

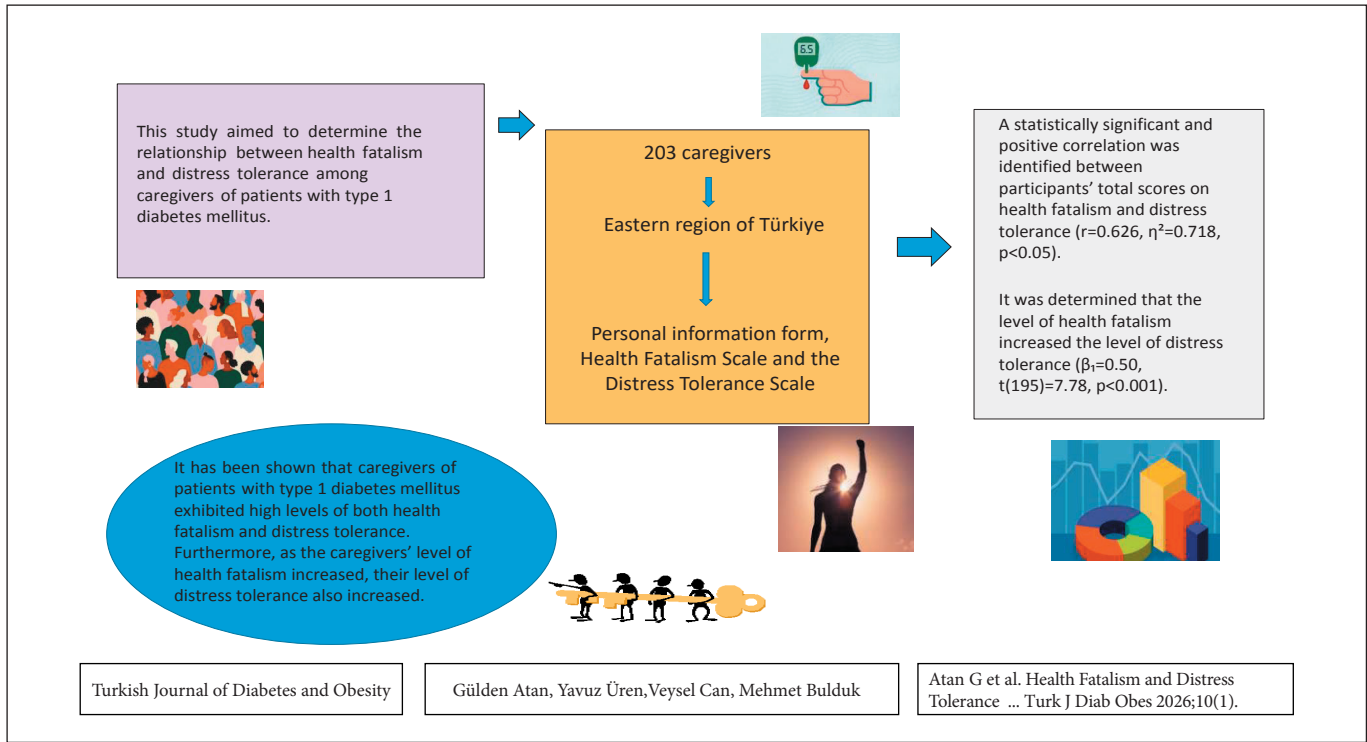
Health Fatalism and Distress Tolerance in Caregivers of Patients with Type 1 Diabetes: A Cross-Sectional Study

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GRAPHICAL ABSTRACT



ABSTRACT

Aim: The purpose of this research was to determine the relationship between health fatalism and distress tolerance among caregivers of patients with type 1 diabetes mellitus.

Material and Methods: This cross-sectional study was carried out with 203 caregivers at a state hospital located in the eastern region of Turkey, between August and November 2024. Personal information form, Health Fatalism Scale and the Distress Tolerance Scale were used in the study. Number, percentage, mean, standard deviation, minimum-maximum values, t-test, pearson correlation and regression analyses were used to analyze the data. The statistical significance level was assumed to be $p < 0.05$.

Results: The participants' mean total score for health fatalism was found to be 53.91 ± 19.12 . The mean total score for distress tolerance was determined as 43.92 ± 14.84 . A statistically significant and positive correlation was identified between participants' total scores on

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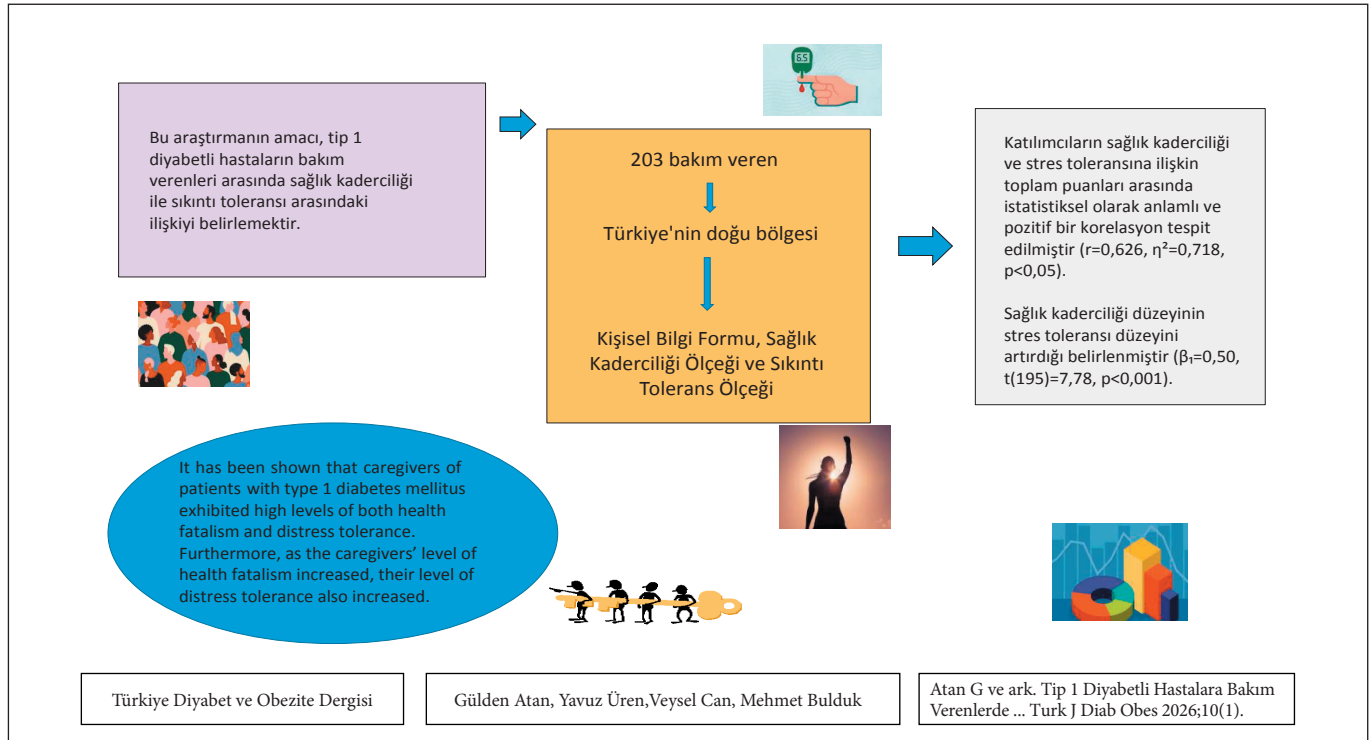
health fatalism and distress tolerance ($r=0.626$, $\eta^2=0.718$, $p<0.05$). It was determined that the level of health fatalism increased the level of distress tolerance ($\beta_1=0.50$, $t(195)=7.78$, $p<0.001$).

Conclusion: It has been shown that caregivers of patients with type 1 diabetes mellitus exhibited high levels of both health fatalism and distress tolerance. Furthermore, as the caregivers' level of health fatalism increased, their level of distress tolerance also increased.

Keywords: Type 1 diabetes, Health fatalism, Distress tolerance

Tip 1 Diyabetli Hastalara Bakım Verenlerde Sağlık Kaderciliği ve Sıkıntı Toleransı: Kesitsel Bir Çalışma

GRAFİKSEL ÖZET



ÖZ

Amaç: Bu araştırmanın amacı, tip 1 diyabetli hastaların bakım verenleri arasında sağlık kaderciliği ile sıkıntı toleransı arasındaki ilişkiyi belirlemektir.

Gereç ve Yöntemler: Bu kesitsel çalışma, Ağustos-Kasım 2024 tarihleri arasında Türkiye'nin doğu bölgesinde bulunan bir devlet hastanesinde 203 bakım veren ile yürütülmüştür. Çalışmada kişisel bilgi formu, Sağlık Kaderciliği Ölçeği ve Sıkıntı Tolerans Ölçeği kullanılmıştır. Verilerin analizinde sayı, yüzde, ortalama, standart sapma, minimum-maksimum değerler, t-testi, Pearson korelasyon ve regresyon analizleri kullanılmıştır. İstatistiksel anlamlılık düzeyi $p < 0,05$ olarak varsayılmıştır.

Bulgular: Sağlık kaderciliği toplam puanı $53,91 \pm 19,12$ olarak bulunmuştur. Sıkıntı toleransı toplam puanının ortalaması $43,92 \pm 14,84$ olarak bulunmuştur. Katılımcıların sağlık kaderciliği ve stres toleransına ilişkin toplam puanları arasında istatistiksel olarak anlamlı ve pozitif bir korelasyon tespit edilmiştir ($r=0,626$, $\eta^2=0,718$, $p<0,05$). Sağlık kaderciliği düzeyinin stres toleransı düzeyini artırdığı belirlenmiştir ($\beta_1=0,50$, $t(195)=7,78$, $p<0,001$).

Sonuç: Tip 1 diyabetli hastaların bakım verenlerinin hem sağlık kaderciliği hem de sıkıntı toleransı düzeylerinin yüksek olduğu gösterilmiştir. Ayrıca, bakım verenlerin sağlık kaderciliği düzeyi arttıkça, sıkıntı toleransı düzeyleri de artmaktadır.

Anahtar Sözcükler: Tip 1 diyabet, Sağlık kaderciliği, Sıkıntı toleransı

INTRODUCTION

Among the families of children diagnosed with type 1 diabetes, the individuals most affected by the changes the disease imposes on daily life are the children themselves, their parents, and their primary caregivers. Managing this disease is a highly demanding and stressful process, requiring continuous monitoring and attention from caregivers, along with strict adherence to a complex care regimen (1,2). The caregiver, who often shares a living space with the patient, devotes a substantial portion of their time to care and assumes a central role in medical management (3).

Fatalism in health refers to the belief that individuals have no control over the health-related difficulties they encounter and that these events are predetermined by a supernatural force. It is known that fatalistic attitudes emerge predominantly through religion, cultural influences, and the collective historical experiences of a society. Fatalism, therefore, influences how individuals interpret events across various domains (4). A person with a high level of health-related fatalism tends to believe that they played no role in the onset of a negative event and that it is instead determined by fate or divine will. Consequently, fatalism has been considered a factor that may contribute to the development or progression of disease (5). In fulfilling these roles, planning and ensuring the continuity of training for both the individual with diabetes and their caregivers is highlighted as the most important way to prevent potential complications (6,7).

Distress tolerance is a personal attribute that varies across individuals. It is defined as the capacity to experience and endure negative psychological states. Individuals with low distress tolerance tend to perceive emotional discomfort as intolerable and often seek immediate ways to alleviate any unwanted emotional or psychological experiences (8). In the caregiving process, the use of religious beliefs and values has been found to be effective in coping with the stress and difficulties brought about by the patient's condition (9).

A study conducted in Canada indicated that fatalistic beliefs and religiosity may significantly influence the alleviation of distress and depression. It also reported that fatalism can serve as an effective coping mechanism for life challenges (10,11). Research on coping mechanisms in chronic illness has shown that caregivers of individuals with chronic diseases often turn to religion. Other studies have found that families frequently establish a positive link between spirituality and mental well-being (12). Thus, in-depth exploration of this topic would be beneficial.

Given the ongoing interaction between individuals with type 1 diabetes and their caregivers, assessing caregivers' beliefs about the illness, their understanding of health-related

fatalism, and their level of distress tolerance is crucial for ensuring effective care and controlling complications. Fatalism is a prevalent mindset in Türkiye due to dominant cultural traits and religious orientations (13). Health fatalism leads individuals to perceive health outcomes as largely beyond their control and unchangeable, reducing their perceived level of control; this can result in the adoption of more passive coping strategies in the face of stressful life events. This decreased perceived control and increased use of ineffective coping mechanisms can limit individuals' capacity to withstand distress. To date, no studies have been found in the literature that simultaneously examine the relationship between health-related fatalism and distress tolerance among caregivers of individuals with type 1 diabetes. Therefore, the present study was undertaken to address this gap and contribute to the existing knowledge base.

MATERIAL and METHODS

The aim of this study is to determine the relationship between health fatalism and distress tolerance among caregivers of patients with Type 1 diabetes mellitus. Accordingly, the study sought to determine the levels of health-related fatalism and distress tolerance among caregivers, as well as whether there is a significant relationship between these two variables. The main hypothesis of the study is that the level of health-related fatalism among caregivers of patients with Type 1 diabetes has an effect on their level of distress tolerance, whereas the null hypothesis states that health-related fatalism has no effect on distress tolerance.

Study Design and Participants

The universe of this cross-sectional study consisted of 356 caregivers of patients diagnosed with type 1 diabetes. It was determined that at least 185 caregivers should be examined with a margin of error of 0.05 and a power of 95 % for the sample

$$n = \frac{Nt^2pq}{d^2(N-1) + t^2pq}$$

The parameters used in the calculation were as follows:

n = required sample size

N = size of the population (356)

p = estimated frequency of the event under investigation (0.50)

q = probability of the event not occurring (1 - p) = 0.50

t = standard value corresponding to the desired confidence level (1.96 for 95% confidence)

d = acceptable margin of error (0.05)

$$n = \frac{356 \cdot (1.96)^2 \cdot 0.50 \cdot 0.50}{d(0.05)^2(356 - 1) + t(1.96)^2 \cdot 0.50 \cdot 0.50} = 185$$

The sample of the study consisted of 203 caregivers who met the inclusion criteria: having no communication difficulties, being cognitively capable of answering the questions, being related to the patient, and volunteering to participate in the study. This number represented approximately 57% of the target population. The research was carried out between August and November 2024 at a state hospital located in the eastern region of Türkiye.

Data Collection Tools

Personal information form: The form was prepared by the researchers based on literature findings and consists of nine questions regarding the caregivers' age, gender, educational status, marital status, employment status, and similar socio-demographic characteristics (1,3,13).

Health Fatalism Scale (HAS): The scale was developed by Franklin, et al. (14). Its Turkish adaptation, including validity and reliability analyses, was conducted by Bobov and Çapik (15). The scale was designed to determine whether general health fatalism is associated with health-related behaviors. Additionally, it aims to help eliminate cognitive barriers to engaging in health behaviors, accessing health-care services, and maintaining healthy lifestyle practices. The Turkish version of the scale is unidimensional and consists of 17 items rated on a 5-point Likert scale, with response options ranging from “strongly disagree” to “strongly agree.” The total score ranges from 17 to 85, with higher scores indicating a higher level of fatalistic beliefs. In their study, Bobov and Çapik reported a Cronbach's alpha coefficient of 0.91 for the Turkish version of the scale (15). In this study, Cronbach's alpha value for the scale was determined to be 0.95.

Distress Tolerance Scale (DTS): The scale was developed by Simons and Gaher (2005), revised by Sargin et al. (2012) (8,16). The scale is a 15-item self-report measure rated on a 5-point Likert scale. It comprises four subscales: tolerance of distress, appraisal of distress, absorption of attention by distressing emotions, and efforts to regulate or reduce distress. Total scores range from 5 to 75. Although there is no specified cutoff score, higher scores indicate a greater capacity for distress tolerance. The original scale demonstrated a high level of internal consistency, with a Cronbach's alpha of $\alpha = .93$ (8). The Turkish version yielded a Cronbach's alpha coefficient of $\alpha = .89$ for the total scale (16). In this study, Cronbach's alpha value for the scale was determined to be 0.90.

Statistical Analysis

The research data were analyzed using the IBM SPSS Statistics 26.0 package program. Descriptive statistics, including frequency (n), percentage (%), mean, standard deviation and minimum/maximum values, were utilized to summarize the data (17). The normality of the data distribution was assessed based on skewness and kurtosis values. In accordance with the criteria suggested by Fein et al, values ranging between -2.0 and +2.0 were considered indicative of a normal distribution (18). The internal consistency of the scales was evaluated using the Cronbach's Alpha coefficient. Since the reliability coefficients were at an acceptable level, analyses were conducted based on the total scale scores (19). Relationships between variables were examined using Pearson correlation coefficient. Correlation strength was interpreted as low (0.10–0.29), moderate (0.30–0.49), or high (>0.50) (20). To determine the magnitude of differences, eta-squared (η^2) was calculated as an effect size measure, with values categorized as small (0.01–0.06), moderate (0.06–0.14), or large (>0.14) (21). Statistical significance was set at $p < 0.05$ for all tests (17).

For group comparisons, the Independent Samples t-test (t) was employed for two unrelated groups, and One-Way Analysis of Variance (ANOVA, F) was used for multiple group comparisons. Assumptions of homogeneity of variances were verified using the Levene's test ($p > 0.05$), ensuring the appropriateness of parametric procedures. When significant differences were identified in ANOVA, the Scheffe post-hoc test was applied to determine specific group differences, as it provides a robust and conservative approach for unequal group sizes (22).

A two-stage analytical strategy was followed for the regression models. Prior to the regression analysis, critical assumptions—including normality of residuals, linearity, homoscedasticity, and the absence of multicollinearity—were verified. Multicollinearity was assessed using the Variance Inflation Factor ($VIF < 10$) and Tolerance (> 0.10) values, while the Durbin-Watson statistic was checked for the independence of errors (22). First, univariable linear regression analyses were performed to identify potential predictors. Variables that demonstrated statistically significant predictive power in the univariable stage were subsequently included in the multiple linear regression analysis using the Enter method to determine their collective and unique effects on the dependent variable (23).

RESULTS

It was found that 52.7% of the participants were female, 81.8% were married, 52.7% were employed, 30.5% had a university degree or higher, 63.5% reported a moderate

level of income, 55.2% resided in the village, 36% were the mothers of the patients, and 83.3% had received information about patient care. The mean age of the participants was 35.29 ± 8.96 years (Table 1).

Descriptive statistics including arithmetic mean, standard deviation, regarding participants' levels of health fatalism and distress tolerance are presented in Table 2. The mean total score for health fatalism among the participants was found to be 53.91 ± 19.12 . The mean total score for distress tolerance was determined as 43.92 ± 14.84 (Table 2).

The normality of the data was examined for each sub-group of the independent variables. The results showed that the skewness values ranged from -0.848 to 1.308, and the kurtosis values ranged from -1.260 to 0.877. Since these values were within the acceptable range of ± 2.0 , it was concluded that the data followed a normal distribution, and parametric tests (Independent Samples t-test and One-way ANOVA) were subsequently employed (Table 3).

The results of the analysis examining whether participants' health fatalism and distress tolerance scores differed according to their descriptive characteristics are presented in Table 4. There is a statistically significant difference in HFS with a moderate effect size according to gender ($t=3.492$, Skewness=, Kurtosis, $p<0.001$, $\eta^2=0.057$). The significant difference is small in DTS with a small effect size ($t=2.485$, Skewness=, Kurtosis, $p=0.014$, $\eta^2=0.03$). According to gender, women have higher average HFS and DTS scores than men.

A statistically significant difference with a large effect size was found in the DTS based on educational level ($F=11.99$, Skewness=, Kurtosis, $p<0.001$, $\eta^2=0.153$). A significant difference with a small effect size was observed in the DTS ($F=2.729$, Skewness=, Kurtosis, $p=0.045$, $\eta^2=0.04$). According to post-hoc comparison, the scale averages of university graduates were lower than those of high school, middle school, and literate individuals.

A statistically significant difference with a moderate effect size was found in the HFS based on income level ($F=7.906$, Skewness=, Kurtosis, $p<0.001$, $\eta^2=0.073$). A significant difference with a moderate effect size was also observed in the DTS ($F=10.373$, Skewness=, Kurtosis, $p<0.001$, $\eta^2=0.09$). According to post-hoc comparison, the average scale scores of those with low income were lower than those with medium and high incomes. The average scale scores of those with medium income were also statistically significantly lower than those with high incomes.

A statistically significant difference with moderate effect size was found in HFS based on place of residence ($F=6.051$,

Table 1: Distribution of some sociodemographic characteristics of the participants

Variables	Findings (n=203)
	M±Sd.
Age (years)	35.29±8.96
	n (%)
Gender	
Female	107 (52.7)
Male	96 (47.3)
Marital status	
Married	166 (81.8)
Single	37 (18.2)
Educational status	
Illiterate	38 (18.7)
Primary school	56 (27.6)
High school	47 (23.2)
University	62 (30.5)
Employment status	
Employed	107 (52.7)
Unemployed	96 (47.3)
Economic situation	
Poor	32 (15.8)
Moderate	129 (63.5)
Good	42 (20.7)
Place of residence	
Village	33 (16.3)
District	58 (28.6)
City center	112 (55.2)
Prior education on patient care	
Yes	169 (83.3)
No	34 (16.7)
Relationship to the patient	
Mother	103 (36)
Father	21 (32)
Sibling	93 (17.7)
Other	29 (14.3)
Total	203 (100.0)

M: Mean, sd: Standard deviation

Table 2: Distribution of the distress tolerance scale (DTS) and health fatalism scale mean scores

Scales	Findings (n=203)
	M±Sd.
Distress Tolerance Scale (DTS)	43.92±14.84
Health Fatalism Scale (HFS)	53.91±19.12

M: Mean, sd: Standard deviation

Table 3. Skewness and kurtosis values of scales according to variables

Variables		HFS	DTS	
Gender	Female	Kurtosis	-0.892	-0.598
		Skewness	-0.124	0.12
	Male	Kurtosis	-1.108	-1.019
		Skewness	-0.017	-0.026
Educational status	Illiterate	Kurtosis	0.205	-0.463
		Skewness	-0.848	-0.062
	Primary school	Kurtosis	-0.906	-0.661
		Skewness	-0.397	0.014
	High school	Kurtosis	-0.553	-0.841
		Skewness	-0.174	-0.095
	University	Kurtosis	-0.588	-0.956
		Skewness	0.147	-0.1
Marital status	Married	Kurtosis	-0.829	-0.652
		Skewness	-0.275	-0.087
	Single	Kurtosis	-1.085	-0.91
		Skewness	-0.178	-0.14
Employment status	Employed	Kurtosis	-0.897	-0.947
		Skewness	-0.118	-0.073
	Unemployed	Kurtosis	-0.829	-0.422
		Skewness	-0.276	-0.031
Economic situation	Poor	Kurtosis	-1.181	-1.26
		Skewness	-0.013	-0.18
	Moderate	Kurtosis	-0.791	-0.702
		Skewness	-0.462	-0.088
	Good	Kurtosis	-0.505	-0.889
		Skewness	-0.037	-0.174
Place of residence	Village	Kurtosis	-1.03	-0.815
		Skewness	-0.405	0.127
	District	Kurtosis	-0.295	-0.817
		Skewness	-0.591	0.019
	City center	Kurtosis	-0.795	-0.75
		Skewness	-0.032	-0.184
Relationship to the patient	Mother	Kurtosis	-0.761	-0.47
		Skewness	-0.252	-0.032
	Father	Kurtosis	-0.954	-0.705
		Skewness	-0.202	-0.003
	Sibling	Kurtosis	-0.643	-0.485
		Skewness	0.163	-0.038
	Other	Kurtosis	0.877	-0.097
		Skewness	1.308	0.876
Prior education on patient care	Yes	Kurtosis	-0.86	-0.69
		Skewness	-0.184	-0.181
	No	Kurtosis	-1.068	-0.932
		Skewness	-0.443	-0.233

Skewness=, Kurtosis, $p=0.003$, $\eta^2=0.057$). According to post-hoc comparison, the average scale scores of those living in villages and districts were higher than those living in cities.

A statistically significant difference with moderate effect size was found in DTS based on receiving training related to illness care ($t=3.824$, Skewness=, Kurtosis, $p<0.001$, $\eta^2=0.068$). The average scale scores of those who received training were higher than those who did not. No statistically significant difference was found in HFS based on receiving training related to illness care ($p>0.05$). A statistically significant difference with a moderate effect size was found in HFS according to kinship status ($F=29.906$, Skewness=, Kurtosis, $p<0.001$, $\eta^2=0.309$). A significant difference with a large effect size was also found in DTS ($F=31.762$, Skewness=, Kurtosis, $p<0.001$, $\eta^2=0.324$). According to post-hoc comparison, the mean scale scores of those whose kinship status was mother, father, or sibling were higher than the mean scores of those who stated otherwise (Table 4).

Before applying the multiple linear regression model, the variables were tested with univariate models. The univariate analysis revealed that all variables except marital status ($p=0.479$) and employment status ($p=0.533$) were statistically significant predictors of the DTS scale. The multiple linear regression model constructed with the variables found to be significant at this stage was statistically significant ($F=28.66$, $p<0.001$). The model explained 52.3% of the total variance on the DTS scale ($R_{adj}=0.523$; Table 5).

When examining the specific contributions of the independent variables to the model, it was observed that gender ($B=-5.118$, $p=0.014$) and place of residence ($B=-3.049$, $p=0.028$), which were significant in the univariate model, lost their effects in the multiple regression model when other variables were controlled for ($p=0.464$, $p=0.865$).

The strongest positive predictor of the model was the HFS scale ($B=0.295$, 95% CI[0.2, 0.4], $\beta=0.380$, $t=5.87$, $p<0.001$). Each 1-unit increase in the HFS score led to a 0.295-unit increase in the DTS score. The second strongest predictor, consanguinity, had a negative effect on DTS ($B=-13.34$, 95% CI[-18.2, -8.5], $\beta=-0.315$, $t=-5.393$, $p<0.001$). Participants whose consanguinity status was ‘Other’ had DTS scores that were, on average, 13.34 units lower than those whose consanguinity was a mother, father, or sibling. Age is the third strongest positive significant predictor of DTS ($B=0.221$, 95% CI[0.05, 0.4], $\beta=0.133$, $t=2.428$, $p=0.016$). A one-unit increase in age increased the distress tolerance score (DTS) by 0.221 units. Patient care training is the fourth strongest negative and significant predictor of DTS ($B=-6.739$, 95% CI[-10.6, -2.9], $\beta=-0.170$, $t=-3.440$, $p=0.001$). Those who

Table 4. Comparison of HFS and DTS scores across independent variables

	HFS	Test and Significant	η^2	DTS	Test and Significant	η^2
Age*		r:0.408 p<0.001			r:0.388 p<0.001	
HFS					r:0.626 p<0.001	
	Mean±SD			Mean±SD		
Gender						
Female	58.2±16.3	t:3.492	0.057	46.3±13	t:2.485	0.03
Male	49.1±20.9	p<0.001		41.2±16.3	p:0.014	
Marital status						
Married	54.9±19.6	t:1.533		44.3±14.9	t:0.709	
Single	49.6±16.3	p:0.089		42.4±14.6	p:0.479	
Educational status						
Illiterate ⁽¹⁾	62.5±17.6	F:11.99	0.153	46.6±14.6	F:2.729	0.04
Primary school ⁽¹⁾	58.8±18.8	p<0.001		45.7±14.5	p:0.045	
High school ⁽¹⁾	55.3±16.7	1.2.3>4**		45.4±14.1	1.2.3>4**	
University ⁽²⁾	43.2±17.6			39.5±15.2		
Employment status						
Employed	51.6±20.1	t:-1.845		43.3±16.4	t:-0.625	
Unemployed	56.5±17.8	p:0.067		44.6±12.9	p:0.533	
Economic situation						
Poor ⁽¹⁾	60.2±18	F:7.906	0.073	54.2±13	F:10.373	0.090
Moderate ⁽²⁾	55.5±19.7	p<0.001		42.5±14.8	p<0.001	
Good ⁽³⁾	44.4±14.5	1>2.3; 2>3**		40.4±13	1>2.3; 2>3**	
Place of residence						
Village ⁽¹⁾	60.1±19	F:6.051	0.057	48.7±14	F:2.539	
District ⁽¹⁾	58.2±18.6	0.003		44.4±15	0.082	
City center ⁽²⁾	49.8±18.6	1>2**		42.2±14.8		
Prior education on patient care						
Yes	54.8±19.1	t:1.438		45.6±14.8	t:3.824	
No	49.6±19.1	0.152		35.3±11.9	p<0.001	0.068
Relationship to the patient						
Mother ⁽¹⁾	59.5±15.5	F:29.726	0.309	47.0±11.9	F:31.762	0.324
Father ⁽¹⁾	59.9±17.4	p<0.001		48.2±13.8	p<0.001	
Sibling ⁽¹⁾	51.7±15.1	1>2**		46.5±12.9	1>2**	
Other ⁽²⁾	29.0±15.1			23.3±8.2		

Data shown as mean and standard deviation, * Pearson correlation coefficient p value. F: ANOVA, t: Independent-Samples t test, ** Scheffe post-hoc test was used for multiple comparisons due to unequal group sizes, η^2 : Effect size, **HFS**: Health Fatalism Scale, **DTS**: Distress Tolerance Scale

did not receive patient care training had DTS scores that were, on average, 6.739 units lower than those who did receive training. Economic income level is the fifth-ranked negative and significant predictor of the Distress Tolerance Score (DTS) (B=-3.933, 95% CI[-6.6, -1.3], β =-0.160, t=-2.952, p=0.004). A one-unit increase in economic income

level reduced the Distress Tolerance Score (DTS) by 3.933 units. Education level is the sixth-ranked negative and significant predictor of the DTS (B=-1.695, 95% CI[-3.2, -0.2], β =-0.126, t=-2.184, p=0.03). A one-unit increase in education level reduced the Distress Tolerance Score (DTS) by 1.695 units (Table 5).

Table 5. Regression analyze for DTS

	Univariable		Multivariable						
	B (LB-UB)	p	B	SH	LB	UB	β	t	p
(Constant)			27.77	5.7	16.5	39.1		4.843	0
HFS	0.486(0.4, 0.57)	p<0.001	0.295	0.1	0.2	0.4	0.380	5.87	p<0.001
Relationship to the patient (RC: Mother, Father, Sibling; 1: Other)	-5.943(-7.73, -4.16)	p<0.001	-13.34	2.5	-18.2	-8.5	-0.315	-5.393	p<0.001
Age	0.642(0.43, 0.86)	p<0.001	0.221	0.1	0.05	0.4	0.133	2.428	0.016
Prior education on patient care (RC: Yes, 1:No)	-10.321(-15.6, -5)	p<0.001	-6.739	2.0	-10.6	-2.9	-0.170	-3.440	0.001
Economic situation (1:Poor, 2:Moderate, 3:Good)	-6.519(-9.82, -3.22)	p<0.001	-3.933	1.3	-6.6	-1.3	-0.160	-2.952	0.004
Educational status (1:Illiterate, 2:Primary, 3:High, 4:University)	-2.338(-4.18, -0.5)	0,013	-1.695	0.8	-3.2	-0.2	-0.126	-2.184	0.030
Gender (RC: Female, 1:Male)	-5.118(-9.18, -1.06)	0,014	-1.151	1.6	-4.2	1.9	-0.039	-0.733	0.464
Place of residence (1:Village, 2:District, 3:City center)	-3.049(-5.76, -0.34)	0,028	-0.18	1.1	-2.3	1.9	-0.009	-0.17	0.865
Marital status	-1.914(-7.24, 3.41)	0,479							
Employment status	1.305(-2.81, 5.43)	0,533							

R:0.736, R²:0.542, R^a:0.523, F:28.66, p<0.001, df1:8, df2:194, Durbin Watson:2.377, VIF:1.034-1.778, Tolerance:0.562-0.967

B: Unstandardized beta, SH: Standard error, LB-UB: Lower – upper bound confidence interval for B, β: Standardized beta, t: Independent – sample t test, Ra: Adjusted R2, F: ANOVA, VIF: Variance Inflation Factor, RC: Reference category

DISCUSSION

This section discusses the findings obtained to determine the relationship between the health fatalism beliefs and distress tolerance levels of caregivers of individuals with type 1 diabetes mellitus, in light of relevant literature.

The study revealed that caregivers of patients exhibited high levels of health fatalism. This finding may reflect an adaptive cognitive framework through which caregivers make sense of the uncertainties and emotional burden associated with chronic illness. In contexts where caregiving involves prolonged stress and limited control over outcomes, fatalistic beliefs may help individuals accept their circumstances, thereby reducing psychological strain and promoting emotional stability. Consistent with this interpretation, a 2024 study conducted in China reported similarly high levels of health fatalism among caregivers. Additionally, previous research has indicated that individuals caring for patients with chronic illnesses may cope more effectively with negative situations and experience a reduced caregiving burden when they hold strong fatalistic beliefs. This suggests that fatalism may serve as a coping resource by fostering acceptance, meaning-making, and emotional regulation in the face of ongoing challenges (24). Another study also reported that individuals providing care for patients with chronic

illnesses were more likely to cope with negative situations and alleviate their caregiving burden when they held strong fatalistic beliefs (25). However, it is important to approach this finding with caution. While fatalistic beliefs may provide short-term psychological relief, they could also discourage proactive health behaviors or limit problem-focused coping in certain situations. Therefore, the role of health fatalism in caregiving should be understood as complex and context-dependent, potentially offering both adaptive and maladaptive implications depending on how such beliefs are integrated into caregivers’ coping processes.

The present study found that female caregivers had significantly higher health fatalism scores than males. This difference may be associated with gender-based variations in religious orientation, meaning-making processes, and coping styles. In many cultural contexts, women tend to engage more deeply with spiritual or religious frameworks, which may strengthen fatalistic interpretations of health and illness. Such beliefs can provide a sense of acceptance and emotional relief when facing the uncertainties of caregiving. However, the literature presents inconsistent findings. A 2024 study reported higher health fatalism scores among men, emphasizing the potential role of religious leaders in promoting positive religious coping and shaping constructive perceptions of fatalism among caregivers. In contrast,

another study yielded results consistent with the present findings, indicating that women reported higher levels of health fatalism than men (25). In contrast, another study yielded results consistent with the present findings, indicating that women reported higher levels of health fatalism than men (15). These discrepancies suggest that gender differences in health fatalism are not uniform and may be shaped by sociocultural norms, religious practices, and differences in how men and women internalize and express belief systems. Additionally, variations in sample characteristics and measurement approaches may contribute to these conflicting results.

A statistically significant negative relationship was found between educational level and health fatalism scores, indicating that higher educational attainment is associated with lower levels of fatalistic beliefs. This finding may be explained by the role of education in enhancing individuals' access to information, critical thinking skills, and perceived control over health-related outcomes. As education increases, individuals may be more likely to adopt a proactive and problem-focused approach to health, thereby reducing reliance on fatalistic interpretations.

Consistent with this result, a study conducted in Türkiye reported that individuals with lower educational attainment tended to exhibit higher levels of health fatalism. This pattern suggests that limited access to knowledge and resources may reinforce beliefs that health outcomes are predetermined or beyond individual control (15). This pattern suggests that limited access to knowledge and resources may reinforce beliefs that health outcomes are predetermined or beyond individual control. However, the relationship between education and fatalism should not be interpreted solely as a deficit among less educated individuals. In some contexts, fatalistic beliefs may serve as a culturally embedded coping mechanism that helps individuals manage uncertainty and emotional burden, particularly in situations where control is objectively limited, such as chronic illness caregiving (26,27). Therefore, these findings underscore the importance of adopting a balanced approach in caregiver support interventions. Rather than attempting to eliminate fatalistic beliefs entirely, it may be more effective to promote adaptive coping strategies and health literacy while acknowledging the potential psychological comfort that such beliefs can provide.

The finding that participants with lower income levels had significantly higher health fatalism scores is particularly noteworthy. This relationship may reflect the impact of socioeconomic constraints on individuals' perceived control over life circumstances. Limited financial resources can restrict access to healthcare, information, and sup-

port services, potentially reinforcing the belief that health outcomes are largely determined by external forces rather than personal agency (28). Similar results were reported in a study conducted in Türkiye among caregivers of various patient populations, where individuals with lower income had higher fatalism (29). At the same time, elevated fatalistic beliefs may have complex implications. While they can provide short-term emotional relief, they may also limit engagement in proactive health behaviors or reduce motivation to seek available resources. Therefore, the relationship between income and health fatalism appears to be shaped by both structural inequalities and coping processes.

These findings highlight the importance of addressing socioeconomic disparities in caregiver support programs. Interventions should not only aim to reduce maladaptive aspects of fatalism but also enhance access to resources, strengthen perceived control, and support more active coping strategies among caregivers with limited financial means. In addition, participants living in urban centers had lower health fatalism scores compared to those residing in towns and rural areas. This difference may be attributed to disparities in access to healthcare services, educational opportunities, and health-related information. Urban environments often provide greater exposure to medical knowledge, professional support, and alternative coping resources, which may foster a stronger sense of personal control over health outcomes and reduce reliance on fatalistic beliefs. Consistent with this interpretation, a study conducted in China reported that limited access to health-related information in rural areas may contribute to a more fatalistic worldview. However, this relationship should be understood within a broader structural context. Higher fatalism in rural settings may not merely reflect informational deficits, but also the realities of reduced service availability, geographic isolation, and fewer opportunities for timely intervention. In such contexts, fatalistic beliefs may serve as a coping mechanism that helps individuals manage uncertainty and limited control (30). Therefore, the association between place of residence and health fatalism underscores the need for context-sensitive interventions. Efforts to reduce fatalistic beliefs should be accompanied by strategies aimed at improving healthcare accessibility, expanding outreach services in rural areas, and increasing health literacy, while also recognizing the adaptive psychological functions that such beliefs may serve in resource-constrained environments.

The study also revealed that mothers, fathers, and siblings of patients exhibited higher health fatalism scores compared to more distant relatives. This pattern may reflect the intensity of caregiving responsibilities and the emotional closeness inherent in first-degree familial relationships. Pri-

mary caregivers often experience prolonged exposure to patient needs, significant time demands, and heightened emotional burden, which can amplify feelings of powerlessness and reduce perceived control over health outcomes. A study conducted in Türkiye in 2024 with 132 caregivers, it was also found that first-degree relatives had high health fatalism scores, in line with the present findings. The study further reported that most of the participants were mothers, experienced a high level of caregiving burden, and often relied on fate to cope with this burden (25). These results suggest that the closeness of the caregiver-patient relationship is a critical factor influencing fatalistic beliefs. While fatalism may provide psychological relief, it may also signal that caregivers feel constrained in their ability to influence outcomes, highlighting the need for interventions that empower primary family caregivers through education, emotional support, and access to practical resources. Addressing these needs could help balance the adaptive and potentially limiting aspects of fatalistic coping among first-degree relatives.

The study also revealed a positive association between age and health fatalism, indicating that older caregivers tend to report higher fatalistic beliefs. Similar findings were reported in a study conducted in Egypt in 2023 with 200 participants. That study indicated that fatalistic beliefs are deeply embedded in Egyptian culture, and that older individuals facing chronic illnesses may perceive death as inevitable, leading them to believe in fate, luck, destiny, or predetermined health outcomes (31). Supporting this perspective, a 2020 study from Türkiye also found that health fatalism increases with age (15). Similarly, a 2025 study from China reported not only that health fatalism increases among older adults, but also that higher fatalism levels among caregivers were associated with increased tendencies toward pessimism (30). This pattern may reflect cumulative life experiences and prolonged exposure to health-related uncertainties, which could reinforce the perception that health outcomes are largely predetermined or beyond individual control. Older caregivers may have witnessed more instances where illness progression or outcomes could not be influenced despite best efforts, strengthening reliance on fate as a coping mechanism.

Participants in the present study demonstrated high levels of distress tolerance. This finding not only reflects caregivers' capacity to endure challenging emotional situations, but also points to the potential development of adaptive coping mechanisms shaped by the ongoing demands of caregiving. Prolonged exposure to illness-related stressors may contribute to increased psychological endurance, allowing caregivers to manage distress more effectively over time. Consistent with this result, a 2025 study conducted in India

using the same distress tolerance scale similarly reported high distress tolerance levels among caregivers. The authors emphasized the importance of community-based support groups, suggesting that even individuals with high distress tolerance may benefit from structured opportunities to express their emotional concerns (32). This highlights that high distress tolerance does not eliminate the need for psychosocial support; rather, it may coexist with unexpressed emotional burden. Taken together, these findings suggest that while caregivers may appear resilient in terms of distress tolerance, supportive interventions remain essential to ensure their long-term psychological well-being. Therefore, high distress tolerance should be interpreted not only as a strength, but also as a potential indicator of suppressed or unaddressed emotional needs.

The findings indicated that female participants had significantly higher distress tolerance scores than male participants. This gender difference may be explained by variations in coping styles and emotional processing. Women are often reported to engage more frequently in emotion-focused coping strategies, such as seeking social support, cognitive reappraisal, and emotional expression, which may enhance their ability to tolerate distress in prolonged caregiving contexts. However, the literature presents mixed findings. A 2024 study conducted in the United States reported higher distress tolerance levels among male caregivers, suggesting that cultural norms, gender roles, and differing expectations regarding emotional expression may influence how distress tolerance is experienced and reported. In contrast, a 2024 study conducted in Türkiye with 533 participants yielded results consistent with the present study, indicating that women were more likely to utilize coping strategies to manage depressive symptoms, thereby supporting more effective distress regulation (33). In contrast, a 2024 study conducted in Türkiye with 533 participants yielded results consistent with the present study, indicating that women were more likely to utilize coping strategies to manage depressive symptoms, thereby supporting more effective distress regulation (34). These inconsistencies across studies highlight the importance of considering sociocultural context when interpreting gender differences in distress tolerance. It is possible that in certain cultural settings, women's greater engagement in adaptive coping strategies strengthens their resilience, whereas in other contexts, men may report higher tolerance due to social norms that discourage the expression of distress. Therefore, rather than suggesting a universally higher resilience among female caregivers, these findings point to the context-dependent nature of distress tolerance and underscore the need for gender-sensitive approaches in caregiver support interventions.

The study revealed that higher education levels were associated with lower distress tolerance scores among participants. This finding may initially appear counterintuitive, as education is often linked to increased access to resources and more effective coping skills. However, it may also reflect greater awareness and sensitivity to stressors among more educated individuals, leading to lower perceived tolerance for distress. In other words, individuals with higher education may be more likely to recognize, label, and report distress rather than endure it without acknowledgment. The literature presents mixed evidence on this issue. A 2025 study conducted in Switzerland found no significant relationship between education level and distress tolerance, suggesting that this association may not be universal (35). In contrast, a 2024 study from Türkiye reported findings consistent with the present study, indicating that individuals with lower education levels had higher distress tolerance scores. The authors argued that limited access to resources may lead these individuals to adopt more passive or submissive coping strategies, which could be interpreted as higher distress tolerance, although it may actually reflect constrained coping options rather than genuine psychological resilience (36). These contrasting findings highlight the need to interpret distress tolerance scores cautiously. Higher tolerance may not indicate better psychological functioning; in some cases, it may represent habituation to adversity or a lack of alternative coping mechanisms. Therefore, the observed relationship between education and distress tolerance is likely shaped by a combination of cognitive, cultural, and socioeconomic factors, underscoring the importance of contextualizing such findings within broader social and structural conditions.

The study found that participants with a low-income level had higher distress tolerance scores. Distress tolerance improves quality of life, assists with time management, and helps divert negative thoughts (16). Contrary to these findings, a 2024 study conducted in Türkiye reported no significant differences in distress tolerance scores by income level (36). Furthermore, a 2025 study conducted in Boston, USA, with low-income participants highlighted the regulatory role of distress tolerance in mitigating depressive moods during stress management (37). It is believed that individuals with low income develop stronger coping skills due to financial hardships, which contribute to their higher distress tolerance levels. Although high distress tolerance has been observed in low-education and low-income groups, this should not be interpreted as an indicator of psychological resilience alone. The literature suggests that high distress tolerance in socioeconomically disadvantaged individuals may often stem from compulsory adaptation, avoidance,

or coping strategies in stressful situations (38). Therefore, even when high distress tolerance is observed, generalizing it as a positive trait without considering it in conjunction with individuals' psychological well-being and quality of life is debatable.

The study also revealed that distress tolerance scores were higher among parents and siblings of the patient compared to other relatives. This may be explained by the increased sense of responsibility and caregiving effort associated with closer kinship, which in turn raises distress tolerance levels. This finding aligns with previous research. For instance, a 2023 study in Italy involving 605 patient relatives reported that siblings who supported the patient during challenging periods experienced improved mental health and higher distress tolerance levels (39). Thus, the well-being and high distress tolerance of family members, particularly parents, are crucial for providing better care for their children.

Participants who received caregiving-related education demonstrated higher distress tolerance scores. Providing care to a loved one is a highly stressful process that can lead to psychiatric and physical health problems, increasing caregivers' anxiety levels (40). The literature highlights the importance of education in reducing caregiver anxiety and burden, improving quality of life, and emphasizes the planning, implementation, and evaluation of nursing interventions related to caregiving education (41). A study conducted in Türkiye in 2022 similarly found that receiving education for caregiving reduced caregiver burden, provided psychological relief, and increased distress tolerance levels (42). Considering caregivers' personal histories, life experiences, and psychological changes, individualized support and educational programs should be developed.

Caregivers' higher levels of health fatalism were found to be significantly associated with increased distress tolerance. Beyond simply indicating a positive relationship, this finding suggests that fatalistic beliefs may function as a psychological coping mechanism in the caregiving context. In particular, perceiving health outcomes as predetermined or guided by a higher power may reduce caregivers' perceived personal burden and uncertainty, thereby enabling them to endure stressful situations more effectively (36). Likewise, findings from a 2024 study in China indicate that higher levels of health fatalism among caregivers can enhance both patient and family motivation in disease management and strengthen coping capacities during challenging caregiving processes. Taken together, these studies suggest that health fatalism, when rooted in cultural or spiritual frameworks, may play a protective role by fostering hope, reducing anxiety related to uncertainty, and supporting sustained care-

giving efforts (24). Therefore, rather than being viewed solely as a maladaptive belief system, health fatalism may, under certain conditions, contribute positively to caregivers' psychological adjustment by enhancing their tolerance for distress.

The study found that caregivers of patients with type 1 diabetes exhibited high levels of both health fatalism and distress tolerance. Additionally, it was determined that as the health fatalism levels of caregivers increased, their distress tolerance levels also increased. Based on these results, it is recommended that during the treatment process of patients with type 1 diabetes, the needs and problems of caregivers be identified with attention to their cultural and religious context. Spiritual interventions should be used to enhance the positive effects of fatalism on health outcomes, and person-centered self-management programs consistent with the motivation of the patient and family should be developed. Furthermore, fostering collaboration between caregivers of type 1 diabetic patients and healthcare professionals can facilitate the expression and resolution of problems when faced with adverse disease-related situations. This collaboration may also help caregivers, especially those who are parents, overcome role conflicts arising from

their close relationship with the patient. Additionally, it is suggested that similar studies be conducted using different methods and larger sample sizes.

There are some limitations to the study that need to be considered. Firstly, this study is a cross-sectional study. More large-scale longitudinal studies are needed to investigate the causal relationships of the findings. Furthermore, the study's cross-sectional nature may limit the generalisability of findings to other populations or regions. Additionally, the study is limited to patients attending the endocrinology outpatient clinic of a single public hospital.

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Author's Contributions

Concept: **Gülden Atan, Yavuz Üren, Veysel Can, Mehmet Bulduk**, Design: **Gülden Atan, Yavuz Üren, Veysel Can, Mehmet Bulduk**, Supervision: **Gülden Atan, Yavuz Üren, Veysel Can, Mehmet Bulduk**, Resoucers: **Gülden Atan, Yavuz Üren, Veysel Can, Mehmet Bulduk**, Materials: **Gülden Atan, Veysel Can**, Data Collection and/ or Processing: **Veysel Can**, Analysis and/ or Interpretation: **Gülden Atan**, Literature Search: **Gülden Atan**, Writing Manuscript: **Gülden Atan, Yavuz Üren**, Critical Review: **Gülden Atan, Yavuz Üren, Veysel Can, Mehmet Bulduk**.

Conflict of Interest

The authors declare that they have no conflict of interest. This manuscript has not previously been published elsewhere.

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Ethics Committee Approval

Ethical approval was obtained from the Ethics Committee of Van Yuzuncu Yil University Türkiye (Dated: 24.06.2024, Numbered: 2024/07-10), along with permission from the hospital where the study was carried out. Prior to data collection, the purpose of the study was explained to the participants and informed consent was obtained. The study was conducted in accordance with the Declaration of Helsinki.

Peer Review Process

Extremely and externally peer-reviewed.

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