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# Examining religious attitudes and mental well-being in post-earthquake trauma

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#### **Abstract**

**Background:** Natural disasters, such as earthquakes, can traumatize survivors and affect various aspects of their lives, including mental health and quality of life. This study explores religious attitudes, mental well-being, and post-earthquake trauma among female survivors of the 2023 Kahramanmaraş earthquake in Türkiye.

Methods: This cross-sectional study was conducted from 18 May to 18 June 2023, involving 618 female survivors aged 18 and older affected by the 2023 Kahramanmaraş Earthquake. Participants voluntarily completed an online survey via social media platforms and group forums. The data were collected using a "sociodemographic form," "The Ok-Religious Attitude Scale," "The Warwick-Edinburgh Mental Well-being Scale," and "Post-Earthquake Trauma Level Determination Scale." Data analysis was conducted using SPSS 25.0. Descriptive statistics were presented using numbers, percentages, means, and standard deviations. Independent samples t-tests and one-way ANOVA were conducted to compare the means between groups. Pearson's correlation was used to assess relationships between continuous variables, and linear regression was performed for further analysis. The significance level for all analyses was set at p < 0.05.

**Results:** Female survivors demonstrated strong religious beliefs, maintained good mental well-being, and reported below-average levels of post-earthquake trauma. A significant positive relationship was found between women's religious attitudes and mental well-being (r=0.57, p=0.0001). Additionally, there was a significant positive relationship between religious attitudes and trauma levels (r=0.20, p=0.0001). Furthermore, mental well-being and trauma levels were significant predictors of religious attitudes.

**Conclusion**: Healthcare professionals should consider the role of religious beliefs in coping with trauma and maintaining mental well-being in counseling, intervention, and support strategies.

#### **Article History**

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# Highlights

# What is current knowledge?

Natural disasters, such as earthquakes, profoundly affect survivors, particularly women, influencing their mental health and quality of life. Religious beliefs have been shown to help individuals cope with trauma and enhance their mental well-being.

## What is new here?

This study demonstrated a positive correlation between religious attitudes, mental well-being, and post-earthquake trauma levels in female survivors. It also identified mental well-being and trauma as predictors of religious attitudes, highlighting the importance of religious beliefs in post-trauma support.

# Introduction

Earthquakes are a global issue, and their incidence and intensity have increased. They inflict severe economic, social, environmental, physical, and psychological damage on individuals and society (1). Literature indicates that earthquakes have a particularly negative impact on women's health, making them more susceptible to mental disorders during such crises (1,2). Although post-earthquake responses often focus on physical needs such as shelter, nutrition, and hygiene, addressing mental health issues such as anxiety, fear, and trauma is equally essential. Although the mental impacts of earthquakes are often overlooked, they play a significant role in recovery (3,4).

The sudden occurrence of an earthquake and subsequent aftershocks can hinder individuals from resuming their everyday lives. Survivors of a devastating natural disaster may experience severe trauma due to the overwhelming and uncontrollable nature of the event (5). Earthquake survivors, particularly women, often experience long-term psychological consequences such as traumatic and anxiety disorders, which are more severe compared to other disasters (6). Trauma is defined as a situation resulting from exposure to a life-threatening event that causes psychological stress (7). It is also defined as the harmful effect of an event that threatens the individual's or others' life, which may cause serious injuries (8). Women, children, the elderly, minorities, immigrants, people from low socioeconomic status, individuals with inadequate coping methods, and those with a history of trauma or psychiatric illnesses in themselves or their families

are more vulnerable to trauma (9,10). Constant vigilance for potential earthquakes, challenges in resuming normal routines, uncertainty, fear, anxiety, and burnout can become pervasive in society, leading to the widespread impacts of trauma. Therefore, assessing the trauma individuals experience after an earthquake is crucial for individual and public health (11).

In this context, mental and religious attitudes may serve as important coping mechanisms, influencing individuals' mental health post-earthquake. Studies show that exposure to psychological trauma can lead to consequences such as depression, anxiety, and stress and influence individuals' well-being (11,12). It is documented that natural disasters such as earthquakes may lead to intellectual and spiritual consequences and psychological effects. A study highlighted that during the COVID-19 epidemic, individuals' feelings of solidarity increased, and they recalled spiritual values and the reality of death. This experience altered life priorities and intensified religious practices (12). Similarly, after earthquakes, survivors may turn to religion for solace, using religious attitudes to cope with trauma. An uncontrollable event that leaves individuals helpless prompts them to seek divine assistance in a metaphysical sense (13). It has been documented that people visited mosques in large numbers to pray and seek comfort days and even weeks after the destructive Marmara earthquake in Türkiye (11). There is evidence that individuals with religious coping skills experience less stress, depression, and fear (14,15). One study found that individuals became more oriented towards religion or spirituality after testing positive for COVID-19. They prayed more during the coping process, questioned the meaning of life, and contemplated death. The belief in a supreme power and religious practices also provided comfort (16).

Spiritual health and mental well-being are important aspects of many religions. Spirituality is generally characterized as a person's beliefs and behaviors influenced by their connection with God or a supreme power (17). Through faith, people have alleviated pain and overcome disasters, helplessness, fear, and sorrow. Faith helps individuals make sense of their lives and provides hope, consolation, and confidence. The study of survivors of the 2004 Aceh Earthquake and Tsunami revealed that religion played a significant role in the victims' recovery from disaster trauma. Religious beliefs, prayers, rituals, and participation in faith-based community activities provide emotional support, solace, and strength to continue life and aid recovery (5). It has been reported that earthquake survivors frequently prayed to God to enhance their mental wellbeing and that prayer had a positive psychological effect (18). A systematic review and meta-analysis of the 2010 Haiti earthquake indicated that practices that increase spirituality generally protected against post-traumatic stress disorder. Those with lower intrinsic religious orientation and church attendance

rates had a higher risk of post-traumatic stress disorder (19). Moreover, religion has been described as an effective coping strategy for post-earthquake trauma victims to recover from negative psychological effects (5,11). However, few studies assessed the levels of religious attitude, mental well-being, and post-earthquake trauma in the earthquake-affected regions where the relevant studies were conducted. Therefore, this research aimed to examine female earthquake survivors' religious attitudes, mental well-being, and post-earthquake trauma.

## Methods

## Study design

This study had a descriptive and correlational design. It was conducted from May 18 to June 18, 2023, involving women aged 18 and older residing in Elazığ, a province impacted by the Kahramanmaras earthquake on February 6, 2023. The sample consisted of 618 female survivors, who were reached by snowball sampling and filled out the questionnaire online via Google Forms. The sample size was calculated using G\*Power, with the following parameters:  $\alpha = 0.05$ , a 95% confidence interval, an effect size of 0.12 (Small), and 90% power for a ttest analysis. Based on this calculation, the required sample size was 588 survivors. The study was completed with 618 female survivors to account for potential data loss. The study focused on survivors of the Kahramanmaras Earthquake in Türkiye, a devastating disaster that occurred on February 6, 2023, with magnitudes of 7.7 and 7.6. This earthquake severely impacted 11 provinces, including Kahramanmaraş, Hatay, Gaziantep, Adıyaman, Malatya, Şanlıurfa, Kilis, Osmaniye, Diyarbakır, Adana, and Elazığ, resulting in widespread devastation and significant loss of life. Data were collected through an online survey created by the researchers and disseminated via social media platforms, including Facebook and Instagram, as well as group forums. Participants voluntarily completed the survey between 18 May and 18 June 2023, ensuring accessibility for individuals affected by the earthquake regardless of location. The online format allowed for widespread reach and convenience, enabling participants to provide their responses voluntarily and anonymously. This approach was chosen to facilitate data collection from a diverse sample of survivors while respecting their circumstances and privacy.

#### Inclusion criteria

The study included women 18 years or older who had no visual impairment or diagnosed psychiatric illness, were open to communication and cooperation, were willing to participate voluntarily, and had experienced an earthquake. The above criteria were verified based on the participants' statements. Survivors entered the study between May 18 and June 18, 2023, approximately three to four months after the 2023 Kahramanmaraş earthquake.

The study excluded women under 18, those who did not reside in Turkey, and individuals who failed to complete the questionnaire forms.

## Data collection tools

Data collection tools included a sociodemographic information form, the Ok-Religious Attitude Scale, the Warwick-Edinburgh Mental Well-Being Scale, and the Scale for Determining the Level of Post-Earthquake Trauma.

# Sociodemographic information form

This form, prepared by the researchers based on the literature, consisted of six questions assessing age, marital status, family type, educational status, employment status, and perceived income (20,21).

#### The Ok-religious attitude scale

The Religious Attitude Scale was developed by Ok (2011) to be used in the fields of psychology of religion and sociology of religion (22). The Ok-Religious Attitude Scale is a five-point Likert-type scale comprising eight items and four sub-dimensions (Cognition, emotion, behavior, and God). The scale is scored as follows: 1.00-1.49= very little or not at all religious (Very much/entirely secular), 1.50-2.49= a little religious (Very secular), 2.50-3.49= moderately religious (Moderately secular), 3.50-4.49= very religious (Little secular), 4.50-5.00=very religious or absolute believer (Very little/not at all secular). The Cronbach alpha internal consistency reliability coefficient was reported as 0.90 for the whole scale and 0.87, 0.85, 0.75, and 0.86 for the sub-dimensions, respectively (22,23). The Cronbach alpha coefficient of the scale in this study was 0.91. These values ranged between 0.89 and 0.94 for its sub-dimensions.

# The Warwick-Edinburgh Mental Well-being Scale (WEMWBS)

WEMWBS was created by Tennant and colleagues in 2007 to assess individuals' levels of mental well-being. It consists of fourteen items and assesses individuals' positive mental health by covering psychological and subjective well-being. The scale is a five-point Likert scale with a minimum score of 14 and a maximum score of 70. The scoring system is as follows: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Higher scores on the scale indicate higher levels of mental (Psychological) well-being (24). Its Turkish validity and reliability study was conducted by Keldal (2015), and the Cronbach alpha coefficient was reported as 0.89 (25). The Cronbach alpha coefficient of the scale in this study was 0.96.

## Post-Earthquake Trauma Level Determination Scale (PETLDS)

PETLDS was developed by Tanhan and Kayri (2013) and consists of 20 five-point Likert-type items (1=strongly disagree, 5=strongly agree). Likert style statements are "strongly disagree," "slightly agree," "moderately agree," "strongly agree," and "completely agree." The scale score ranges from 20 minimum to 100 maximum. The higher the scores, the more significant the impact of the earthquake. The Cronbach's alpha coefficient of the original scale was reported as 0.87 (8). It was 0.95 in this study.

## Data analysis

The data were analyzed using the SPSS 25.0 software. Descriptive features were analyzed using frequencies, percentages, means, and standard deviations. The suitability of the data for normal distribution was evaluated with skewness and kurtosis values. The data followed a normal distribution. For statistical tests, ttests and one-way ANOVA were used for independent groups. The Tukey test, one of the post-hoc tests, was used to determine which groups caused the differences. Pearson's correlation was used to evaluate the relationship between the scales, and linear regression was performed for further analysis. All analyses were conducted with a significance level set at p < 0.05 (26).

# Results

The participants' ages ranged between 18 and 55, with a mean of  $31.42\pm9.72$  per the distribution of their personal information (Table 1). 62.9% were single, while 72.3% had a nuclear family. 57.0% had a university degree or higher, while 62% did not work. A comparison of the mean scores according to the women's characteristics revealed that the mean scores did not differ significantly according to marital status, family type, or educational status.

Table 1. Participant demographic characteristics and comparison of OK-RAS, WEMWBS, and PETLDS scores

		%	OK-RAS		WEMWBS		PETLDS		
Characteristics	Number		Mean (SD)	Analysis	Mean (SD)	Analysis	Mean (SD)	Analysis	
	Age (Min-max: 18-55, mean±SD: 31.42±9.72)								
18-25 a	203	32.8	3.75 (1.00)	F=43.53	37.32 (12.31)	F=310.53	55.14 (17.25)		
26-34 <sup>b</sup>	234	37.9	4.13 (0.64)	p=0.0001 Differences	48.80 (7.79)	p=0.0001 Differences	52.74 (15.10)	F=1.13 p=0.322	
35 and above <sup>c</sup>	181	29.3	4.52 (0.71)	c>b>a	61.83 (8.21)	c>b>a	53.75 (17.83)	p 0.322	
	Marital status								
Single	389	62.9	4.09 (0.86)	t=-1.21	48.70 (14.03)	t=-0.34	53.08 (16.18)	t=-1.45	
Married	229	37.1	4.17 (0.82)	p=0.227	49.10 (12.90)	p=0.727	55.09 (17.39)	p=0.147	
			Fa	mily structure					
Nuclear	447	72.3	4.09 (0.93)	t=-0.48	48.46 (14.45)	t=-0.43	53.23 (18.73)	t= -0.51	
Extended	171	27.7	4.13 (0.82)	p=0.627	49.00 (13.29)	p=0.661	54.05 (15.80)	p= 0.610	
			E	ducation level					
High school or lower	266	43.0	4.14 (0.83)	t=0.37	49.00 (13.54)	t=0.30	53.86 (17.10)	t=-0.05	
University or higher	352	57.0	4.12 (0.85)	p=0.710	48.66 (13.84)	p=0.765	53.93 (16.19)	p=0.959	
			,	Work status					
Working	235	38.0	4.03 (0.84)	t=-2.15	47.62 (13.48)	t=-1.76	53.00 (17.04)	t=-0.97	
Not-working	383	62.0	4.18 (0.85)	p=0.031	49.60 (13.66)	p=0.079	54.33 (16.41)	p=0.332	
Perceived income									
Poor <sup>a</sup>	143	23.1	4.04 (0.93)		46.28 (14.14)	F=310.53	53.54 (12.31)	F=4.36	
Moderate <sup>b</sup>	442	71.5	4.17 (0.82)	F=2.79 p=0.062	49.33 (13.42)	p=0.0001 Differences	56.64 (18.42)	p=0.013 Differences	
Good <sup>c</sup>	33	5.3	3.86 (0.80)	p 0.002	53.54 (12.31)	c>a	53.36 (16.06)	b>a	

OK-RAS: Ok-Religious Attitude Scale, WEMWBS: Warwick-Edinburgh Mental Well-Being Scale, PETLDS: Post-Earthquake Trauma Level Determination Scale, SD = Standard deviation; t = independent samples t-test; F=One-way analysis of variance; Difference between group=Tukey Test; p=Significance level. Bold values: p < 0.05 is a statistically significant value

According to age groups, the mean scores of religious attitude and spiritual well-being for the 26-34 age group and those over 35 years of age were significantly higher than those for the 18-25 age group (p=0.0001). The average scores of religious attitudes among working individuals were significantly higher than those of non-working individuals (p=0.031). The mean scores of spiritual well-being (p=0.0001) and post-earthquake trauma levels (p=0.013) for individuals with good perceived income were significantly higher than for those with poor income (Table 1).

The mean score of the religious attitude level of the earthquake survivors  $(4.12\pm0.85)$  was high, and they were very religious. The sub-dimensions of the Ok-Religious Attitude Scale revealed that the mean scores were at a very high level in the cognition dimension  $(4.81\pm0.63)$ , while they were at a high level in the dimensions of emotion  $(3.75\pm1.22)$ , behavior  $(3.77\pm1.14)$ , and relationship with God  $(4.15\pm1.07)$ . The scores on the Mental Well-Being Scale ranged between 14 and 70, with a mean score of 48.85 (Table 2). This indicated a "good" level of mental well-being. The scores obtained from the scale to determine the level of post-earthquake trauma ranged between 22 and 94, while the mean score was 53.83. Accordingly, the trauma level of the earthquake survivors was below the medium level (Table 2).

Table 2. Descriptive findings related to the scores obtained from the scales (n:618)

Scales	Min-max	Mean	Standard deviation	Level
The Ok-Religious attitude scale	1-5	4.12	0.85	High (Highly religious)
Cognition sub-dimension	1-5	4.81	0.63	Very high (Very religious)
Emotion sub-dimension	1-5	3.75	1.22	High (Highly religious)
Behavior sub-dimension	1-5	3.77	1.14	High (Highly religious)
God sub-dimension	1-5	4.15	1.07	High (Highly religious)
The Warwick-Edinburgh Mental Well-being Scale	14-70	48.85	13.61	Good
Post-Earthquake Trauma Level Determination Scale	22-94	53.83	16.65	Below medium

The relationship between the mean scores of women's religious attitudes, mental well-being, and post-earthquake trauma level revealed a moderately significant positive correlation between women's religious attitudes and mental well-being levels (r=0.57, p=0.000) and a very weak significant positive correlation between religious attitudes and trauma levels (r=0.20, p=0.0001) p=0.000). The correlation between trauma levels and mental well-being levels was statistically insignificant (r=0.03, p=0.394) (Table 3).

**Table 3.** Relationship between religious attitude, mental well-being, and post-earthquake trauma level of women (n=618)

	Scales	Ok-Religious Attitude	Mental Well-Being	Trauma Level	
Ok-l	Religious Attitude	1	r=0.57* p=0.0001	r=0.20* p=0.0001	
M	ental well-being	r=0.57* p=0.0001	1	r=0.03* p=0.39	
Trauma level		r=0.20* p=0.0001	r=0.03* p=0.39	1	

<sup>\*</sup>Pearson Correlation Coefficients

Table 4 shows the effect of Religious Attitude on the Mental Well-Being and Trauma Level Scales. Mental well-being and trauma levels are significant predictors of religious attitudes. The rate of mental well-being and trauma levels together explaining the total variance in religious attitude was 60% (F=173.42, p=0.0001) (Table 4).

Table 4. Linear regression analysis on the prediction of mental well-being and postearthquake trauma level scale by religious attitude scale

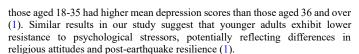
Variables	В	Std. Error	Beta	t	p
Constant	0.84	1.06	-	14.23	0.0001
Mental Well-Being	0.28	0.01	0.56	17.56	0.0001
Trauma level	0.07	0.01	0.18	5.58	0.0001

R=0.601, R2=0.361, F=173.425, p<0.01

Dependent variable: Religious Attitude, level of significance: 0.05

## Discussion

The average scores for religious attitudes and mental well-being in individuals aged 26 and over were significantly higher than those in the 18-25 age group. The study by Akyüz and Kulaoğlu (2021) in individuals aged 18-65 found that those aged 41-65 had more spiritual orientation (27). Çınar (2022) concluded that the level of psychological resilience increases with increasing age (28). Cengiz and Peker's (2023) study conducted on adult earthquake survivors revealed that



Working participants' mean religious attitude scores were significantly higher than those of non-working participants. This is expected, as people tend to turn to religion in extraordinary situations like disasters, seeking religious knowledge to make sense of their experiences (29). Kaplan et al. (2020) observed that during the coronavirus pandemic, individuals focused more on spiritual values and the reality of death, leading to changes in life priorities and increased religious practices (12). The damage to workplaces and feelings of hopelessness and helplessness may have led working participants to rely more on religious coping strategies compared to non-working individuals.

In our study, the mean scores of mental well-being levels with good perceived income status were higher than those with poor income status. Similarly, Çnar (2022) found that the psychological resilience levels of individuals with good income status were higher than those with low income (28). Furthermore, Wang et al. (2020) found that the subjective well-being levels of individuals with higher incomes were higher than those with lower incomes (30). These results highlight the significant role of economic stability in mental health and resilience (28,30).

The female earthquake survivors in our study had high levels of religious attitudes. Kaplan et al. (2020) found that most participants in a COVID-19 study demonstrated high levels of religiosity and sought religious and spiritual support during crises (12). Research suggests that religious beliefs and practices provide comfort and support during disasters, facilitating healing processes (31). In Iran, a study revealed that 68.9% of participants exhibited religious attitudes toward earthquake crisis management, highlighting the significant role of these beliefs in enhancing access to healthcare services. These beliefs helped individuals make sense of crises and cope more effectively (32).

The women in this study scored highest in the cognition subdimension of religious attitudes and exhibited high levels of emotion, behavior, and God relationship scores. Bozkurt (2023) observed that some earthquake survivors attributed disasters to divine punishment or as tests from God, often connecting religious concepts with the disaster (11). Similarly, Kaplan et al. (2020) found that disasters are often interpreted as divine tests, prompting prayer, worship, and almsgiving to cope with fear and anxiety (12). In Muslim Turkish society, approaches such as seeking God's mercy, being patient, and maintaining a positive attitude are common (33,34).

The mental well-being of women in our study was at a good level. However, Bozkurt's (2023) qualitative study conducted three weeks post-earthquake found that most survivors reported significant psychological difficulties, including stress, fear, and depression (11). Similarly, Kirman (2023) noted that survivors experienced guilt, grief, and a sense of emptiness due to loss and migration (35). The discrepancy may indicate a recovery over time, as our study was conducted three to four months after the earthquake (35). Other studies have reported that 82% of earthquake survivors frequently thought about death after the earthquake (36), and 40.5% experienced anxiety (37). Since the results of our study were obtained between the third and fourth months after the earthquake, individuals may have started to recover by this time.

This study found a significant positive relationship between religious attitudes and mental well-being. Other studies have reported a positive relationship between spiritual experience and religious attitude with psychological resilience (28), coping with stress (38,39), dealing with mental and physical disorders (40), and psychological well-being (41). Religious practices, both individual and collective, during times of loss and grief-such as those caused by disasters-help people come together, share their pain, and support one another. In Muslim Turkish society, collective prayers at funeral ceremonies support individuals and reduce feelings of loneliness, which may help in coping with emotional difficulties.

A very weak but significant positive relationship was found between religious attitudes and levels of trauma. Religious beliefs can offer comfort and strength during overwhelming situations while providing a framework to make sense of catastrophic events (37,41). However, disaster trauma may also challenge these beliefs, creating a complex dynamic that warrants further investigation (42).

Lastly, mental well-being and trauma levels were significant predictors of religious attitudes. Evidence shows that religious coping strategies provide individuals with solace, purpose, and community support during distress, mitigating disasters' emotional consequences (5).

Our study results can be generalized to other provinces but not the entire nation. Variables such as mental well-being and religious attitudes may depend on the culture, religion, and geography. The data are generally collected from a specific group and collected online.

# Conclusion

The female earthquake survivors in our study had high levels of religious attitudes, favorable levels of mental well-being, and below medium levels of post-earthquake trauma. There was a significant positive relationship between women's religious attitudes and their mental well-being and trauma levels.

Furthermore, mental well-being and trauma levels were essential predictors of religious attitudes. Assessing coping methods, religious beliefs, mental health, and trauma levels of individuals during both the acute and later stages following an earthquake is essential for planning and executing interventions for those affected. Conducting intervention studies to promote the mental well-being of individuals affected by the earthquake, reduce the impact of trauma, and share the results will contribute to the knowledge in the field. Furthermore, it is essential to conduct qualitative studies to meticulously investigate the individuals' experience, their coping mechanisms, and the effects of the trauma. Future research could include different groups, such as men, children, and adolescents, and consider variables such as psychological resilience, problemsolving skills, and social and official support resources.

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## **Ethical statement**

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of University X (May 18, 2023/No 93302). The participants were informed about the purpose of the study, the method, and the time required, that participation would not cause harm, and that it was voluntary. We obtained electronic informed consent from all participants.

# **Conflicts of interest**

No competing financial interests exist.

## **Author contributions**

Conceptualization and methodology: Şükran Başgöl, Semra Elmas, Saliha Yurtçiçek Eren; Data collection: Saliha Yurtçiçek Eren; Data analysis: Şükran Başgöl, Semra Elmas, Saliha Yurtçiçek Eren; Critical review: Şükran Başgöl, Semra Elmas, Saliha Yurtçiçek Eren; Writing the original draft: Şükran Başgöl, Semra Elmas, Saliha Yurtçiçek Eren; Supervision: Şükran Başgöl; Final approval: Şükran Başgöl, Semra Elmas, Saliha Yurtçiçek Eren.

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