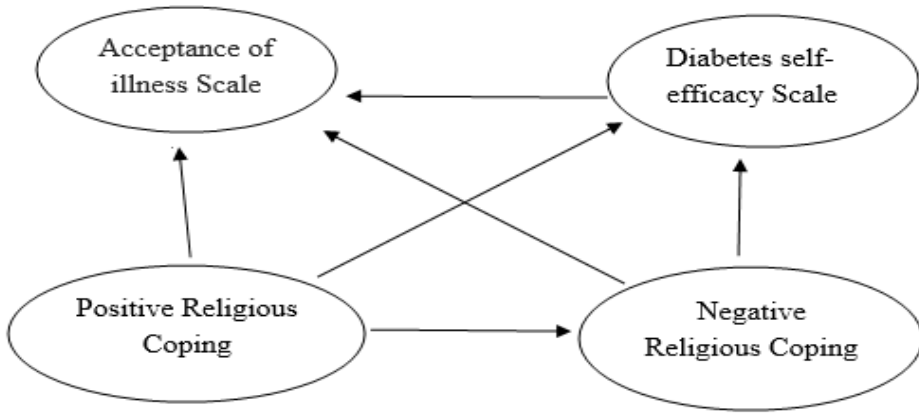
H<sub>5</sub>: There is a significant correlation between negative religious coping and acceptance of illness.

H<sub>6</sub>: There is a significant correlation between diabetes self-efficacy and acceptance of illness.

The structural equation model predicted between religious coping, acceptance of illness, and diabetes self-efficacy is given in Figure 1.

**Figure 1.**

*Structural Equation Model Predicted Between Religious Coping, Acceptance of Illness, and Diabetes Self-Efficacy*



## Method

This study is a descriptive and cross-sectional study. It was conducted between 15/08/2022 and 15/03/2023 with 606 Type 2 diabetes patients who attended Family Health Centers (FHCs) in a provincial capital in the east of Türkiye.

## Universe of the Study and Sampling

The population of the study consisted of all Type 2 diabetes patients who attended Family Health Centers located in the center of a provincial capital in eastern Turkey. The minimum sample size for the study was determined using the formula for an unknown population (n:384). Post hoc power analysis is a statistical analysis performed after the data collection phase of a study. This analysis evaluates the power of a hypothesis test based on the sample obtained. Power analysis is used to understand how much a study's sample size, level of interaction and variance affect the success rate of a hypothesis test. In the post hoc power analysis, 606 participants were found to be sufficient (Cohen, 1988). The STROBE guide aims to guide researchers in reporting their work with greater integrity and transparency. In this way, readers can access more comprehensive and reliable information about the design, conduct and results of research. The STROBE guideline was used in the reporting of this research article (Vandenbrouckel et al., 2007).

## Inclusion and Exclusion Criteria

All patients who voluntarily agreed to participate in the study, were able to understand and complete the research forms, had been diagnosed with diabetes for at least six months, and were 18 years of age or older were included in the study. Those who filled out the data collection form incompletely were not included in the study.

## **Data Collection Tools**

### **Personal Information Form**

A Personal Information Form is a document used to collect a person's individual characteristics, demographic information and general research parameters. This form is used to create a background of the participants and to give researchers the opportunity to analyze specific demographic groups. This type of information collection tool allows researchers to better understand the participants and assess the overall context of the research. The Personal Information Form used in this study was prepared by the researchers and consisted of questions about the participants' age, gender, marital status, education and income.

### **Religious Coping Scale (RCS)**

The Religious Coping Scale (RCS) was developed by Ekşi and Sayın (2016). It is a research tool that measures how individuals use their religious beliefs to cope with the difficulties and stressful situations they experience. The scale consists of a total of 10 items and two sub-dimensions. The sub-dimensions are positive religious coping (seven items) and negative religious coping (three items). The RCS is a four-point Likert-type scale. The original Cronbach's alpha internal consistency coefficient for the positive religious coping subscale was .91, while the original Cronbach's alpha internal consistency coefficient for the negative religious coping subscale is .86 (Ekşi & Sayın, 2016). In our study, the Cronbach's alpha value was .73 for the positive religious coping subscale, while it was .87 for the negative religion coping subscale.

### **Acceptance of Illness Scale (AIS)**

The Acceptance of Illness Scale (AIS) is a Likert-type scale developed by Felton and Revenson (1984) in the United States and created by quoting Linkowski's Sickness Impact Scale. The validity and reliability study for Turkish society of the scale was carried out by Besen and Esen (2011). The AIS consists of eight items. The scale score represents the overall measure of disease acceptance. Disagreements with the statements used in the scale items are evaluated with a high score (5 points) indicating the absence of negative feelings about the disease and the presence of acceptance of illness (Besen & Esen, 2011). The original Cronbach's alpha internal consistency coefficient of the scale was 0.79. In our study, the Cronbach's alpha internal consistency coefficient of the scale was found to be 0.78.

### **Diabetes Self-Efficacy Scale (DSES)**

The Diabetes Self-Efficacy Scale (DSES) was developed by Lorig et al. (2009). The scale was adapted to Turkish by Mankan et al. (2017). It is a research tool used

to assess individuals' levels of self-efficacy in coping with diabetes. The scale aims to measure people's beliefs in certain diabetes-related skills, treatment practices and lifestyle changes. It is often used to determine individuals' level of confidence in their own diabetes management and to assess their potential to adhere to treatment plans and improve health outcomes. The scale usually includes a series of statements or situations and participants respond to these statements to assess their level of confidence in their own diabetes-related abilities. The Likert-type scale consists of eight items. The Cronbach's alpha coefficient of the scale developed by Lorig et al. was 0.89 (Lorig et al., 2009). The Cronbach's alpha was later found to be 0.86 (Mankan et al., 2017). In this study, the Cronbach's alpha was found to be 0.81.

### **Reliability Analysis of Scales**

Structural Equation Modeling (SEM) usually includes a set of statistical measures used to assess the reliability of the variables used in the measurements and the structural model. These measures determine the level of error in the measurements and provide information about the reliability of the measurement instruments and the model. In the study, the reliability of the variables was confirmed by determining the Cronbach's alpha coefficient ( $>0.60$ ) values of the scales (Hu & Bentler, 1999; Karagöz, 2019).

### **Data Analysis**

Data analysis was conducted using statistical software packages, including the SPSS 22.0, AMOS V 24.0, and G\*Power 3.1. These software tools are commonly employed in the field of statistics and research to perform various analyses and tests. The combination of SPSS, AMOS, and G\*Power indicates a comprehensive approach to data analysis, including descriptive statistics, SEM and consideration of statistical power. These tools collectively assist researchers in exploring relationships, testing hypotheses, and ensuring the robustness of their findings. In the study, SEM was used to analyze the data. The AMOS V 24.0 program was used in this analysis. SEM is a statistical method often used in the social sciences, psychology, economics and other disciplines to understand complex relationships and structures. This modeling technique is used to understand the relationships between observed variables and the underlying structures behind these variables.

### **Ethical Principles of the Study**

The research was approved by the Scientific Research and Publication Ethics Committee of a University (Date: 01.03.2022, Number: 42261). The researcher provided information about scales face-to-face to the patients who were going to participate in the research. To safeguard individual rights throughout the study,

adherence to the Helsinki Declaration on Human Rights was strictly maintained. This declaration is an ethical document published by the World Medical Association (WMA). It was first adopted in Helsinki in 1964 and has been updated several times since then. It sets out ethical rules and guidance for researchers regarding the participation of people in clinical research (Rickham, 1964).

## Results

**Table 1**  
*Characteristics of Participants (n=606)*

Demographic Characteristics	n	%	
Gender	Male	279	46.0
	Female	327	54.0
Marital Status	Married	469	77.4
	Single	137	22.6
Educational status	Illiterate	185	30.5
	Only literate	88	14.5
	Primary school	144	23.8
	Secondary school	123	20.3
Monthly income status	Higher education	66	10.9
	Income less than expenditure	117	19.3
	Income equal to expenditure	457	75.4
Years of diabetes	Income more than expenditure	32	5.3
	0-5 years	204	33.7
	6-10 years	199	32.8
Years of diabetes	11-15 years	126	20.8
	16-20 years	55	9.1
	21 years or more	22	3.6
$\bar{x} \pm$ Standard Deviation			
Age (Years)	52.38 $\pm$ 12.24		

It was determined that 54.0% of the individuals who participated in the study were female and 77.4% were married. When the educational status of the participants was analyzed, it was found that 30.5% were illiterate, 14.5% were only literate, 23.8% had primary education, 20.3% had secondary education and 10.9% had higher education. It was determined that 75.4% of the participants had an income was equal to their expenditure, 19.3% had an income less than their expenditure and 5.3% had an income more than their expenditure. It was found that 33.7% of the participants had had diabetes for 0-5 years, 32.8% had had it for 6-10 years, 20.8% had had it for 11-15 years, 9.1% had had it for 16-20 years, 3.6% for 21 years or more, and the mean age of the individuals was 52.38 $\pm$ 12.24 (years) (Table 1).

### Structural Equation Modeling (SEM)

Fit indices of the scales were calculated with SEM.

### Assumption Analysis

Before using SEM, some basic requirements need to be considered. These requirements are important for the model to be implemented correctly and for the results to be reliable. All the assumptions required for SEM analysis were verified. The study ensured an ample sample size, verified that variables exhibited multi-normal distributions, confirmed the absence of multicollinearity among variables, and identified the absence of outliers (Collier, 2020; Gürbüz, 2019).

### Validity Analysis of Scales

Fit indices are statistical measures used in SEM to assess how well the model fits the observed data set. These indices are used to assess the fit of the model with its theoretical framework and to understand how well the model explains the observed data. Various fit indices in data analysis results are used to assess how well SEM explains the data. Fit indices are used to guide researchers in assessing and improving how well the model fits. For the RCS, the fit indices were determined as  $\chi^2/df=4.065$ , RMSEA=0.07, CFI=0.94, GFI=0.95, AGFI=0.92, IFI=0.94 and TLI=0.94. For the AIS, the fit indices were determined as  $\chi^2/df=2.677$ , RMSEA=0.05, CFI=0.98, GFI=0.98, AGFI=0.96, IFI=0.98 and TLI=0.96. For the DSES the fit indices were determined as  $\chi^2/df=3.948$ , RMSEA=0.07, CFI=0.96, GFI=0.97, AGFI=0.94, IFI=0.96 as TLI=0.94. The construct validity of the scales was thus confirmed (Karagöz, 2019).

The fit indices are used to assess the fit of the SEM. To summarize:  $\chi^2/df$  is an index that evaluates the fit of the model. A value of 2.529 indicates that the model is a good fit to the data. RMSEA is an index that evaluates the fit of the model. A low value of 0.05 indicates that the model fits the observed data well. CFI is an index that assesses the fit of the model and a value of 0.91 indicates that the model provides a reasonable fit. GFI is an index that assesses the fit of the model with the observed data. A value of 0.91 indicates that the model provides a good fit. AGFI assesses the fit of the model in a similar way to GFI but corrected for degrees of freedom. A value of 0.88 can be considered an adjusted measure of fit. IFI is a similar index to CFI and a value of 0.91 indicates that the model provides a good fit. In general, low RMSEA and high CFI, GFI, AGFI, IFI values indicate that the model provides a good fit (Karagöz, 2019).

As a result of the model:

H<sub>1</sub>: H<sub>1</sub> was accepted: “Positive religious coping positively affects negative religious coping” (Figure 2; Table 2).

H<sub>2</sub>: “There is a significant relationship between positive religious coping and diabetes self-efficacy” was not confirmed ( $p>0.05$ ) and H<sub>2</sub> was rejected (Table 3).



H<sub>3</sub>: “There is a significant correlation between positive religious coping and acceptance of illness” was not confirmed ( $p>0.05$ ) and H<sub>3</sub> was rejected (Table 3).

H<sub>4</sub>: H<sub>4</sub> was accepted: “Negative religious coping positively affects diabetes self-efficacy” (Figure 2; Table 2).

H<sub>5</sub>: “There is a significant correlation between negative religious coping and acceptance of illness” was not confirmed ( $p>0.05$ ) and H<sub>5</sub> was rejected (Table 3).

H<sub>6</sub>: H<sub>6</sub> was accepted. “Diabetes self-efficacy positively affects the level of acceptance of illness” (Figure 2; Table 2).

**Table 2**

*Relationships Between Individuals' Religious Coping, Acceptance of Illness and Diabetes Self-Efficacy*

Independent Variable	Dependent Variable	$\beta 0$	$\beta 1$	S.E.	C.R	<i>p</i>
Positive Religious Coping Scale	Negative Religious Coping Scale	0.123	0.241	0.095	2.527	<b>0.012</b>
Negative Religious Coping Scale	Diabetes Self Efficacy Scale	0.099	0.115	0.056	2.067	<b>0.039</b>
Diabetes Self Efficacy Scale	Acceptance of Illness Scale	0.430	0.301	0.044	6.842	<b>0.001</b>

*$\beta 0$  = Standardized regression coefficient;  $\beta 1$  = Non-standardized regression coefficient.*

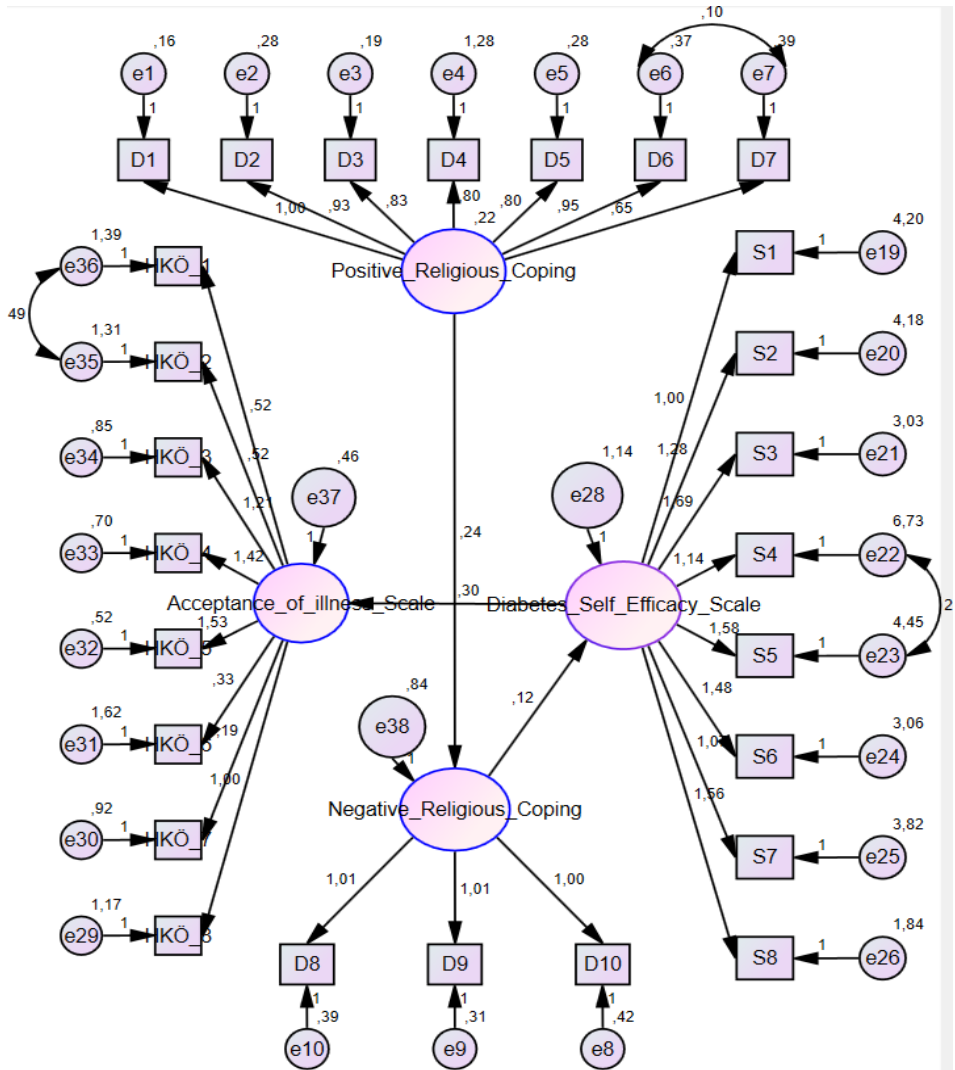
**Table 3**

*Relationships Between Individuals' Religious Coping, Acceptance of Illness, and Diabetes Self-Efficacy*

Dependent Variable	Independent Variable	<i>B</i>	S.E.	$\beta$	<i>t</i>	<i>p</i> *
<b>Acceptance of Illness Scale</b>	Constant	14.256	2.002		7.256	<b>0.001</b>
	Positive Religious Coping	0.032	0.075	0.016	0.422	0.673
	Negative Religious Coping	0.001	0.084	0.000	0.007	0.994
	Diabetes Self-Efficacy	0.188	0.019	0.375	9.865	<b>0.001</b>
<i><math>R=0.376</math>; <math>R^2=0.142</math>; Adjusted <math>R^2=0.137</math>; <math>F=33.10</math>; <math>p=0.001</math></i>						
<b>Diabetes Self-Efficacy Scale</b>	Constant	42.370	3.909		10.839	<b>0.001</b>
	Positive Religious Coping	0.136	0.160	0.035	0.848	0.397
	Negative Religious Coping	0.462	0.179	0.106	2.589	<b>0.010</b>
<i><math>R=0.117</math>; <math>R^2=0.014</math>; Adjusted <math>R^2=0.010</math>; <math>F=4.156</math>; <math>p=0.016</math></i>						
<b>Negative Religious Coping</b>	Constant	3.397	0.880		3.860	<b>0.001</b>
	Positive Religious Coping	0.140	0.036	0.156	3.887	<b>0.001</b>
<i><math>R=0.156</math>; <math>R^2=0.024</math>; Adjusted <math>R^2=0.023</math>; <math>F=15.110</math>; <math>p=0.001</math></i>						

**Figure 2**

SEM Diagram Showing the Relationships between Religious Coping, Acceptance of Illness, and Diabetes Self-Efficacy



$\chi^2/df=2.529$ ,  $RMSEA=0.05$ ,  $CFI=0.91$ ,  $GFI=0.91$ ,  $AGFI=0.88$ ,  $IFI=0.91$

## Discussion

This section provides comprehensive analysis of our study's findings in relation to the current literature in the field.

In our study positive religious coping positively affected negative religious coping ( $p < 0.05$ ). In the literature, a positive relationship was found between religious coping strategies in the study conducted by Doğan and Karaca (2021). Similarly, in the study of Çetin and Güzeoloğlu, it was determined that positive and negative religious coping strategies were positively related (Çetin & Güzeoloğlu, 2022). These results can be considered as showing that when long-term use of positive religious coping strategies fail to help individuals with Type 2 diabetes, they may then turn to negative religious coping. The religious behaviors exhibited by individuals with type 2 diabetes may change due to the duration over time of their disease and individuals may even use both positive and negative forms of coping at the same time. In this context, it can be interpreted as a natural process that the coping behaviors of individuals living under constant intense anxiety may change.

In the current study, negative religious coping positively affected diabetes self-efficacy ( $p < 0.05$ ). In the literature, it has been found that negative religious coping is positively related to maladaptive emotional regulation and this leads to distressing emotional states (Fatima et al., 2022). In the context of diabetes, individuals who used avoidance-focused coping, a form of negative coping, showed negative diabetes self-care activities (Hapunda, 2022). Negative religious coping has been associated with decreased self-esteem and increased depressive symptoms (Park et al., 2018). Negative religious coping usually refers to situations where an individual processes difficult situations in a negative way through their religious beliefs, for example, seeing bad events as punishment from God. This type of coping can often increase stress and anxiety and reduce one's sense of control over the situation. It may be that people who use negative religious coping seek additional ways to cope with the stress and difficulties they experience and, in the process, begin to feel more competent. For example, religious struggles may prompt them to seek more information, join support groups or become more active in diabetes management. This is thought to indicate the complexity of individuals' inner worlds and the ways available to them of coping with external influences.

In the study, as the level of diabetes self-efficacy increased, the level of acceptance of illness also increased. Diabetes self-efficacy significantly affects the acceptance of the disease in individuals with diabetes. The study showed that self-efficacy has a direct effect on diabetes self-care practices (Devarajoo & Chinna, 2017). Individuals with higher levels of self-efficacy show better compliance with self-care behaviors, leading to improved disease management. Moreover, self-efficacy is positively

associated with disease acceptance in various populations, including pregnant women with hyperglycemia (Iwanowicz-Palus et al., 2020). In addition, self-efficacy is closely related to self-care attitudes in patients with diabetes (Permatasari, 2019). Patients with greater self-efficacy are more likely to engage in proactive self-care behaviors, ultimately improving disease management and potentially increasing levels of disease acceptance.

The findings of the current study are similar to those in the literature. There is a significantly strong negative correlation in all or some of the self-care activities of individuals with no acceptance of illness (Saleh et al., 2014; Smalls et al., 2014). Schmitt et al. identified a robust negative correlation among individuals exhibiting low diabetes acceptance across various self-care activities. Their research revealed that low acceptance was inversely linked to critical diabetes outcomes, encompassing diminished self-care practices and suboptimal glycemic control (Schmitt et al., 2014). High acceptance of the illness leads to increased self-care behaviors and better results in coping strategies (Lindholm-Olinder et al., 2015). Low acceptance of the illness, on the other hand, leads to low adherence to diabetes management and has a negative effect on glycemic control (Melton, 2016). Since diabetes is a lifelong disease that requires behavior change, the adaptation of the individual is essential in ensuring optimal diabetes control. Individuals with diabetes should be assisted in their path towards accepting the illness in order to provide effective diabetes management and self-care activities. Numerous studies have concluded that practices related to behavior change are beneficial (Bertolin et al., 2015; Hayes et al., 2013; Melton, 2016).

### **Limitations and Generalizability of the Study**

The findings of a cross-sectional study may be specific to the particular time period and geographical location where the study was conducted. Therefore, it is difficult to generalize the results to different time periods or geographical regions. Cross-sectional studies cannot capture changes or trends over time. This is a limitation, especially for research that wants to examine long-term changes or developments. In cross-sectional studies, the simultaneous measurement of the presence of the condition or factor and the outcome leads to the problem of not being able to determine which came first. This can lead to misleading conclusions about the causes of a particular health condition, especially in health research. Cross-sectional studies may be insufficient to determine cause-and-effect relationships because data collection takes place at a single point in time. These studies can only observe the relationships between variables and cannot provide conclusive results on whether these relationships are causal or not.

## Conclusion

In the current study, it was found that the increase in the level of positive religious coping increased the level of negative religious coping. It was determined that the increase in the level of negative religious coping of individuals with Type 2 diabetes increased the level of diabetes self-efficacy. It was determined that the increase in the level of diabetes self-efficacy of individuals positively affected the level of acceptance of the disease. The factors of religious coping strategies, self-efficacy and disease acceptance should be considered in individuals with Type 2 diabetes. This will guide nurses in determining which factors are most effective in increasing diabetes self-efficacy in Type 2 diabetic patients. In particular, nurses should make more accurate assessments of the level of disease acceptance and should consider the effects of the religious factors that may affect the individual positively or negatively while receiving care. Further longitudinal studies on factors affecting patients with type 2 diabetes are recommended.

**Acknowledgement.** We thank all the patients who participated in the study.

**Ethical approval.** The study was approved by Scientific Research and Publication Ethics Committee of Muş Alparslan University (Approval no: 42261). This study conforms to the ethical guidelines of the 1975 Declaration of Helsinki.

**Authors' contribution.** Study conception and design: M.Y. and N.Ç., Data collection: N.Ç., Literature search: M.Y. and N.Ç., Data analysis and interpretation: M.Y., Writing Manuscript: M.Y. and N.Ç., Critical

revision of the article: M.Y. and N.Ç.

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**Disclosure statement.** The authors declare that they have no conflict of interest.

**Data Availability Statements.** The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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