



Research Article

Unveiling the Healing Power of Spirituality: Exploring the Impact on Post-Earthquake Trauma among Türkiye Survivors

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Abstract

The trauma experienced after the earthquake affects the well-being of the survivors and makes it difficult for them to adapt to daily life. The level of individuals being affected by trauma may vary depending on many factors such as demographic variables and spiritual well-being. The aim of this study is to examine the relationship between post-earthquake trauma and spiritual well-being and various sociodemographic variables among survivors of the 6 February 2023 earthquake in Türkiye. In this study, the question of whether survivors' post-earthquake trauma levels are significantly explained by their spiritual well-being was sought to be answered. Relational survey model of quantitative research method was used in the study. The sample of the study consists of 440 participants who were reached by convenience sampling technique from earthquake survivors in 11 provinces in Türkiye who survived the earthquake centred in Kahramanmaraş Province. The Scale for Determining the Level of Post-Earthquake Trauma, Spiritual Well-Being Scale, and Sociodemographic Information Form were used as data collection tools in the study. The data obtained were analysed using one-way analysis of variance, t-test and simple regression analysis. As a result of the study, it was determined that there was a low level, negative and significant relationship between the participants' post-earthquake trauma levels and their spiritual well-being. While there was no significant difference in terms of post-earthquake trauma level between the groups with different residence, education level, and frequency of religious beliefs, a significant difference was found between the post-earthquake trauma level and variables such as gender, age, loss of relatives in the earthquake, perceived economic status, and damage status of the house. The findings show that there is a partial effect of spiritual well-being factor in reducing the negative effects of post-earthquake trauma and the importance of spiritual support in mental health interventions.

Keywords:

Earthquake • Post-earthquake trauma • Spiritual well-being • Post-traumatic stress disorder

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Introduction

Natural disasters have affected people in every period of history and caused great destruction (Adeagbo et al., 2016; Lazzaroni & van Bergeijk, 2014). Among natural disasters, earthquakes are among the major disasters that can cause loss of life and property. In addition to destructive physical damages, earthquakes can also have long-lasting psychosocial effects. Individuals exposed to earthquakes may encounter various psychological and social problems after the earthquake due to their traumatic experiences (Beaglehole et al., 2019). Factors such as loss of life and property, injury, homelessness, inability to access food and services, fear, and loss of control in earthquakes have serious psychological effects on individuals and cause post-traumatic stress disorder, anxiety, depression, anxiety disorder, anger, sleep problems, and many other symptoms (Bertinelli et al., 2023; Lu et al., 2023; Norris et al., 2002; Sezgin & Punamäki, 2012).

On 6 February 2023, two devastating earthquakes of magnitude 7.7 and 7.6 struck Kahramanmaraş and 11 surrounding provinces in southern Türkiye, causing significant human and material losses (WHO, 2023). These earthquakes, which affected 16.4 per cent of the Turkish population, killed over 50,000 people and injured over 100,000 due to damage and collapse of buildings (Disaster and Emergency Management Presidency, 2023; Strategy and Budget Directorate, 2023; Yılmaz, 2023). People in the region were physically and psychologically exhausted due to traumatic events such as the loss of their relatives, abandonment of their damaged homes, and the collapse of social structures, and experienced prolonged fear and helplessness due to the continuation of aftershocks (WHO, 2023). However, despite these traumatic experiences, some people can overcome this challenging period better thanks to their psychological resilience and spiritual well-being (Hardiman & Simmonds, 2013; Park, 2004; Park & Gutierrez, 2013). Therefore, the main purpose of this article is to examine the effect of spiritual well-being on the post-earthquake trauma levels of the survivors of the 6 February 2023 Kahramanmaraş Earthquake.

Post-Earthquake Traumatic Stress

Earthquakes are natural disasters that can cause long-term physical and psychological damage to exposed individuals (WHO, 2021). One of the common psychological consequences of earthquake experience is post-traumatic stress disorder (PTSD). PTSD is a complex psychiatric disorder characterised by intrusive re-experiencing of the traumatic event, avoidance of trauma-related stimuli, negative changes in mood and cognition, increased arousal and reactivity. Many studies have revealed the high prevalence of PTSD symptoms among earthquake survivors and emphasised the need for effective interventions to address post-earthquake trauma (Divsalar & Dehesh, 2020; Liang et al., 2019; Wang et al., 2015).

PTSD is a condition that can occur after experiencing severe traumatic events. These events include interpersonal violence, war, life-threatening accidents, or natural disasters. Symptoms of PTSD include disturbing and intrusive memories and nightmares of the trauma, irritability, hypervigilance (hypersensitivity to threats or constant thoughts of danger), sleep problems, emotional withdrawal, and difficulty focusing. Individuals with PTSD generally tend to avoid places, activities or objects that may remind them of the trauma (Yehuda et al., 2015). In post-disaster settings, many risk factors have been identified for the development of psychopathologies such as posttraumatic stress disorder (PTSD), depression, and anxiety disorder (Norris et al., 2002). These factors are categorised as risk factors that occur pre-event (such as personal or family history of mental health disorders and history of exposure to traumatic events and life stressors), during the event (such as loss of family members or close friends, communication difficulties, degree of injury and witnessing dead bodies) and post-event (such as loss of financial and social support resources). However, there is considerable heterogeneity between individual responses to the same event, and while some people may adapt well even after extreme experiences, certain population groups, such as people who have experienced pre-disaster difficulties, may be more vulnerable to post-disaster mental health problems (Cerdá et al., 2013; Galea et al., 2005).

In societies exposed to natural disasters such as earthquakes, the rates of post-traumatic stress disorder may be high (Galea et al., 2005). In a meta-analysis of studies on post-earthquake survivors, it was reported that the incidence of PTSD after earthquakes was 23.66% (Dai et al., 2016). In a study conducted on adults in Nepal, the prevalence of PTSD was found to be 24.10% (Adhikari Baral & K.C, 2019). In addition to demographic characteristics such as age, gender and educational status, factors such as the severity of earthquakes, the prevalence of loss of life and property, and how the victims were exposed to the disaster affect the level of trauma (Karamustafalıoğlu et al., 2023). Earthquakes can cover more than one problem area different from other traumatic life events due to reasons such as sudden occurrence of earthquakes that affect daily life routines, having a destructive effect, causing death and injuries. In addition, aftershocks that continue after earthquakes can have chronic effects on the psychology of the person (Tanhan & Kayri, 2013).

Life events with many difficulties such as earthquakes can negatively affect the psychosocial and physical quality of life of individuals (Karanci & Rüstemli, 1995; Kılıç & Ulusoy, 2003; Niitsu et al., 2014). Especially in individuals exposed to earthquake, the risk of conditions such as PTSD, depression, anxiety disorders, acute stress disorder and burnout increases (Cénat et al., 2020; Jin et al., 2018; Xu & Wei, 2013). In addition to psychological effects, physical health problems may also occur after an earthquake. Injuries that occur during or after the earthquake can negatively

affect the physical health of individuals (Gunn, 1995; Teramoto et al., 2015). Due to the stress and difficulties experienced, sleep patterns of individuals exposed to earthquakes are disrupted, eating habits change, and physical activity decreases (Chen et al., 2021; Labra et al., 2017; Tempesta et al., 2013). When these factors come together, general health status and physical quality of life in individuals are negatively affected. Therefore, it is important to provide psychological and physical support services to individuals after an earthquake (Sumer et al., 2005). In addition, the use of support resources such as spirituality facilitates the coping process of individuals.

Spiritual Well-Being and Mental Health

Spirituality is a multidimensional structure that encompasses the individual's search for meaning, purpose and connection with a power greater than oneself (Dyson et al., 1997; Grouden & Jose, 2015; Pargament, 2013). The concept of spiritual well-being is defined as a positive perception reflected upon oneself from a qualified interaction with the transcendent power, others, nature and the self (Tan & Yıldız, 2022). Spiritual well-being, which is an important component of psychological and social well-being, which is one of the main determinants of health, is generally associated with positive mental health outcomes (Chirico, 2016; Lee, 2017; Rahmat et al., 2022; Unterrainer et al., 2014). It includes elements such as religious beliefs, faith, sense of transcendence, personal values, interpersonal relationships, and connection with a higher power or a broader sense of purpose (Pargament, 1992; Park, 2013; Steger et al., 2010). Research shows that spiritual well-being can play a protective role in promoting resilience, coping and psychological adaptation in the face of extraordinary situations and difficulties in life, including traumatic events (Chen & Koenig, 2006; Ekşi et al., 2020; Momeni et al., 2013).

In recent years, there has been an increase in studies examining the relationship between spiritual well-being and mental health. These studies show that individuals with high levels of spiritual well-being are less likely to exhibit psychological distress, anxiety and depression (Abu-Raiya et al., 2015; Fradelos et al., 2019; Koenig, 2012; Taheri-Kharamah, 2016; Volcan et al., 2003). They also tend to have higher levels of hope, optimism, and subjective well-being (Conversano et al., 2010; Gallagher & Lopez, 2009; Moore, 2005; Schrank et al., 2008). Coping mechanisms associated with spiritual well-being, such as seeking social support from religious or spiritual communities, finding solace in prayer or meditation, and deriving a sense of meaning and purpose from one's beliefs, may contribute to psychological resilience and facilitate posttraumatic recovery (Edwards et al., 2020; Feder et al., 2013). In this context, spiritual well-being is defined as a state of "well-being" resulting from the underlying mental health status and it is emphasised that it is an indicator of the quality of life of the individual in the spiritual dimension (Fisher, 1998).

The relationship between spiritual well-being and trauma is based on the potential of spiritual beliefs and values to support as a protective factor against the negative psychological effects of traumatic events (Park, 2013). The presence of a strong spiritual foundation can increase the individual's ability to make sense of the traumatic experience, to find meaning in suffering, and to promote a sense of hope and transcendence beyond immediate distress (Deal, 2011). Furthermore, spiritual well-being can facilitate the process of posttraumatic growth by contributing to the reconstruction of a coherent life narrative after trauma (de Castella & Simmonds, 2013).

Previous studies examining the role of spirituality in disaster settings have reported positive relationships between spiritual well-being and posttraumatic outcomes, such as reduced PTSD symptoms, improved psychological functioning, and greater resilience (Blanc et al., 2016; Kula, 2002; Park, 2017). However, there is limited research focusing on the effect of spiritual well-being on post-earthquake trauma levels, especially in the context of the 6 February Kahramanmaraş Earthquake. Therefore, this study aims to fill this gap by investigating the effect of spiritual well-being on the post-earthquake trauma levels of survivors by this particular earthquake. Given the unique cultural and religious context of Kahramanmaraş and its surroundings, it is particularly important to investigate the role of spiritual well-being after the 6 February Kahramanmaraş Earthquake. Religious and spiritual beliefs are deeply rooted in the lives of many individuals in this region and can serve as powerful sources of solace, meaning and support in times of distress (Okumuş, 2008).

In the light of the explanations mentioned above, the aim of this study is to examine the role of spiritual well-being and sociodemographic variables in explaining the post-earthquake trauma levels of survivors by the 6 February Türkiye Earthquake. In line with the aim of the research, the following questions were sought to be answered:

1. What is the level of post-earthquake trauma and spiritual well-being of earthquake survivors?
2. Is there a significant difference between the post-earthquake trauma levels of earthquake survivors and various sociodemographic variables (gender, age, economic status, place of residence, damage status of the dwelling, loss of relatives, frequency of religious belief practice)?
3. Are the spiritual well-being levels of earthquake survivors a significant predictor of post-earthquake trauma symptoms?

Method

In this research, relational survey model was used based on quantitative approach. In this study, it was tried to determine the relationships between post-earthquake

traumatic stress levels, spiritual well-being and sociodemographic characteristics of earthquake survivors.

Participants and procedure

This is a cross-sectional study. A total of 440 earthquake survivors (335 women and 105 men) aged between 18 and 60 (mean age: 25.12 ± 8.48 years) participated in this study. Although 448 participants were initially recruited, only 440 successfully completed the study. Convenience sampling method were used to avoid loss of time, money and effort. Inclusion criteria included having experienced the 6 February earthquake, falling within the age range of 18- 60, and literacy. Detailed participant information can be found in Table 1.

Table 1.
Sociodemographic characteristics of the participants

Variables	N	%
Gender		
Female	335	76.1
Male	105	23.9
Age group		
18-25	322	73.2
26-34	63	14.3
35-60	55	12.5
Level of education		
Primary/Secondary School	13	3.0
High School	186	42.3
Associate Degree	111	25.2
Licence	130	29.5
Perceived family income level		
Lower	97	22.0
Medium	321	73.0
Higher	22	5.0
Settlement		
Metropolitan	150	34.1
City centre	115	26.1
District centre	106	24.1
Town/Village	69	15.7
Frequency of religious beliefs, if any		
None	20	4.5
Rarely	24	5.5
Occasionally	135	30.7
Regular	238	54.1
Frequently	23	5.2
Death of relatives due to the earthquake		
Yes	312	70.9
No	128	29.1
Damage status of the dwelling after the earthquake		
No damage at all	86	19.5
Slightly damaged	212	48.2
Moderately Damaged	61	13.9
Heavily damaged	60	13.6
Completely demolished	21	4.8
Total	440	100

In this study, in which the relational survey model was used, data were collected using a cross-sectional approach. The data collection process targeted survivors living in the earthquake zone or who temporarily migrated to other cities due to the damage to their houses. Two months after the earthquake, the researchers reached out to psychosocial support professionals who were assisting earthquake survivors and university students residing in the affected zone, sharing the link to the research. Data were obtained online from earthquake survivors who voluntarily agreed to participate in this study.

Measures

Sociodemographic Information Form

It is a form prepared by the researchers and includes questions about the age group, gender, perceived income level, education level, place of residence, frequency of religious belief, death of relatives due to the earthquake, and the damage status of the house after the earthquake.

Scale for Determining the Level of Post-Earthquake Trauma

The scale was developed by Tanhan and Kayri (2013) and is a measurement tool that assesses the level of traumatic stress experienced by earthquake survivors after the earthquake. The scale is designed as a 5-point Likert scale, and the highest score that can be obtained from the scale is 100 and the lowest score is 20. A decrease in scores indicates a decrease in the level of post-earthquake trauma. The scale has five sub-dimensions. These dimensions were named as Behavioural Problems, Emotional Limitation, Affective, Cognitive Structure and Sleep Problems. Each dimension reflects the trauma behaviours contained in specific items in the scale. The scale factors accounted for 54.29% of the total variance, with varying loading values across sub-dimensions. These loadings ranged from 0.516 to 0.691 in the first sub-dimension, 0.429 to 0.812 in the second, 0.454 to 0.679 in the third, 0.476 to 0.689 in the fourth, and 0.493 to 0.813 in the fifth. Correlations among scale items ranged from 0.355 to 0.596. The scale demonstrated high internal reliability, with a Cronbach's alpha coefficient of .92, indicating strong consistency across items.

Spiritual Well-Being Scale

The scale was developed by Ekşi and Kardaş (2017) and is used to evaluate the process of understanding and living life within the framework of values and ultimate meanings. This scale consists of three sub-dimensions (transcendence, harmony with nature and anomie) covering personal, social, environmental and transcendental aspects of life and includes 29 items in total. The scale is used by making a five-point Likert-type evaluation. The highest score that can be obtained from the scale is 145,

and the lowest score is 29. In the research conducted to evaluate the validity of the scale, the fit indices of the model were determined as ($\chi^2/sd = 4.11$, RMSEA = .06, SRMR = .50, NFI = .90, CFI = .92). These results show that the scale is appropriate in terms of validity. The internal consistency coefficient (Cronbach's alpha value) of the scale was calculated as .88. In addition, when the sub-dimensions were analysed, it was found that the transcendence dimension had a reliability level of .95, harmony with nature .86, and anomie .85. In this study, the internal consistency coefficient of the scale was calculated as .89.

Data Analysis

Prior to analysis, the collected data were screened to identify both univariate and multivariate outliers. Parametric analyses were used in the statistical procedures, as all scales had skewness and kurtosis values between +1.5 and -1.5 as recommended by Tabachnick and Fidell (2013). In line with the purpose of the study, one-way analysis of variance and t-tests were used to determine how participants' post-earthquake trauma levels differed in terms of different socio-demographic variables. In cases where the frequency of some data was low, non-parametric tests were also used (Karagöz, 2010). In the continuation of the study, simple regression analysis was used to predict the participants' post-earthquake trauma levels and determine the relationship with their spiritual well-being. The SPSS 23.0 Statistics Package Program was used to analyse the data.

Results

In this section, in line with the aim of the research, it was revealed whether the participants' post-earthquake trauma levels were significantly explained by their spiritual well-being and other variables. The analysis of the findings is presented in the tables below.

Table 2.

Descriptive values of the scale for determining the level of post-earthquake trauma and spiritual well-being scale

	Min.	Max.	M	α	SK	KU
Post-Earthquake Trauma	1.05	4.95	3.29	.04	-.285	.588
Behavioural Problems	1.00	5.00	2.72	.04	.206	-.601
Excitement Limitation	1.00	5.00	3.02	.05	.065	-1.021
Affective	1.00	5.00	3.42	.04	-.260	-.170
Cognitive Configuration	1.00	5.00	3.76	.04	-.684	-.282
Sleep Problems	1.00	5.00	3.52	.05	-.464	-.711
Spiritual Well-Being	2.14	4.97	4.05	.02	-.575	-.149

When Table 2 is examined, it is seen that the mean score of the participants' post-earthquake trauma level is 3.29 ± 0.04 and the mean score of spiritual well-

being level is 4.05 ± 0.02 . The mean of behavioural problems sub-dimension of the participants' post-earthquake trauma levels was 2.72 ± 1.01 , the mean of excitability sub-dimension was 3.02 ± 1.13 , the mean of affective sub-dimension was 3.42 ± 0.84 ; the mean of cognitive configuration sub-dimension was 3.76 ± 0.98 , and the mean of sleep problems sub-dimension was 3.52 ± 1.14 .

Table 3.
Examination of post-earthquake trauma level in terms of gender and loss of relatives in the earthquake

Variables		n	M	ss	sd	t	p
Gender	Female	335	3.39	0.83	438	4.519	.000*
	Male	105	2.97	0.81			
Death of a relative in the earthquake	Yes	312	3.39	0.81	438	3.678	.000*
	No	128	3.06	0.88			

* $p < 0.05$

According to the t-test conducted to analyse the relationship between post-earthquake trauma and gender and the status of having lost a relative in the earthquake in Table 3, there is a significant difference between the level of post-earthquake trauma and both variables. According to the averages in the table, women and those who lost a relative in the earthquake have higher levels of post-earthquake trauma.

Table 4.
Examination of post-earthquake trauma level in terms of age group and place of residence

Variables		n	M	α	F	p	Binary Difference
Age Group	18-25	322	3.36	.82	6.584	.002*	3<1
	26-34	63	3.27	.78			
	35-60	55	2.92	.96			
Place of Settlement	Metropolitan	150	3.34	.81	0.876	.454	-
	City Centre	115	3.24	.89			
	District Centre	106	3.36	.82			
	Town/Village	69	3.29	.84			

* $p < 0.05$

According to the one-way ANOVA test conducted to analyse the level of post-earthquake trauma in terms of age group and place of residence, there is no significant difference between the type of place of residence and the level of post-earthquake trauma, while there is a significant difference between the age group and the level of post-earthquake trauma. As the earthquake survivors' age increases, their post-earthquake trauma levels decrease.

Table 5.

Examination of post-earthquake trauma level in terms of educational status, perceived economic status, damage status of the house, frequency of living religious beliefs

Variables		n	Rank Mean	Sd	X ²	p	Binary Dif.
Education Level	Primary/Secondary School	13	193.69				
	High School	186	228.58				
	Associate Degree	111	235.41	2	6.611	.085	-
	Bachelor's Degree	130	198.89				
Perceived Economic Status	Lower	97	259.30				
	Medium	321	210.82	2	12.105	.002*	2<1
	Higher	22	190.68				
Damage to the house	No damage at all	86	176.10				
	Slightly damaged	212	224.92				
	Moderately damaged	61	242.57	4	16.471	.002*	1<2,3,5
	Heavily damaged	60	227.36				
	Completely demolished	21	273.95				
Frequency of religious beliefs, if any	None	20	232.90				
	Rarely	24	264.23				
	Occasionally	135	228.02	4	7.703	.103	-
	Regularised	238	207.45				
	Very Frequently	23	255.00				

*p<0.05

According to the Kruskal Wallis H Test for the relationship between post-earthquake trauma level and education and perceived economic status in Table 5, no significant difference was found between the participants' education level and post-earthquake trauma levels. There is a significant difference between the perceived economic status of the participants and their post-earthquake trauma levels. According to the results of Mann Whitney U Test conducted between the groups in order to determine the source of the difference, participants with a low income level have higher post-earthquake trauma levels than those with a medium income level. According to the Kruskal Wallis H Test conducted to determine the relationship between the level of post-earthquake trauma, the damage status of the house and the frequency of experiencing religious beliefs; there is no significant difference between the frequency of experiencing religious beliefs and the level of post-earthquake trauma, while there is a statistically significant difference between the damage status of the house and the level of post-earthquake trauma. According to the Mann Whitney U Test conducted between the groups in order to determine between which variables the difference is, the post-earthquake trauma levels of those whose houses were not damaged at all after the earthquake are lower than those whose houses were damaged and completely destroyed.

The correlation between the variables of the study was examined before the simple linear regression analysis performed to test the explanatory power of spiritual well-being on the level of post-earthquake trauma. In this direction, the correlation between the variables is shown in Table 6.

Table 6.
Correlation coefficient between variables

	1	2
1. Post-Earthquake Trauma	1	-.217**
2. Spiritual Well-Being		1

**p<0.01

According to Table 6, there is a negative and low level significant correlation ($r = -0,21$ $p < ,01$) between spiritual well-being and post-earthquake trauma level. According to these findings, as the earthquake survivors' spiritual well-being increases, their post-earthquake trauma levels decrease.

Table 7.
Spiritual well-being as a predictor of post-earthquake trauma

Factor	B	SE	β	t	p	95% CI	F	R ²	(AjR ²)
Constant	4.824	.330		14.608	.000	4.17-5.47	21.64***	.047	.045
SWB	-.376	.081	-.217	-4.652	.000	-0.53 to -0.21			

***p<0.01

In the initial multiple linear regression analysis for PET, it is seen that there is a low level, negative and significant relationship between participants' spiritual well-being and post-earthquake trauma levels, and that spiritual well-being scores explain 4.5% of the variance observed in post-earthquake trauma level scores ($R = .217$ $R^2 = .047$ $F(1-438) = 21.64$ $p < .001$) (see Table 7).

Discussion

This study was conducted to examine the effect of spiritual well-being and various sociodemographic variables on the post-earthquake trauma levels of survivors by the 6 February Türkiye Earthquake. The study found that the post-earthquake trauma (65.8%) of those exposed to the earthquake was at a moderate level and their mental well-being (81%) was at a high level. The fact that the mean of the cognitive configuration sub-dimension of the post-earthquake trauma level (3,76) was higher than the other sub-dimensions shows that the participants continue to worry that an earthquake will occur at any moment and that earthquake images continue to exist in their minds. In a recent study conducted by Koçoğlu et al. (2023) on university students, the levels of post-earthquake trauma and cognitive structuring sub-dimension of survivors coincide with the findings of this study. Similarly, in a study conducted in the USA on 130 Californian earthquake survivors who were interviewed three months after the earthquake, it was reported that only 13% of the participants met the full PTSD criteria and 48% met the re-experiencing and hyperarousal criteria of PTSD (McMillen et al., 2000). In a study conducted in Türkiye after the Marmara Earthquake, the prevalence of posttraumatic stress disorder was found to be 43%, and the prevalence of major depression was found to be 31% (Başoğlu et al., 2002). In a study conducted in 2008 on those exposed to the

8.0 magnitude earthquake near Chengdu, the capital of Sichuan province of China, the prevalence of post-traumatic stress disorder was found to be 45% in heavily damaged areas. It was emphasised that symptoms such as recurrent thoughts and sleep disorders were very common in individuals who survived the earthquake (Kun et al., 2009). In a meta-analysis study examining 46 studies on survivors after earthquakes, it was emphasised that the prevalence of post-traumatic stress disorder was 23.66% (Dai et al., 2016). Since the research was conducted in the two month of the earthquake, the high cognitive structure sub-dimension scores of the participant earthquake survivors were an important finding in terms of showing that the effects of traumatic experiences were still continuing and the healing process would take time. Following a traumatic event such as an earthquake, individuals' perception of danger and anxiety increase. Concerns about the possibility of recurrence of the earthquake due to the continuation of aftershocks create a constant sense of threat and cause the images related to the earthquake to be constantly revived in the minds of individuals and the fear to continue.

In this study, it was observed that there was a negative and significant relationship between the post-earthquake trauma levels of the participants and their spiritual well-being, albeit at a low level. Individuals with high spiritual well-being have lower levels of post-earthquake traumatic stress. In a study conducted on survivors after the 2010 Haiti Earthquake, in which more than 220 thousand people died, it was found that spirituality and positive religious coping reduced post-traumatic stress symptoms (Mesidor & Sly, 2019). Similarly, there are findings that religious and spiritual coping reduces posttraumatic stress in individuals exposed to various natural disasters (Aten et al., 2019; Ferguson, 2023; Sun et al., 2019). In some studies, it is pointed out that negative religious coping (perceiving the earthquake as God's punishment as a result of their own sins and lack of spirituality) increases posttraumatic stress symptoms (Feder et al., 2013). In a study conducted with individuals affected by natural disasters, it was found that spiritual support had a significant negative relationship with posttraumatic stress symptoms (Ai et al., 2023). In a study conducted after a natural disaster in Indonesia, it was determined that spirituality contributed 10.7% to posttraumatic development (Subandi et al., 2014). In a study conducted by Sezgin and Punamäki (2012) on earthquake survivors in the Southeastern Anatolia region of Türkiye, approximately half of the women explained the trauma as God's will and guidance, 41% as a natural event, and 9% as human irresponsibility. Spiritual well-being, which is related to the ability to find meaning and purpose in life, can facilitate the individual who encounters a natural disaster such as an earthquake to make sense of the unexpected traumatic experience and reduce the level of post-traumatic stress. Individuals with high levels of spiritual well-being may have more internal resources such as hope, gratitude and commitment that are effective in coping with difficulties. In the post-traumatic process, spiritual values can enable individuals to evaluate events from a broader perspective and create new meanings.

In this study, women who experienced the earthquake and individuals who lost their relatives had higher levels of post-earthquake trauma. Similarly, in the studies conducted after the Marmara Earthquake, traumatic stress levels of women exposed to the earthquake and individuals who lost their relatives were found to be higher (Başoğlu et al., 2002; Livanou et al., 2002; Salcioglu et al., 2007). There are many studies indicating that women exposed to earthquake have higher traumatic stress levels than men (Adhikari Baral & K.C, 2019; Cofini et al., 2015; Dell’Osso et al., 2013; Tang et al., 2017; Zhou et al., 2013). The fact that daily routine tasks such as cooking, cleaning, and care are mostly performed by women in temporary living spaces after the earthquake increases women’s stress levels (Yoosefi Lebni et al., 2020). In addition, studies emphasise that those who lost their relatives in the earthquake have higher levels of post-traumatic stress (Fan et al., 2015; Feder et al., 2013; Liu et al., 2019). The death of a family member, especially the loss of a child, increases the posttraumatic stress levels of surviving adults (Chan et al., 2011). The loss of a close person causes a deep mourning process and seriously affects the emotional, social and psychological balance of the individual. Breaking the ties with the deceased person and changes in future expectations may lead to an increase in the level of trauma. In addition, individuals have to cope with the guilt, emotional pain, feeling of emptiness, longing and grief caused by the loss of their loved ones, and this emotional intensity increases the level of trauma.

In this study, it was determined that the trauma levels of earthquake survivors decreased as their age increased. Similarly, in a study conducted on Taiwanese earthquake survivors, the traumatic stress levels of earthquake survivors between the ages of 25-44 were found to be higher than those of the group over the age of 60 (Kuo et al., 2007). In a study conducted in Italy, it was reported that younger earthquake survivors had higher levels of traumatic stress (Dell’Osso et al., 2013). After the earthquake, young people whose education and participation in employment are disrupted have higher future anxiety (Cadichon et al., 2017). With increasing age, individuals generally have more experiences. Past life experiences may increase the likelihood of developing more psychological resilience in coping with a traumatic event. In addition, since adults who have reached a certain age maturity have relatively more self-regulation and adaptation skills, their recovery processes after trauma are faster. Since older adults have wider social support networks, they have more resource options to receive support and help after trauma. Social support is also recognised as an important factor in the posttraumatic recovery process (Dell’Osso et al., 2013).

In this study, no significant difference was found between the participants’ place of residence and education level and post-earthquake trauma levels. Similarly, in a study conducted in Italy, it was stated that the educational status of earthquake survivors did not affect the level of posttraumatic stress (Cofini et al., 2015). In a

study conducted in Nepal, a significant difference was found between the traumatic stress levels of earthquake survivors and their educational status (Adhikari Baral & K.C, 2019). In another study conducted in Nepal, it was emphasised that illiterate earthquake survivors had higher levels of traumatic stress (Acharya Pandey et al., 2023). The educational status of the participants alone may not be a determining factor on the level of post-earthquake trauma. The traumatic effects of the earthquake may be caused by more complex components such as the intensity of the individual's extraordinary experiences, social support, psychological resilience and other environmental factors.

In this study, it was observed that the trauma levels of participants with low income levels were higher. Similarly, many studies have reported that unemployed and low-income earthquake survivors are more vulnerable to trauma (Cofini et al., 2015). In a study conducted in Peru, a significant relationship was found between household income status and traumatic stress levels of earthquake survivors (Valladares-Garrido et al., 2022). People with low income levels generally live in lower quality houses. Since these houses are more vulnerable to natural disasters such as earthquakes, they are exposed to greater damage. Damage to the dwelling increases the level of trauma by increasing the risk of homelessness, safety concerns, and difficulties in meeting basic needs. In addition, individuals with low income generally have more fragile social networks and support systems.

In this study, the trauma levels of those whose houses were not damaged in the earthquake were found to be lower. Similarly, in a study conducted in China, the traumatic stress level of individuals living in places where the earthquake caused severe damage was found to be higher (Kun et al., 2009). In another study, it was stated that there was a significant difference between the level of traumatic stress and the damage and destruction of the house (Chan et al., 2011). Individuals whose houses have not damaged after the earthquake are relatively less traumatised because they feel safer and perceive that they have more control over events. Being safely evacuated from the undamaged dwelling during the earthquake may facilitate the management of the disaster experience and therefore the level of traumatic stress may be lower. In addition, individuals whose houses have not damaged are less likely to experience stress because they do not have the risk of losing important and valuable items in their homes.

In this study, no significant difference was found between the frequency of practising religious beliefs and the level of post-earthquake trauma. Similarly, in a study conducted in New Zealand, no relationship was found between having religious beliefs and the subjective well-being of earthquake survivors (Sibley & Bulbulia, 2012). In a study conducted on Van Earthquake survivors, it was found

that religiosity was not effective in reducing post-traumatic stress and it was stated that religiosity may not reduce trauma-related symptoms after disasters, but may help acceptance and thus tolerance of these symptoms (Ikizer et al., 2016). Since the religious beliefs and experiences of each individual affected by the disaster will be different, post-traumatic reactions may also vary from person to person. Religious beliefs can be a strong source of support and meaning for some people, while its effect may be less pronounced for others. Moreover, since the effects of religious beliefs on well-being are complex and multifactorial, it is not possible to determine the relationship between the frequency of religious belief practice and traumatic stress reactions determined by a single self-report question.

Conclusions

As a result of this study, which examined the role of spiritual well-being and various demographic variables in explaining the post-earthquake trauma levels of adult survivors of the earthquake that occurred on 6 February 2023 in Kahramanmaraş, Türkiye, it was found that there was a low, negative and significant relationship between the participants' spiritual well-being and post-earthquake trauma levels. It was determined that the traumatic stress levels of women, individuals who lost any relatives in the earthquake, younger adults, those with low income level, and those whose residence was damaged in the earthquake had higher levels of traumatic stress. Other sociodemographic factors such as the frequency of practising religious beliefs and educational level of the participants did not have a determining effect on the level of post-earthquake trauma. The findings of the study show that spiritual well-being may have a positive effect on reducing posttraumatic stress. Spiritual and religious values may play a role in the healing process of individuals with PTSD by providing a sense of meaning, social support, coping mechanisms, facilitating forgiveness, and personal development. However, further research is needed to better understand the specific mechanisms through which spirituality and religion exert their effects and to develop holistic psychosocial support approaches that effectively integrate these elements.

This study shows that survivors' post-earthquake trauma is at a moderate level, even though 2 months have passed since the earthquake. In this context, the psychosocial support services provided by public institutions and non-governmental organisations for earthquake survivors should be extended and sustained at individual, group and community levels over time. Access to psychosocial support services for all earthquake survivors, especially for women earthquake survivors, should be increased and the effectiveness of these services should be improved. In addition, cooperation and coordination should be ensured among all stakeholders such as public institutions, local administrations, non-governmental organisations, academic institutions, and

other relevant organisations in earthquake zones. This co-operation is important for effective planning and implementation of pre-earthquake preparedness, emergency management, relief, and support services.

Scientists who are experts on earthquakes draw attention to the importance of emergency planning in reducing post-earthquake trauma (Khan et al., 2023). For this reason, mandatory emergency plans should be established in regions with high earthquake risk and regular drills of these plans should be carried out. It is important that issues such as what the public should do in case of an earthquake, emergency communication channels, and gathering points should be conveyed to individuals and constantly reminded. In this way, panic and confusion during an earthquake can be prevented and the level of traumatic stress can be reduced.

Limitations

Although this research helps to understand the effect of spiritual well-being on the level of post-earthquake trauma, it has some limitations. The research data were obtained through a questionnaire form delivered via the internet to those who volunteered to participate in the study through convenience sampling and were based on the subjective responses of the participants. This situation limits the representativeness of the sample and affects the generalisability of the results. For this reason, it is recommended to conduct more comprehensive post-traumatic stress studies using different sampling methods. In addition, the fact that the study was conducted in the second month of the earthquake may have had positive/negative effects on the results due to timing. In addition, although the study examined the relationship between post-earthquake trauma level and spiritual well-being and sociodemographic variables, other potential influencing factors were not taken into consideration. Further research should be conducted to measure the effect of factors such as pre-earthquake trauma history, social support network, and psychological resilience on trauma level. Finally, the findings of this study do not provide an evaluation on the access of earthquake survivors to post-traumatic psychosocial support services or the effectiveness of these services. It is recommended that more comprehensive studies be conducted to evaluate the accessibility and effectiveness of existing psychosocial support services.

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Authors' contribution.

Conceptualization, Z.K. and E.T.; methodology Z.K.; software, Z.K.; validation, E.T.; formal analysis, Z.K.; investigation, E.T.; resources, Z.K.; data curation, Z.K.; writing—original draft preparation, Z.K. and E.T.; writing—review and editing,

Z.K.; visualization, Z.K.; project administration, Z.K. and E.T.; All authors have read and agreed to the published version of the manuscript.

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Data Availability Statements.

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

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