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ORIGINAL PAPER

The Turkish adaptation of the fear of earthquake scale

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Abstract

This study was conducted to adapt the Fear of Earthquake Scale to Turkish. The methodological study, in which individuals in the 15–65 age group were included in the study, was carried out between March–April 2023. The sample consisted of 1054 participants 15 to 65 years of age divided into two for explanatory factor analysis (n = 431) and confirmatory factor analysis (n = 623). The original Fear of Earthquake Scale has a one, factor structure with 7 items. The explanatory factor analysis (EFA) sample had a mean age of 26.6 + 6.7 years. Over half of the EFA participants were women (65.1%) and single (69.8%). The Turkish version of the Fear of Earthquake Scale has acceptable content and construct validity. It consists of seven items without subscales. It accounts for 65.8% of the total variance, which is quite high for a single-factor scale. It has a Cronbach's alpha of 0.91, indicating high reliability. The original Fear of Earthquake Scale items are scored on a five-point Likert scale. No items are reverse-scored. The total score is the sum of the item scores. The total score ranges from 7 to 35, with higher scores indicating greater fear of earthquakes. The results indicate that the Turkish version of the Fear of Earthquake Scale is a valid and reliable instrument that can be used to assess Turkish people's fear of earthquakes.

Keywords Earthquake · Fear of earthquake · Reliability · Validity

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1 Introduction

arthquakes are a natural phenomenon that can result in fatalities, physical injuries, and psychological distress (Nakajima 2012). On October 8, 2005, a powerful earthquake measuring 7.6 (Mw) struck the Himalayan region and Kashmir in northern Pakistan. The Pakistani government initially reported a death toll of 87,350, but the actual number of fatalities is believed to exceed 100,000 (Kiani et al. 2016). Another devastating earthquake with a magnitude of 7.0 (Mw) occurred in Haiti on January 12, 2010, resulting in the loss of over two hundred thousand lives and injuring 300,000 people (Doocy et al. 2013). In Turkey, two major earthquakes struck Kahramanmaraş on February 06, 2023. The first earthquake hit Pazarcık with a magnitude of 7.7 (Mw), followed by a second earthquake in Elbistan with a magnitude of 7.6 (Mw). The Pazarcık earthquake occurred at a depth of 8.6 km, while the Elbistan earthquake occurred at a depth of 7 km. The Earthquake Preliminary Damage Estimation System in Turkey (AFAD-RED) produced a severity map, indicating that the Pazarcık earthquake is estimated to be at the Modified Mercalli Scale (MMI) XI, and the Elbistan earthquake at MMI X (AFAD 2023a, b). It is known that on February 6, 2023, two large earthquakes impact the Kahramanmaraş center in Turkey, killing over 50,000 people and affecting 16 million others. It is also true that earthquakes have a mental impact on humans. The impact of disasters on individuals is significant, with people facing immense psychological pressure as they cope with injuries, deaths, and material losses (AFAD 2023a, b).

Earthquakes are natural disasters that occur suddenly and without warning, posing a direct threat to the lives and safety of individuals, depending on their severity. As a result, people residing in earthquake-prone areas often experience a wide range of negative emotions and psychological distress, which can persist long after the event has taken place (Sumer et al. 2005). Research conducted by Oishi et al. (2017) revealed that individuals who have experienced an earthquake, irrespective of their sociodemographic status or personality traits, tend to exhibit low levels of life satisfaction. Kowalski and Kalayjian (2001) reported high levels of anxiety and fear among earthquake survivors in Turkey. Studies have indicated that survivors of natural disasters, including earthquakes, commonly exhibit symptoms of Posttraumatic Stress Disorder (PTSD) (Grimm et al. 2012; Kannis-Dymand et al. 2015; Rowney et al. 2014). In particular, Başoğlu et al. (2002) found a high prevalence of PTSD symptoms among earthquake survivors who experienced intense fear. Additionally, Salcioğlu et al. (2018) identified the fear of future earthquakes and a diminished sense of control over life as significant predictors of PTSD among earthquake survivors in Turkey. The severity of PTSD symptoms is associated with the magnitude of the incident and the intensity of fear experienced (Guerra et al. 2014). Natural disasters likely instill fear in individuals residing in or near the affected areas (Goltz 2016).

Disasters expose individuals to physical and psychological challenges, rendering them fragile and vulnerable in their daily lives. People often experience a range of emotions, such as anger, anxiety, sadness, and fear, when confronted with unexpected situations (Ahorsu et al. 2020; Brief et al. 2004). Fear serves as a distinguishing feature between normalcy and exceptional circumstances (Pappas et al. 2009). It is closely linked to feelings of powerlessness and helplessness that can arise when contemplating potential risks. Fear is an emotion that arises in anticipation of threats or dangers (Terpstra 2011). Research indicates that individuals who effectively cope with fear in extraordinary situations tend to develop more adaptive strategies to confront similar events (Greenberg et al. 1993). However, individuals who excessively fear disasters may disregard threats, suppress their emotions, and become socially disconnected, exhibiting antisocial behaviors (Carlino et al. 2008). Some scholars argue that a certain level of fear and anxiety can aid in understanding and preparing for disaster risks (Kohn et al. 2012).

Consequently, there exists a relationship between anxiety and preparedness. Miceli et al. (2008) established a significant positive association between preparedness, protective behaviors, and anxiety. According to the protection motivation theory, fear associated with earthquakes plays a crucial role in shaping one's perception and adoption of preventive measures (Li et al. 2023). Therefore, it can be stated that the level of fear can be an effective factor in preparing for disasters (Oakley et al. 2020).

During disasters, there exists a connection between human behavior and the level of fear experienced. For instance, in the context of earthquakes, individuals who are highly fearful tend to engage in active behaviors, while those with lower levels of fear may remain calm (Goltz and Bourque 2017). The manifestation of fear-driven behaviors is contingent upon the perceived threat's type, magnitude, and potential consequences (Espinola et al. 2016). Fear-based defense mechanisms enhance people's chances of survival in disasters and mass threats, enabling them to cope with fear and stress. These mechanisms facilitate sound decision-making and prompt action-taking (Shultz et al. 2016). Analyzing societal sentiments and trends pertaining to exceptional circumstances and devising innovative strategies can motivate the decision-making processes and enhance disaster preparedness efforts undertaken by disaster management authorities (Reynolds and Quinn 2008).

Previous studies have consistently found fear to be a prevalent emotional response following earthquakes in various regions, including Italy (Prati et al. 2012), New Zealand (O'Toole 2017), and Armenia (Khachadourian et al. 2016). Recognizing the significance of assessing psychological responses to earthquakes, Prizmić-Larsen et al. (2023) developed a scale specifically designed to measure fear and anxiety related to earthquakes. However, there is currently no culturally appropriate measurement tool available in the Turkish context that scientifically evaluates individuals' fear of earthquakes. Therefore, the objective of this study was to adapt the Fear of Earthquake Scale for use in the Turkish population.

2 Method

2.1 Research type

This methodological study aimed to adapt the Fear of Earthquake Scale for the Turkish population. The scale development process involved the following steps.

2.2 Finding a suitable scale

A comprehensive literature review was conducted to identify an appropriate scale for assessing the fear of earthquakes. The "Fear of Earthquake Scale" developed by Prizmić-Larsen et al. (2023) was identified as the most suitable scale for this study. The scale comprises 7 items rated on a 5-point Likert-type scale ranging from "Strongly Disagree" = 1 to "Strongly Agree" = 5. The total score on the scale ranges from 7 to 35.

2.3 Permission

Permission was obtained via e-mail from the authors who developed the measurement tool.

2.4 Translation

It is recommended to follow specific guidelines when translating a scale, such as involving independent experts and ensuring a consensus is reached. Accordingly, two translators with expertise in English Language and Literature independently completed the initial translation. One of the translators was informed about the purpose of the scale, while the other remained uninformed (Beaton et al. 2007; Dorer 2012). Following the translations, the researchers compared the two versions and carefully examined any differences in terms of semantics, idiomatic expressions, conceptual understanding, linguistic nuances, and contextual relevance. Through this evaluation process, the researchers discussed and reached a consensus on the final version of the items in Turkish.

2.5 Back translation

To ensure the accuracy and consistency of the translated scale, back translation is an important step. In line with recommended practices (Coster and Mancini 2015; Jesus and Valente 2016), two experts in English Language and Literature, who were not involved in the initial translation process, performed the back-translation of the Turkish version back into English. Subsequently, the researchers compared the back translated English versions with the original scale in English. It was found that there were minimal and insignificant differences between the back translated versions and the original scale. To further validate the translation, the researchers shared the back-translated version with the developers of the original scale. The original scale developers analyzed the back-translation for any potential shifts in meaning. Ultimately, the researchers concluded that the back-translated version and the original scale were highly similar in terms of meaning and cognitive aspects.

2.6 Expert feedback

The World Health Organization (WHO) recommends seeking expert opinions to identify vague concepts in translation (Jesus and Valente 2016) and to detect inconsistencies between two versions (Jesus and Valente 2016). In line with this recommendation, experts were engaged in the evaluation process of the translated scale. Each expert provided their opinion on each item, using a Likert type rating scale to determine whether an item was "necessary,“ "useful but unnecessary,“ or "unnecessary" (Yurdugul 2005). To ensure robust content validity, the Content Validity Index and Content Validity Ratio were calculated based on the opinions of a minimum of 5 and a maximum of 40 experts (Esin 2014; Yurdugul 2005).

The content validity ratio (CVR) is calculated by dividing the number of experts who express the "necessary" opinion on an item by half of the total number of experts and then subtracting one from this number (CVR = [NG/(N/2)] − 1). Items with a negative or 0 CVR are considered for removal from the scale. On the other hand, items with positive CVRs undergo further statistical analysis to determine their significance (Yurdugul 2005).

Veneziano and Hooper (1997) have developed a table that converts the minimum values (content validity ratios) into a $p < .05$ significance level for ease of calculation. This table helps determine the minimum number of experts required to establish the statistical significance of an item (Table 1).

While CVR is used to accept or reject an item, CVI is calculated for the whole test. A content validity index (CVI) is obtained by calculating the average of the CVR values of the accepted items (Lawshe 1975).

The researchers distributed the scale to a panel of 12 experts: six disaster management specialists, three psychiatrists, and three psychologists. The experts provided feedback on the scale, and the researchers revised the items based on their suggestions. The minimum content validity ratio (CVR) obtained from the 12 experts was 0.667, as recommended by Ayre and Scally (2014).

2.7 The initial version

After translating the scale and incorporating expert opinions, the researchers finalized the initial version of the scale. The items of the original scale are rated on a 5 point Likert type scale.

2.8 Pilot test

A pilot test was conducted with a sample of 30 participants to ensure the comprehensibility and clarity of the initial version. The selection of the pilot test sample aimed to mirror the characteristics of the target group for which the original scale was intended, including factors such as education level, age range, and gender (Erkuş 2014). It is recommended that the pilot test sample size should range between 20 and 50 individuals (Şeker and Gençdoğan 2006).

Table 1 Expert group content validity table

Number of the expert	CVR value	Number of the expert	CVR value	Number of the expert	CVR value	Number of the expert	CVR value
5	1	14	0.571	23	0.391	32	0.375
6	1	15	0,6	24	0.417	33	0.333
7	1	16	0.5	25	0.44	34	0.353
8	0.75	17	0.529	26	0.385	35	0.314
9	0.778	18	0.444	27	0.407	36	0.333
10	0.8	19	0.474	28	0.357	37	0.297
11	0.636	20	0.5	29	0.379	38	0.316
12	0.667	21	0.429	30	0.333	39	0.333
13	0.538	22	0.455	31	0.355	40	0.3

(Minimum/Critical Values of CVRs at α = 0.05 Significance Level (CVR = CVR critical)

*CVR value for 12 experts was 0.667

2.9 Population and sample

For this scale adaptation study, it is recommended to include a population of individuals aged 15 years and above. Since factor analysis is a requirement for this study, a sample size of 300 individuals is considered sufficient (Çokluk et al. 2014). Ho (2006) suggests that the sample size for factor analysis should not be below 100. According to Comrey and Lee's guidelines, a sample size of 100 is considered "poor," 200 is considered "fair," 300 is considered "good," 500 is considered "very good," and 1000 is considered "excellent" (Çokluk et al. 2014).

The sample consisted of 1054 participants divided into two for explanatory factor analysis (EFA; n = 431) and confirmatory factor analysis (CFA; n = 623). The sampling method used in this research is convenience sampling method. Researchers sent an online data collection link (Google Forms) to participants through various platforms to collect data. The EFA sample had a mean age of 26.6 ± 6.7 years. Over half of the EFA participants were women (65.1%) and single (69.8%). Less than half of the EFA participants had associate (46.2%) or bachelor's degrees (32.6%). The CFA sample had a mean age of 28.1 ± 9.6 years. More than half of the CFA participants were women (61.5%) and single (70.5%). Less than half of the CFA participants had associate (45.9%) or bachelor's degrees (33.4%).

2.10 Data analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS, v.26) and Analysis of Moment Structures (AMOS, version 23.0) at a significance level of 0.05. Descriptive statistics, including percentages and mean scores, were computed to summarize the data. EFA was used for determining the relationship between item and factor. Before conducting the EFA, the adequacy of the data for factor analysis was evaluated by using the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test sphericity. CFA was implemented to determine the construct validity, and 27% lower-upper group comparison was made to determine the internal validity. Convergent and discriminant validity were evaluated using the Average Variance Extracted (AVE), and Composite Reliability (CR), which were calculated using formulas available in the Microsoft Excel package program. The scale's reliability was assessed using Cronbach's alpha coefficient and the split-half test reliability.

Ethical Considerations The study was approved by the Scientific Research and Publication Ethics Committee of Artvin Çoruh University (No: E-18457941-050.99-87485 and Date: 04.04.2023).

3 Results

The first step involved conducting an EFA to examine if the Fear of Earthquake Scale in Turkish (FES-TR) exhibited a similar factor structure as the original FES. The second step involved performing CFA to confirm the factor structure. Convergent validity was assessed by examining factor loadings in the CFA. The CR and AVE values were calculated to assess convergent validity further. The third step involved using the "upper and lower 27% rule" to evaluate the discriminatory power of the scale items.

Table 2 Factor structure of the fear of earthquake scale

Item	Statement	Factor Loading
FE1	I am very afraid of earthquakes	0.79
FE2	Thinking about earthquakes upsets me	0.84
FE3	My hands sweat when I think about earthquakes	0.78
FE4	I am afraid of losing my life in an earthquake	0.76
FE5	I feel nervous or anxious when I watch news/stories about earthquakes in the media	0.81
FE6	I cannot sleep because I am worried about earthquakes	0.85
FE7	I cannot sleep because I am worried about earthquakes	0.86
	KMO = 0.89	
	Bartlett's test of sphericity = x^2: 1966.64; p: 0.000	
	Variance explained = 65.8%	

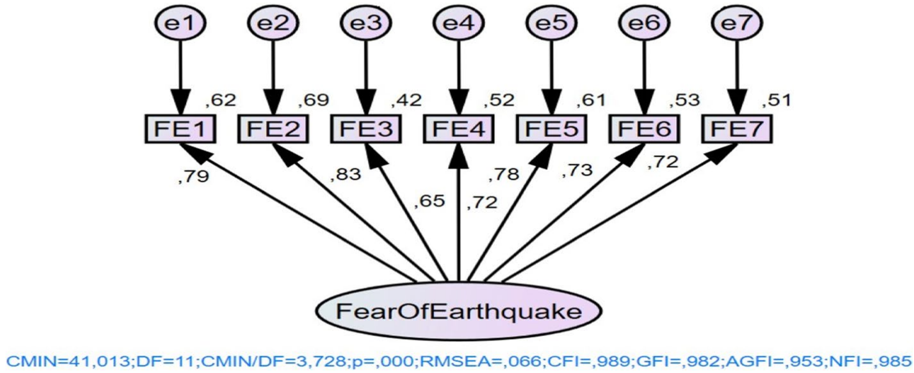

Fig. 1 The goodness of fit values related to earthquake fear scale

The scale's reliability was examined using the split-half test consistency and Cronbach's alpha coefficient.

3.1 Results of validity analysis

The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was found to be 0.89, indicating a high level of adequacy for factor analysis. Additionally, Bartlett's test of sphericity was significant (χ^2: 1966.64; p < .000), suggesting a correlation between the items and supporting the suitability of the data for factor analysis. The factor analysis results revealed a one-factor structure, with eigenvalues exceeding 1. This structure was consistent with the previous findings of Prizmić-Larsen et al. (2023). Furthermore, all items loaded significantly on the factor, with factor loadings ranging from 0.76 to 0.86. The one-factor structure accounted for 65.8% of the total variance, indicating a strong association between the items (Table 2).

The fit of the FES-TR model, which consisted of one factor with seven items, was examined through a first-order one-factor CFA. The data were found to be normally distributed, and the maximum likelihood estimation method was employed. The goodness-of-fit indices were as follows: χ^2 = 41.013, χ^2/df = 3.728, AGFI = 0.95, CFI = 0.99, GFI = 0.98, RMSA = 0.066, and NFI = 0.99 (see Fig. 1). These values indicate an adequate fit for the model, aligning with previous studies (Gürbüz and Şahin 2014; Meydan and Şeşen 2011; Polatci and Ünüvar 2021; Sümer 2000).

All latent variables in the model were significant at $p < .001$, with t-values of 16.06 to 22.03. The goodness-of-fit indices and their significances further support the one-factor structure of the scale, providing evidence for its construct validity (Table 3).

Convergent validity: The convergent validity of the FES-TR construct was assessed by calculating the CR values and AVE. The scale demonstrated a single-factor structure, so discriminant validity analysis was not applicable.

The AVE is calculated by summing the squares of the items' factor loadings (covariances) and dividing it by the number of items. It is a measure used to assess convergent validity. In order to demonstrate convergent validity, the AVE values of the items should be 0.50 or higher, as suggested by Bagozzi and Yi (1988).

CR, or construct reliability, is calculated using the factor loadings and error variances obtained from CFA. It represents the overall reliability of the construct. The formula for calculating CR is the ratio of the squared sum of the factor loadings to the sum of the squared sum of the factor loadings and error terms ($A^2/(A^2 + B)$). According to İlhan et al. (2015), CR values should be 0.70 or higher, indicating good reliability. However, Hair et al. (2010) suggest that a CR value of 0.60 to 0.70 can also be considered acceptable.

The items in the scale exhibited significant correlations, indicating a strong relationship between them. The construct showed an AVE value of 0.56, which indicates that the items explain a significant portion of the variance in the construct. The construct also had a CR value of 0.898, suggesting good reliability. The AVE value exceeding 0.50, CR value exceeding 0.70, and CR being greater than AVE demonstrate that the scale exhibits convergent validity, indicating that the items in the scale measure the same underlying construct effectively (Table 4).

3.1.1 Internal validity

Independent-groups t-test was used to test whether the items had internal validity. The internal validity of the FES-TR was assessed using the "upper and lower 27% rule." The findings revealed a statistically significant difference between the mean scores of the upper group, representing individuals with the highest fear of earthquakes, and the lower group, representing individuals with the lowest fear of earthquakes (t: − 48.840; $p < .001$). This indicates that the FES-TR has internal validity and can effectively distinguish between

Table 3 Earthquake fear scale confirmatory factor analysis results

No	$\bar{x}$	SS	Factor load	R^2	t	P
FE1	3.71	1.01	0.79	0.62	22.03	0.000
FE2	3.61	1.19	0.83	0.69	22.06	0.000
FE3	2.17	1.26	0.65	0.42	16.06	0.000
FE4	3.41	1.34	0.72	0.53	18.68	0.000
FE5	3.65	1.24	0.78	0.61	19.90	0.000
FE6	2.62	1.35	0.73	0.53	18.27	0.000
FE7	2.60	1.36	0.72	0.51	18.00	0.000

Table 4 Convergent validity of the fear of earthquake scale

	Item correlations							Convergent validity			
	FE1	FE2	FE3	FE4	FE5	FE6	FE7	λ	λ^2	$1-\lambda^2$	AVE/CR
FE1	1							0.724	0.524	0.475824	n = 7 AVE = 0.557 CR = 0.898
FE2	0.68	1						0.646	0.417	0.582684	
FE3	0.50	0.56	1					0.832	0.692	0.307776	
FE4	0.61	0.56	0.45	1				0.787	0.619	0.380631	
FE5	0.58	0.65	0.49	0.58	1			0.781	0.61	0.390039	
FE6	0.54	0.60	0.65	0.53	0.61	1		0.726	0.527	0.472924	
FE7	0.54	0.59	0.71	0.53	0.59	0.81	1	0.715	0.511	0.488775	

Table 5 Upper and lower 27% rule

Group	n	x	SS	Statistical	Significance
Lower group	116	12.7	2.7	t: − 48.840	*p*: 0.000
Upper group		30.6	2.9		

individuals with high and low fear of earthquakes, demonstrating its discriminant ability (Table 5).

3.2 Results of reliability analysis

Reliability refers to the consistency and stability of the results obtained from an instrument when it is administered multiple times under similar conditions, assuming that the underlying concept being measured remains unchanged. In other words, reliability is the degree to which a measurement instrument produces consistent and reliable results on different occasions or with different groups of participants. It assures that the instrument is reliable and that the observed scores are not solely due to measurement error or random fluctuations (Şencan 2005).

Two commonly used methods were employed to assess the instrument's reliability: Cronbach's alpha (α) and split-half test consistency. Cronbach's alpha is a measure of internal consistency, indicating how closely related the items within a scale are to each other. It ranges from 0 to 1, with higher values indicating greater internal consistency. A reliability coefficient of α above 0.70 is generally considered acceptable, and values closer to 1 suggest higher reliability (DeVellis 2014; Tezbaşaran 2008). Split-half test consistency involves dividing the scale into 2 halves and comparing the scores obtained from each half. The correlation between the two halves is expected to be as high and significant as possible. This method provides an estimate of the internal consistency reliability by examining the consistency of responses across different halves of the scale. A significant correlation between the two halves suggests good internal consistency and reliability. The study evaluated the instrument's reliability by employing these two methods, aiming for a Cronbach's alpha value above 0.70 and a strong and significant correlation between the two halves.

The results of the split-half consistency test showed a significant correlation between the two halves of the scale (r^2: 0.74, $p < .001$). This indicates a strong and positive relationship between the responses obtained from each half of the scale, indicating good internal consistency. In addition, Cronbach's alpha coefficient for the scale was calculated to be 0.91. This value exceeds the recommended threshold of 0.70, indicating a high level of internal consistency among the items. Based on these findings, it can be concluded that the scale has acceptable reliability, as evidenced by both the significant correlation between the two halves and the high Cronbach's alpha coefficient (Table 6).

4 Discussion

Turkey has a history of experiencing significant earthquakes, resulting in the loss of numerous lives, injuries, and the displacement of millions of people. Given these circumstances, evaluating the fear of earthquakes among the Turkish population becomes crucial. Earthquakes are often associated with a heightened perception of danger, threat, and potential harm, leading to the activation of fear responses. Therefore, this study aimed to adapt the Fear of Earthquake Scale (FES) developed by Prizmić-Larsen et al. (2023) into Turkish. The FES measures fear-related responses, including distressing thoughts about earthquakes, and physiological fear responses, like an increased heart rate when thinking about earthquakes (Prizmić-Larsen et al. 2023).

The evaluation of the FES involved examining its content, convergent, and construct validity through CFA and EFA Explanatory factor analysis is a crucial multivariate statistical technique to develop and validate conceptual frameworks and measurement instruments (Watkins 2018). In this study, EFA was employed to assess the scale's construct validity. Sampling adequacy was determined by calculating the KMO measure, which assesses the suitability of the data for factor analysis. A KMO value ranging from 0.90 to 1 is considered excellent, 0.80 to 0.89 is quite good, 0.70 to 0.79 is good, 0.60 to 0.69 is fair, 0.50 to 0.59 is poor, and a value below 0.50 is considered unacceptable (Yaşlıoğlu 2017). The FES-TR demonstrated a KMO value of 0.89 in this study, indicating "quite good" sampling adequacy. Bartlett's test of sphericity was conducted to examine the hypothesis that the correlation matrix was similar, indicating whether the data were suitable for factor analysis (Yaşlıoğlu 2017). The rejection of this hypothesis at $p<.001$ indicated that the data were appropriate for factor analysis.

CFA is conducted to validate the results obtained from the EFA (Brown 2015). Fit indices are examined to assess the validity of the factor structure. The original FES accounted for 58% of the total variance. The FES-TR exhibited a single-factor structure in this study, explaining 65.8% of the total variance. This high variance explained by a single factor is noteworthy for a scale. The CFA results indicated that the goodness of fit indices met the acceptable thresholds (Şencan 2005). The goodness of fit indices were as follows: $\chi^2 = 41.013$, $\chi^2/df = 3.728$, AGFI = 0.95, CFI = 0.99, GFI = 0.98, RMSA = 0.066, and NFI = 0.99, demonstrating that the FES-TR is a valid, reliable scale with a good fit. With its one-factor structure and seven items, the FES-TR can effectively assess individuals' fear of earthquakes. Consequently, no items were deemed necessary to be removed.

Table 6 Split-half test consistency and cronbach's alpha (α) internal consistency

Half	n	x	Ss.	r	r^2	*p*	Cronbach
First half	431	9.4	2.9	0.86	0.74	0.000	0.91
İkinci second half		9.5	3.3				

Reliability is an essential aspect of a scale as it reflects the consistency and stability of measurement. A reliable scale should yield consistent results when administered under similar conditions and at different times. It indicates all items' consistency and the measured phenomenon's stability (Şencan 2005). The original FES demonstrated a Cronbach's alpha of 0.90, indicating high internal consistency. In this study, the FES-TR exhibited a Cronbach's alpha of 0.91, suggesting that all items showed strong reliability and measured the same construct (DeVellis 2014). It is worth noting that Cronbach's alpha levels below 0.60 are considered unacceptable, while levels between 0.60 and 0.65 are considered undesirable. When Cronbach's alpha exceeds 0.90, it may indicate a need to shorten the scale. The high Cronbach's alpha value of 0.91 for the FES-TR indicates that the scale has strong internal consistency and reliability.

4.1 Limitations

This study has two limitations. First, the results are sample-specific and cannot be generalized to the Turkish population. Second, the data are based on self-reports. The FES-TR provides preliminary evidence of earthquake fear among individuals living in Turkey. It draws attention to the importance of research on earthquake fear and the need for prospective studies to develop disaster management strategies.

5 Conclusion

In this study, the Fear of Earthquake Scale (FES) developed by Prizmić-Larsen et al. (2023) was adapted to Turkish. The results show that the FES-TR has a one-factor structure with seven items. This structure accounts for 65.8% of the total variance. The results indicate that the FES-TR is a valid and reliable instrument that can be used to assess Turkish people's fear of earthquakes.

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Data availability Data will be made available on request.

Declarations

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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