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The Impact of earthquake trauma and experience on positive future expectations in Türkiye: mediating roles of resilience and religious attitude

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Abstract

Background In recent years, the occurrence of natural disasters has been on the rise globally, including in Türkiye. On February 6, 2023, a powerful earthquake with its epicentre in Kahramanmaraş, Türkiye, impacted 10 provinces, resulting in widespread devastation, significant loss of life, and deep trauma for many individuals. This study examines the mediating roles of psychological resilience and religiosity in the relationship between earthquake trauma and positive future expectancy.

Methods Employing a cross-sectional design, data were collected through an online survey from 1,412 participants who completed the Post-Earthquake Trauma Level Determining Scale, the Positive Expectations Towards the Future Scale, the Religious Attitude Scale, and the Brief Resilience Scale.

Results The results indicated that trauma from the earthquake was linked to increased religiosity and reduced psychological resilience. The trauma was higher in those exposed to the earthquake than in those not exposed, and positive future expectation was positively correlated with religiosity and resilience. Both religiosity and psychological resilience were found to play an indirect role in influencing the relationship between earthquake-related trauma and positive expectations for the future.

Conclusions These findings highlight the potential roles of religiosity and psychological resilience in supporting the psychological well-being of trauma survivors. While the cross-sectional design limits causal inference, the results may inform future research and discussions on how these factors could be considered in recovery and intervention contexts.

Keywords Trauma, Earthquake, Positive Expectations, Psychological Resilience, Religiosity

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Introduction

Natural disasters deeply affect the regions where they occur, with their economic, psychological, social, and emotional dimensions [1]. According to the Disaster and Emergency Management Presidency of Türkiye, on 6 February 2023, two earthquakes that occurred nine hours apart in the Pazarcık (magnitude 7.7) and Elbistan (magnitude 7.6) districts of Kahramanmaraş in the south and southeast of Türkiye had serious effects on the people living in the region [2]. Regarding its consequences, Türkiye has experienced one of the most devastating disasters of the last century. The earth tremors caused by the earthquakes were felt in many cities of the country and caused serious destruction in 11 cities. According to the data shared by the Ministry of Environment, Urbanization, and Climate Change, 205,534 houses were severely damaged due to the 6 February Kahramanmaraş earthquake. As a result of the earthquakes, 50,783 people died, and the number of injured people reached 122,000 [3]. According to the International Organization for Migration [4], 3 million people migrated from their homes. The 6 February earthquakes left behind serious economic, physical, psychological, and spiritual destruction. Due to the damage caused by the earthquakes, people's normal lives were disrupted. The earthquakes negatively affected not only the physical spaces and infrastructure but also the social fabric of society and the psychological health of individuals [5–7]. Many lost some or all of their family members due to the earthquake. In addition, women, children and refugees faced health, education, safety, shelter and harassment problems in addition to their pre-existing ones [8–11].

Natural disasters such as earthquakes have been shown to result in significant psychological consequences, including post-traumatic stress disorder (PTSD) [12–14], depression [15, 16], generalized anxiety [15, 17], substance use, adjustment disorders, and emotion regulation difficulties [18, 19]. Studies conducted in Türkiye following previous earthquakes documented somatic symptoms and PTSD among survivors [20, 21], while recent findings from the 6 February Kahramanmaraş earthquake revealed high levels of trauma among university students [22]. Individuals exposed to earthquakes may experience injuries, helplessness, anxiety, and intense fear of death, and those who witness casualties often report heightened psychological distress [23]. For example, a study conducted after a 7 magnitude earthquake in the Jiuzhaigou district of Sichuan, China, reported a PTSD prevalence of 46.3% [24]. These consequences can significantly disrupt daily functioning and highlight the urgent need to identify protective factors that mitigate trauma's long-term effects and support adaptation to new circumstances. Building on this evidence, the current study examines the mediating roles of religiosity and psychological resilience in the relationship between earthquake-related trauma and positive future expectancy, thereby contributing to a deeper understanding of how individuals cope with and adapt to disaster experiences.

Resilience

Psychological resilience in disaster contexts has been defined as the internal capacity to adapt, recover, and rebuild oneself to survive [25]. Resilience fosters positive future expectations, as shown in adolescents affected by the 2008 Sichuan earthquake [26], and is supported by adaptive cognitive emotion regulation strategies such as positive reappraisal, acceptance, and planning [27]. Resilient individuals are often able to restore functioning after stressful events and maintain mental balance despite losses and challenges [28, 29]. Disaster preparedness interventions have also been found to enhance resilience, particularly among older adults [30].

Resilience is commonly understood through the dual concepts of adversity and adaptation, reflecting a strength-based stress response [31]. Individuals with robust resilience are more capable of overcoming difficult circumstances and may even flourish in adversity [32, 33]. Importantly, resilience is distinct from coping and recovery, though it interacts with both. Empirical evidence consistently shows that resilience buffers against psychological disorders such as PTSD and depression following traumatic events [34–37].

Studies across different disaster contexts demonstrate the protective role of resilience. For example, resilience reduced PTSD symptoms after earthquakes in China [38], lowered trauma levels in Nepal [39], and was associated with fewer depressive symptoms and better functioning among survivors of the 2011 Japan earthquake and tsunami [13]. In Türkiye, research following the 2011 Van earthquake found that resilience was effective in coping with stress and reducing trauma-related symptoms [40, 41]. Collectively, these findings underscore resilience as a critical factor in mitigating trauma and promoting well-being in disaster-exposed populations. This evidence provides the rationale for examining resilience as a mediating variable in the current study, particularly in relation to earthquake-related trauma and positive future expectations.

Religiosity

Individuals who were affected by the earthquake attempt to cope with the losses, pain, and traumas they experienced in a variety of ways. Prayer, worship, social support, helping others, distraction, and religious orientation are some of the post-earthquake trauma coping mechanisms [42]. Religion is one way people cope with stressful events. People in difficult situations may engage in religious behaviours such as praying and worshipping,

believing in God's help, and serving others for God's sake [43, 44]. According to studies, people affected by the earthquake used religious coping strategies to deal with the aftermath [45, 46]. Throughout human history, religions have influenced the beliefs of every society as well as their attitudes towards education, health, the environment and stressful events [47–49]. In the Yushu earthquake in China's Qinghai Province, the degree of religiosity was found to be positively associated with people's willingness to seek religious support and the importance of spiritual support after the disaster [50]. A study in Türkiye found that spirituality was effective in reducing earthquake trauma [51]. In research conducted in Japan after the Great East Japan Earthquake of 2011, it was understood that the meanings of the spiritual and religious language and symbols of people in local communities were useful in healing people's grief and pain [52].

Religious coping has been one of the most effective and consistent coping strategies for those affected by the Haiti earthquake [53]. Research indicates a link between regular prayer and post-traumatic growth [54, 55]. Seo & Lee [55] revealed that the PTSD scores of individuals exposed to an earthquake differed significantly between those who reported religious affiliation and those who did not, with the PTSD level being lower in those who reported religious affiliation. In the study by Ali et al. [45] examining protective factors against PTSD after the earthquake in Pakistan, it was found that having a religious tendency had effects on PTSD and earthquake trauma and was a helpful factor in adaptation. They argued that spirituality and participation in religious activities serve as resilience-promoting, protective, and buffering functions in disaster survivors' experiences. Hobfoll et al. [56] found that religious people had a lower risk of developing PTSD. Therefore, religious attitudes and spirituality help them recover from trauma by helping them understand and interpret the troubles they face. Additionally, participation in religious activities contributes to social support for disaster victims by providing improved communication opportunities.

Positive future expectancy

Positive future expectancy plays a vital role in alleviating trauma symptoms following events like earthquakes and in facilitating individuals' reintegration into life. Earthquakes often bring about profound losses, injuries, and dramatic shifts in daily routines, which can lead individuals to stray from optimism and a positive outlook on the future [57]. However, maintaining positive future expectancy—often viewed as a reflection of optimism—helps mitigate these negative consequences and supports coping mechanisms in the aftermath of such disasters. Optimism and positive future expectations are inherently interconnected. Carver et al. [58] define optimism as a tendency to anticipate positive outcomes, while Kannis-Dymand et al. [59] describe it as a general inclination to expect favorable events in the future. These positive expectations are closely tied to resilience, as they empower individuals to better manage stress in the face of uncontrollable situations like earthquakes.

Studies show the importance of positive future expectancy in trauma recovery. Positive future expectancy is a key personality trait that allows individuals to cope effectively with stress after traumatic events [60]. People with an optimistic personality are more likely to develop successful strategies for reducing stress, enhancing their capacity for resilience [61]. Research by Gero et al. [62] highlighted that positive personality traits like optimism and hope, present before a disaster, promote resilience to PTSD following the event. Similarly, Souri & Hasanirad [63] found a significant link between optimism and resilience among medical students. The influence of hope in fostering resilience and facilitating recovery from trauma is also well-documented. Long [64] reviewed evidence supporting the role of hope in post-traumatic recovery, noting a strong negative relationship between PTSD and hope for the future. Individuals who maintain hope are better equipped to manage the psychological challenges posed by traumatic experiences, as hope contributes significantly to their ability to adapt and recover.

Present study

Building on the above-mentioned evidence, religiosity and psychological resilience have emerged as theoretically and empirically important constructs in disaster research. Religiosity has been linked to meaning-making, coping, and social support, while resilience reflects the capacity to adapt and recover in the face of adversity. Together, these factors may provide explanatory value beyond other established resilience-related mechanisms by fostering positive future expectancy and psychological well-being among survivors. As such, the present study employs structural equation modelling (SEM) to test a mediation model in which religiosity and psychological resilience are hypothesized to mediate the relationship between earthquake-related trauma and positive future expectations. The proposed model, depicted in Fig. 1, is grounded in prior literature suggesting direct and indirect pathways among these variables. The findings are expected to contribute empirical evidence on factors associated with earthquake trauma in Türkiye and to offer insights that may inform the development of appropriate interventions. Based on this framework, the following direct and indirect hypotheses were formulated and are illustrated in Fig. 1.

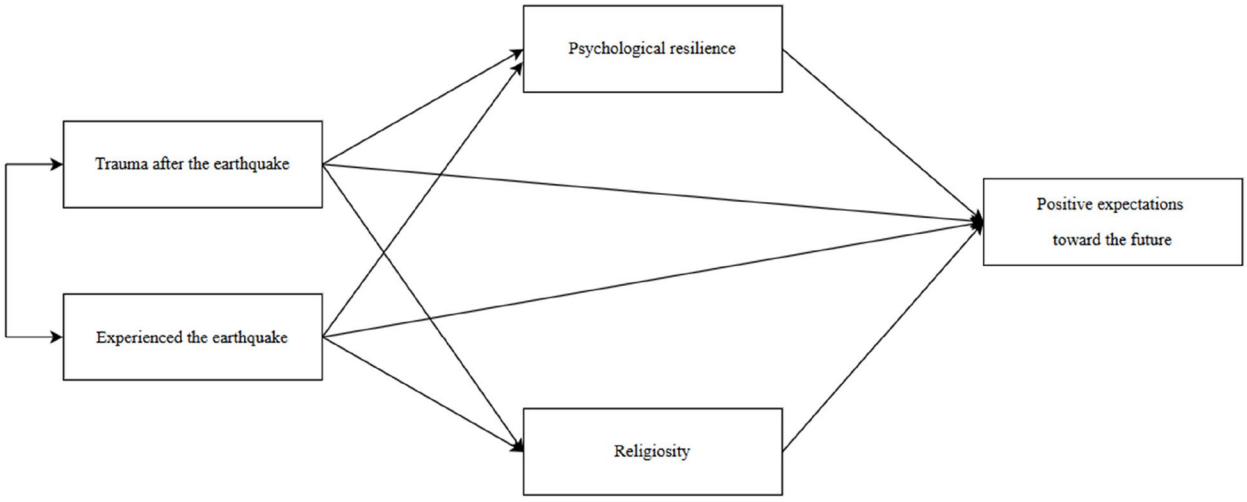

Fig. 1 Conceptual model of the research

H1. There is a negative relationship between trauma after the earthquake (i) and experiencing the earthquake (ii) and psychological resilience.
H2. There is a positive relationship between trauma after the earthquake (i) and experiencing the earthquake (ii) and religiosity.
H3. There is a negative relationship between trauma after the earthquake (i) and experiencing the earthquake (ii), and positive expectations toward the future.
H4. There are mediating effects through psychological resilience and religiosity in the relationship between trauma after the earthquake (i) and experiencing the earthquake (ii), and positive expectations towards the future.

Method

Participants

The participants of this study consisted of people who experienced the 6 February Kahramanmaraş earthquakes or who did not feel the earthquake directly but were indirectly affected by the earthquake by following the developments related to the earthquake on social media or television channels. In this study, data were collected through an online survey (SurveyMonkey). Non-random convenience sampling was used due to the focus on individuals affected by the earthquake, a specific population not easily accessible through random sampling methods. Participants were recruited via community centers, social media, and local support organizations. A total of 1653 participants participated in the study. However, after deleting missing data, incorrect and multiple data entries, the sample size became 1412. The study sample with 476 (33.7%) males and 936 (66.3%) females. 417 (29.5%) were married, 976 (69.1%) were single, 19 (1.3%) were divorced, and the average age was 27.08 (SD = 8.73). The research determined that 682 participants (48.3%) were exposed to the February 6 Kahramanmaraş earthquakes. Data were collected by sharing the online questionnaire on social media channels. Private information was not included in the questionnaire. Each questionnaire took approximately 15 min to answer. During the data collection process, there was no violation of the Helsinki Declaration criteria. Informed consent was obtained by informing the participants about the purpose and scope of the research before starting the survey.

Measures

The Post-Earthquake Trauma Level Determining Scale was developed by Tanhan and Kayri [65] to measure trauma symptoms that may occur in individuals after an earthquake. The scale consists of 20 items and 5 dimensions. The internal consistency coefficient calculated for the scale was .87. A score in the range of 52.385 ± 5.051 corresponds to a threshold value indicating that individuals are traumatized. A value above or below this value indicates a high or low level of showing post-earthquake traumatic symptoms.

The Positive Expectations Towards Future was developed by İmamoğlu [66] and aims to measure the degree of positivity of individuals' expectations about their future. The alpha reliability coefficient of the scale was reported as 0.85. It is a 5-point Likert-type scale consisting of 5 items. High scores on the scale indicate that the person has positive expectations for the future.

The Religious Attitude Scale was developed by Ok [67]. The scale was designed to measure individuals' relationship with God. The scale was found to have a high internal consistency of .81. A high score on the 5-point Likert scale indicates a high level of religious attitude, and a low score indicates a low level of religious attitude.

The Brief Resilience Scale was developed to measure the psychological resilience levels of individuals. The internal consistency coefficient of the scale was .83. The scale was adapted to Turkish culture by Doğan [68]. The scale consists of 6 items and is a 5-point Likert-style subjective evaluation scale.

Procedures

The online survey was delivered to participants through social media channels, and data were collected. Since the surveys were filled out anonymously, the personal information of the participants was not included in the questionnaire. It took approximately 7 min to answer each questionnaire. During the research process, no action was taken in violation of the Helsinki Declaration criteria. The study received the necessary approval from the Ethics Committee of Dicle University (reference number: E-14679147–663.05–512707). Data were collected between June 2023 and July 2023. During the data collection phase, the participants were informed of the purpose and scope of the research, the process, and the researchers through the informed consent attached to the questionnaire.

Analyses

The data were analyzed using IBM SPSS Statistics 26.0. Following collection, the dataset was cleaned and edited in Microsoft Excel before being imported into SPSS, where variables were coded according to their respective scales and factors. Internal consistency coefficients were calculated for all study measures, providing evidence of reliability and supporting confidence that the items consistently captured the intended constructs. Confirmatory factor analysis was then conducted using AMOS, after which data imputation was performed based on the resulting factor structure, and a new SPSS file was generated. Descriptive statistics and correlation analyses were carried out on this dataset. The hypothesized model (Fig. 1) was tested through path analysis in AMOS. Variance inflation factor (VIF) values ranged between 1 and 2, indicating no multicollinearity issues. Before analysis, normality was assessed; skewness and kurtosis values for all items fell between 1.50 and +1.50, confirming normal distribution [69]. In the research model, "experienced the earthquake" was treated as an observed variable, while "trauma after the earthquake," "religiosity," "psychological resilience," and "positive future expectations" were modelled as latent variables.

Table 1 Measurement model and SEM path analysis values

Measure	Measurement Values	Path Values	Cut-off Criteria
CMIN/DF	4.081	4.171	< 5
CFI	0.953	0.949	> 0.90
SRMR	0.055	0.055	< 0.08
RMSEA	0.047	0.047	< 0.08
NFI	0.939	0.939	> 0.90
GFI	0.931	0.931	> 0.90
IFI	0.953	0.953	> 0.90
AGFI	0.917	0.917	> 0.90
TLI	0.947	0.947	> 0.90

Results

Preliminary analyses

Confirmatory factor analysis was conducted using AMOS 24 software to assess the measurement model developed in the study. The initial analysis revealed that the necessary measurement values were marginally below the cut-off values established by Kline. The program's modification indices were utilized to ascertain the optimal number of covariances necessary to attain the desired fit values. Based on the covariance calculations, model fit, and path analysis, the values satisfied the criteria established by Kline [70]. Thus, the values derived from the confirmatory factor analysis measurement model and path analysis met the threshold values set by Kline, as presented in Table 1.

Correlations, reliabilities, means, standard deviations

After obtaining the fit values of the measurement model through confirmatory factor analysis, a new data file was created by data imputation analysis. Table 2 shows the correlation, mean and standard deviation values of the variables in this study. Cronbach's alpha values obtained for the reliability of the variables were above 0.75. With correlation analyses, trauma after the earthquake (Trauma after the earthquake) was found to be negatively related to positive expectations towards the future ($r = -0.343$, $p < 0.01$) and psychological resilience ($r = -0.699$, $p < 0.01$) and positively related to experiencing the earthquake. (Experienced the earthquake) variable ($r = 0{,}219$, $p < 0.01$) and religiosity ($r = 0.167$, $p < 0.01$). Positive associations were for positive expectations towards the future with psychological resilience ($r = 0.498$, $p < 0.01$), religiosity ($r = 0.314$, $p < 0.01$) and negative associations with having experienced the earthquake ($r = -0.053$, $p < 0.05$). There was a negative relationship between psychological resilience and religiosity ($r = -0.102$, $p < 0.01$) and experiencing the earthquake ($r = -0.090$, $p < 0.01$). It was observed that there was a positive correlation between religiosity and experiencing the earthquake ($r = 0.098$, $p < 0.01$), as seen in Table 2. Direct, Total and Indirect SEM Analyses.

Direct, total and indirect SEM analyses

The SEM path analysis conducted using Amos 24 revealed that the model path values obtained were within a close range of the cut-off values. Direct path analysis revealed that trauma after the earthquake (Trauma after

Table 2 Correlations, reliabilities, means, and standard deviations

No	Variables	1	2	3	4	5	6	7
1	Trauma after the earthquake	1						
2	Positive expectations towards the future	-.343**	1					
3	Psychological resilience	-.699**	.498**	1				
4	Religiosity	.167**	.314**	-.102**	1			
5	Experienced the Earthquake (1–2)	.219**	−0.053*	−0.09**	0.10**	1		
6	Gender (1–2)	.421**	-.193**	-.374**	.072**	0.01	1	
7	Age	-.164**	.169**	.185**	.070**	0.02	-.309**	1
	Cronbach's alpha	0.91	0.883	0.828	0.914			
	Mean	1.8232	3.1813	1.5913	3.619	1.52	1.66	27.08
	Standard deviation	0.6187	0.8271	0.6011	0.968	0.5	0.473	8.732

Experienced the Earthquake: 1 = No, 2 = Yes; Gender: 1 = Female, 2 = Male

*$p < 0.05$; ** $p < 0.01$

Table 3 Direct, total and indirect SEM analyses

Direct Paths			St. Est	S.E	C:R	p
Trauma after the earthquake	–>	Religiosity	0.138	0.047	4.558	***
Trauma after the earthquake	–>	Psychological resilience	−0.649	0.047	−13.723	***
Experienced the earthquake (1–2)	–>	Religiosity	0.069	0.057	−2.431	*
Experienced the earthquake (1–2)	–>	Psychological resilience	0.087	0.033	−3.438	***
Religiosity	–>	Positive expectations towards the future	0.322	0.023	11.762	***
Psychological resilience	–>	Positive expectations towards the future	0.404	0.055	9.626	***
Trauma after the earthquake	–>	Positive expectations towards the future	−0.074	0.05	−1.931	0.054
Experienced the earthquake (1–2)	–>	Positive expectations towards the future	−0.044	0.044	1.722	0.085
Total Effect	**St. Est**	**Lower**	**Upper**	**S.E**	***P*-Value**	
Trauma after the earthquake –> Positive expectations towards the future	−0.291	−0.237	−0.342	0.032	0.001	***
Experienced the earthquake –> Positive expectations towards the future	0.013	−0.032	0.060	0.028	0.62	n.s
Indirect Effects						
Trauma after the earthquake –> Positive expectations towards the future (total ind.)	−0.218	−0.273	−0.161	0.034	0.001	***
Experienced the earthquake –> Positive expectations towards the future (total ind.)	0.057	0.035	0.082	0.014	0.001	***

All models explained 28% of the variance in positive expectations towards the future

n.s. Not significant

*$p < 0.05$; *** $p < 0.001$

the earthquake) had a positive effect on religiosity and a negative effect on psychological resilience, whereas experiencing the earthquake (Experienced the earthquake) had no effect on religiosity or psychological resilience. The variable had a statistically significant positive effect on religiosity and psychological resilience. Religiosity and psychological resilience were found to have a positive impact on positive expectations towards the future. The total effect of Trauma after the Earthquake (Trauma after the earthquake) on positive future expectations was significant ($\beta = -0.291$, $p = 0.001$), whereas the total effect of experiencing the earthquake (Experienced the earthquake) on positive expectations towards the future was not significant ($\beta = 0.013$, $p = 0.62$). Furthermore, in the indirect analysis, a noteworthy mediation was observed in the pathway from Trauma after the earthquake to positive expectations towards the future via religiosity and psychological resilience ($\gamma = -0.218$, $p = 0.001$, 95% CI [−0.273, −0.161]). Furthermore, it was recognised that religiosity and psychological resilience mediated the connection between experiencing the earthquake and positive expectations towards the future ($\gamma = 0.057$, $p = 0.001$, 95% CI [0.035, 0.082]). Both mediation analyses revealed that the upper and lower-level confidence intervals, as shown in Table 3, did not contain zero.

Discussion

The primary aim of this study was to examine the mediating roles of psychological resilience and religiosity in the relationship between earthquake-related trauma and

positive future expectations among university students in Türkiye. By testing this model through structural equation modelling, the study sought to clarify how these protective factors contribute to psychological well-being in the aftermath of disaster. The findings are discussed below in relation to existing literature on trauma, resilience, and religiosity, with attention to their potential roles in recovery and intervention contexts.

The findings supported H1, revealing a negative relationship between psychological resilience and both earthquake-related trauma and the experience of having lived through the earthquake. Psychological resilience refers to people's ability to resist and cope with stressful life events caused by natural disasters such as earthquakes [71]. A study examined the relationship between psychological resilience and trauma levels in 379 households affected by the earthquake in Van, Türkiye, finding that earthquakes have a significant negative psychological impact on disaster survivors [72]. Participants reported sleep problems, cognitive problems like recurring flashbacks and intrusive thoughts about the earthquake, emotional problems like anhedonia, and physical and behavioural problems like anorexia, agoraphobia, and aggression.

Psychological resilience can serve as a buffer against the problems that individuals may experience after an earthquake. Resilience can be defined as a very important protective factor against post-disaster PTSD, depression, or other mental health problems [13, 73]. In addition, the effect of psychological resilience on the level of trauma after the earthquake depends on the severity of the earthquake, the losses experienced by individuals, and the stress level to which they were exposed. In this study, it is understood that psychological resilience has shown its effect on individuals directly exposed to the earthquake and indirectly affected by the earthquake.

In the study, the H2 hypothesis was tested and supported. The results revealed positive associations between post-earthquake trauma, earthquake experience, and religiosity. It was observed that individuals who experienced traumatic events, such as an earthquake, reported higher levels of religiosity. In a study conducted on 125 earthquake victims admitted to six hospitals in Lahore shortly after the earthquake in Pakistan, it was found that 72% of the participants "coped by asking God to forgive their sins" [74]. In another study, some earthquake survivors reported an expansion of their religious and spiritual perspectives, interpreting the experience as a step closer to God. Despite enduring loss, participants demonstrated post-traumatic growth by finding meaning in their suffering [75]. Similarly, another study found that increased religiosity can both heighten PTSD and facilitate post-traumatic growth after the earthquake [76]. Religiousness and spirituality can also function as a coping mechanism. In a study conducted with traumatized individuals, it was found that they tried to cope with post-crisis problems through spirituality, thus overcoming difficulties positively by supporting God [77]. In a study conducted after the earthquake in Korea in 2017, it was found that PTSD in individuals exposed to the earthquake was more severe in married individuals, those not affiliated with any religion, those with low income, and those more exposed to the earthquake [55]. In some studies, Negative religious coping, the feeling of being punished by God for one's sins or lack of spirituality, was significantly associated with higher symptom levels. In a study conducted with earthquake victims in Pakistan, negative religious coping was associated with PTSD [46].

Another finding of the study indicates a negative relationship between the level of trauma experienced after the earthquake and individuals' positive expectations for the future. Thus, the H3 of the study was supported. This relationship is about how individuals' expectations for the future are related to the traumas they experience after a negative event. The Turkish Psychiatric Association (2023) highlighted that individuals suffering from PTSD disorder following a traumatic event often experience hopelessness about the future. Supporting this, several studies indicated that people with high levels of trauma tend to have more negative future expectations and express fewer positive outlooks (e.g., [57]). For instance, after the Kahramanmaraş Earthquakes, university students reported persistent unease, frequent memories of the event, and significant concerns about their future [22]. These findings suggest that traumatic events can adversely affect individuals' beliefs and thoughts, diminishing their optimism and leading to increased pessimism about what lies ahead.

One important contribution of this study to the literature is the finding that psychological resilience and religiosity mediate the relationship between post-earthquake trauma and exposure, and positive future expectations. Accordingly, hypothesis H4 was supported. The mediator variables in the research model showed significant associations with both the independent and dependent variables, indicating that an indirect effect exists between these variables through the mediators. The observed negative relationship between trauma after the earthquake and psychological resilience, along with the positive association between psychological resilience and positive future expectations, is well-documented in the literature. Positive future expectations and psychological resilience often coexist during adverse events, and an interactive relationship between these variables can occur under negative circumstances [63].

The current study found that psychological resilience and religiosity play an important role in mitigating the negative impact of earthquake exposure and trauma on positive expectations toward the future. Individuals

who have experienced an earthquake and its subsequent trauma may draw on both psychological resilience and religiosity to strengthen their positive future expectations and inner resources. Strengthening religious beliefs can foster stronger social bonds and provide individuals with comfort and resilience [42]. During disasters, religious communities and places of worship offer spaces for solidarity and spiritual connection, encouraging more frequent prayer and worship. Religiosity can also positively influence future expectations by enhancing faith and providing hope, which helps individuals overcome challenges and maintain optimism [78]. Through the uplifting effect of religious beliefs and practices, individuals may reinterpret their lives following trauma, finding renewed meaning and strength. Additionally, the supportive religious environment reinforces a sense of community, enabling trauma survivors to face the future with confidence.

Limitations

Despite the valuable findings of this study, several limitations should be acknowledged. First, because this study was conducted using a cross-sectional design, the findings should be interpreted with caution. The associations we observed reflect relationships at a single point in time and do not allow us to determine cause and effect. While the results provide useful evidence about the relationships between the study variables, future studies using longitudinal or experimental approaches will be needed to clarify the direction and underlying mechanisms of these associations. Second, the data were collected within a single national context, which may limit the generalizability of the results across different cultures. Replicating this study with earthquake survivors from diverse countries would enhance the robustness and applicability of the findings. Additionally, as the data were gathered online, non-verbal cues such as facial expressions and in-depth personal insights regarding the sensitive topic of earthquake trauma could not be captured. Furthermore, future studies should employ longitudinal designs to explore how psychological resilience and religiosity influence trauma recovery and future expectations over time. Expanding research across diverse cultural and geographical contexts will improve the generalizability of findings and identify culturally specific factors. Researchers are also encouraged to investigate the mechanisms through which religiosity supports coping and growth after disasters and to explore other potential mediators or moderators in this process. Finally, mixed-methods approaches could deepen understanding by capturing individuals' lived experiences, including spiritual and emotional dimensions, that may be overlooked in quantitative studies.

Conclusion and implications

This study examined the mediating roles of psychological resilience and religiosity in the relationship between earthquake-related trauma and individuals' future expectations. The findings highlight that both psychological resilience and religiosity are vital in fostering positive outlooks following an earthquake. Resilience emerged as a key factor enabling individuals to cope effectively with traumatic experiences, while religiosity contributed to recovery by helping individuals find meaning and hope through beliefs and spiritual practices.

Based on these findings, several practical implications can be drawn. First, resilience-building interventions should be integrated into disaster preparedness and recovery programs. Training programs and community workshops can focus on strengthening adaptive coping and emotion regulation skills, which were shown to buffer trauma and support positive expectations. Prior studies have similarly emphasized the protective role of resilience in disaster contexts.

Second, the results underscore the importance of acknowledging and incorporating religious and spiritual resources into psychosocial support. Religiosity provided survivors with meaning-making and hope, consistent with earlier research linking spiritual frameworks to enhanced recovery. Collaboration with religious leaders and faith-based organizations can therefore strengthen community solidarity and facilitate collective healing.

Third, a valuable implication is the need for bidirectional education. Mental health professionals should be trained to understand local cultural and religious frameworks, ensuring that interventions are culturally sensitive and contextually relevant. Conversely, religious leaders can be educated about psychological resilience and mental health, enabling them to play a more informed role in community-based recovery and resilience programs. This reciprocal exchange can bridge gaps between professional and community-based support systems, enhancing the effectiveness of post-disaster interventions.

In sum, the results suggest the critical importance of psychological resilience and religiosity in the recovery and rebuilding of both individuals and communities affected by earthquakes in Türkiye. Accordingly, educators, mental health professionals, and policymakers should incorporate strategies that foster resilience and acknowledge the supportive role of religiosity when designing preparedness and recovery programs for future traumatic events.

Abbreviations

PTSD	Post-traumatic stress disorder
VIF	Variance inflation factor
SEM	Structural equation modelling
CI	Confidence interval
SPSS	Statistical Package for the Social Sciences
AMOS	Analysis of Moment Structures

n.s. Not significant

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Authors' contributions
Conceptualization: OK; Methodology: OK, HA, OT; Software: OK; Formal analysis: OK; Investigation: HA, OT; Data Curation: OK; Visualization: OK; Supervision & Validation: MY; Project administration: HA, OT; Writing - Original Draft: OK, HA, OT, MY; Writing - Review & Editing: MY, AMAA, JGS.

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Data availability
The data supporting this study's findings are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study received the necessary approval from the Ethics Committee of Dicle University (reference number: E-14679147-663.05-512707). We confirm that all participants provided informed consent before taking part in the study. This ensures that they were fully aware of the study's purpose, procedures, potential risks, and their right to withdraw at any time.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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