

Psychometric Properties of Turkish Adaptation of the Environmental Risk Coping Scale

Çevresel Riskle Başa Çıkma Ölçeğinin Türkçeye Uyarlanması ve Psikometrik Özellikleri

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ABSTRACT

Objective: This study aims to adapt Environmental Risk Coping Scale into Turkish and examine its psychometric properties.

Method: For this aim, the psychometric properties of the scale adapted into Turkish were tested in a sample of 230 participants living in 6 cities with high earthquake risk in Türkiye. Participants responded to the Environmental Risk Coping Scale, Environmental Risk Perception Scale, questions on Present Fatalistic and Future Time Orientation, and a demographic information form (i.e., age, gender, education level, city of residence, and homeowner/renter status, past earthquake experience, extent of earthquake damage).

Results: The findings of the analyses (i.e., confirmatory factor analysis, reliability analysis) showed that this 12-item scale is reliable and valid in the Turkish sample. Specifically, desirable fit indices ($\chi^2 / sd = 2.06, p < .001, CFI = .96, TLI = .95, RMSEA = .07, 90 \% CI [.05, .09], SRMR = .04$) demonstrated that the confirmatory factor analysis confirmed the two-factor structure (problem focused and emotion focused coping strategies) and Cronbach α values (.89 for 9-item problem focused coping strategies factor and .72 for 3-item emotion focused coping strategies factor) indicate that the internal consistency of the scale is high. In addition, the sub-dimensions of the Turkish version of the scale were correlated with variables such as risk perception, present-fatalistic time orientation, future time orientation, and demographic factors such as age, earthquake experience, and the extent of damage in earthquake(s) in line with the literature.

Conclusion: The Turkish adaptation of the Coping with Environmental Risk Scale was found to be a reliable and valid scale in the Turkish sample.

Keywords: Environmental risk, earthquake risk, environmental risk coping, problem-focused coping strategies

ÖZ

Amaç: Bu çalışma, Çevresel Riskle Başa Çıkma Ölçeğini Türkçeye uyarlamayı ve psikometrik özelliklerini incelemeyi amaçlamaktadır.

Yöntem: Bu amaçla Türkçeye uyarlanan ölçeğin psikometrik özellikleri Türkiye'deki deprem riski yüksek olan 6 şehirde yaşayan 230 kişilik bir örneklem ile test edilmiştir. Katılımcılar, Çevresel Riskle Başa Çıkma Ölçeğini, Çevresel Risk Algısı Ölçeğini, şimdiki kaderci ve gelecek zaman yönelimi ile ilgili soruları ve demografik bilgi formunu (yaş, cinsiyet, eğitim düzeyi, yaşanılan şehir ve ev sahibi/kiracı olma durumu, geçmiş deprem deneyimi, depremden alınan hasarın boyutu) cevaplamışlardır.

Bulgular: Yapılan analizlerin (doğrulayıcı faktör analizi, güvenilirlik analizi) bulguları 12 maddelik bu ölçeğin Türkiye örneğinde güvenilir ve geçerli olduğuna işaret etmektedir. Spesifik olarak, istenilir düzeyde olan uyum indeksleri ($\chi^2 / sd = 2.06, p < .001, CFI = .96, TLI = .95, RMSEA = .07, 90 \% CI [.05, .09], SRMR = .04$) doğrulayıcı faktör analizinin iki faktörlü (problem odaklı ve duygu odaklı başa çıkma stratejileri) yapıyı doğruladığını, Cronbach α değerleri (9 maddeli problem odaklı başa çıkma stratejileri alt boyutu için .89, 3 maddeli duygu odaklı başa çıkma stratejileri alt boyutu için .72) de ölçeğin iç tutarlılığının yüksek olduğunu göstermektedir. Buna ek olarak, ölçeğin Türkçe versiyonunun alt boyutları risk algısı, şimdiki-kaderci zaman yönelimi, gelecek zaman yönelimi gibi ilişkili olabilecek değişkenlerle ve yaş, deprem deneyimi, deprem(ler)de alınan hasarın boyutu gibi demografik faktörlerle literatürle paralel ilişkileri saptanmıştır.

Sonuç: Çevresel Riskle Başa Çıkma Ölçeğinin Türkçe uyarlamasının Türkiye örneğinde güvenilir ve geçerli bir ölçek olduğu saptanmıştır.

Anahtar sözcükler: Çevresel risk, deprem riski, çevresel riskle başa çıkma, problem odaklı başa çıkma stratejileri

Introduction

Türkiye has experienced various natural disasters throughout its history due to its geographical location and geological structure. Its rugged structure can trigger landslides, and its different climatic zones can simultaneously trigger fires in hot regions such as the Mediterranean and Aegean, and floods in the Black Sea region. Among these natural disasters, earthquakes are the most frequent and cause the most damage. In Türkiye, which lies on the Mediterranean, Alpine-Himalayan seismic belts, three main fracture systems (North, South and West) make 93% of the country an earthquake zone (TMMOB 2012). As shown in previous studies (Bahrainy and Bakhtiar 2022), density of settlement on active fault lines increases the loss of life and property in earthquakes.

In the 7.4 magnitude 1999 Marmara earthquake, one of the largest earthquakes in Türkiye 's history, 17408 people lost their lives and a total of 376479 houses and workplaces were damaged. On February 6, 2023, 14 million people in 11 provinces were affected by the Kahramanmaraş centered earthquakes. The Minister of Interior announced that 50783 citizens lost their lives, and 107204 citizens were injured in these earthquakes (Internet Haber 2023). In the aftermath of the disaster, the region experienced serious problems in terms of shelter and health needs, and economic and social life completely disrupted, forcing many earthquake victims to move to other cities. On the other hand, studies (Parsons 2004, Kundak and Türkoğlu 2007) indicated that the earthquake risk in Istanbul is also high and that a number of factors (e.g., unplanned settlement, population and building density, age of buildings) may increase the severity of the disaster.

Risk, which is defined as "the possibility of something bad happening at some time in the future" (Oxford Learner's Dictionaries 2021) and "the danger of being harmed" (TDK 2021), refers to anything that has the possibility of harming people. While the explanations made by experts working in the field based on scientific studies can be gathered under the concept of risk assessment, risk perception refers to individuals' subjective evaluations of these possible negative situations (Bonaiuto et al. 2016). Risk perception is closely related to individuals' feelings that they will be affected by risk (e.g., fear), whether the risk is controllable, and beliefs about the imminence of possible consequences of risk (Slovic et al. 1981). However, experts' assessments of risk and individuals' perceptions of risk often do not align (Bonnes et al. 2007). Therefore, it is necessary to understand individuals' perceptions of risk in order to minimize the negative consequences of a possible disaster (Subiza-Perez et al. 2020).

Individuals are under the threat of experiencing destructive experiences such as earthquakes throughout their lives and have developed various psychological strategies to cope with them. Individuals' strategies to protect themselves from danger are associated with both cognitive and emotional mechanisms (Navarro et al. 2020). Risk coping strategies, which can be defined as "the behaviours and actions that people adopt when facing a risky situation" (Bonaiuto et al. 2016), are discussed in two categories by researchers. Individuals who frequently use the emotion-focused coping strategy aim to passively regulate anxious (e.g., fear) emotions related to the risk. They try to avoid experiencing negative emotions by thinking that the situation is not very serious, crying or making jokes that minimize the risk. Problem-focused coping strategies, on the other hand, include more proactive attitudes and behaviors in terms of being prepared for the risk, such as the desire to have information about the risk, seeking support from experts and authorities, and moving from the risk area to a safer area (Lazarus and Launier 1978, Lopez-Vazquez and Marvan 2004). In other words, problem-focused coping strategies refer to a general state of alertness to danger, while emotion-focused coping strategies refer to an orientation to avoid unwanted emotions (Homburg et al. 2007).

Individuals' attitudes towards natural disasters vary and these attitudes are shaped by various factors. Several studies examining the relationship between risk perception and risk coping in relation to various socio-demographic variables (Greenberg and Schneider 1995, Lindell and Perry 2000, Armaş 2006) indicated that women have a higher risk perception than men. Gustafson (1998) indicated that men have a higher risk perception of physical violence and occupational accidents, while women have a higher risk perception of infectious diseases and environmental disasters. Lindell and colleagues (2016) also found that women are more prepared for earthquakes than men. In previous studies investigating the relationship between age and preparedness for environmental risk, it has been found that individuals become more prepared for risk as they get older (Bodas et al. 2019) and that middle-aged individuals have a higher level of risk preparedness than young people (Tekeli-Yeşil et al. 2010). In addition to age and gender, previous studies have found that home ownership can also motivate individuals to prepare for possible future earthquakes (Karancı et al. 2005, Spittal et al. 2008, Joffe et al. 2013, Joffe et al. 2019).

The experience of disaster also shapes the risk perception and coping strategies of individuals. Studies show that damage and loss in previous disasters strengthen individuals' risk perception of future disasters, and this awareness leads to disaster preparedness (Jackson 1981, Lindell and Perry 2000). Earthquake experience involves several components such as the number of earthquakes the person has experienced before, and the losses experienced by him/her and his/her relatives in previous earthquakes. In addition, direct exposure to earthquakes can cause emotional, physical, and economic damages (Nguyen et al. 2006). Studies have found that people who live in high-risk areas and who have previously experienced natural disasters directly or indirectly are more inclined to prepare for earthquake risk (Heller et al. 2005). Moreover, earthquake experience has been found to be associated with individuals perceiving possible future earthquakes as riskier (Kung and Chen 2012), and higher risk perception has been associated with greater disaster preparedness (Lindell and Hwang 2008). On the contrary, individuals who rarely experience natural disasters think that they have little control over the disaster and are reluctant to engage in activities that will make them less vulnerable to earthquakes (Winter and Fried 2000).

Another variable that may be related to coping with environmental risk is the fatalistic perspective. Low sense of control over natural disasters leads to fatalistic beliefs in the face of disasters (Asgarizadeh Lamjiry and Gifford 2021). Specifically, individuals with a fatalistic perspective think that nothing can be done in the face of natural disasters such as earthquakes and floods and attribute the cause of disasters to fate, bad luck, or a divine power (Sun et al., 2022). Previous studies have also found that fatalistic perspective has a negative relationship with earthquake preparedness (Solberg et al. 2010, Baytiyeh and Naja 2016).

Studies conducted in Türkiye have also yielded findings parallel to the international literature. In a report prepared by the Disaster and Emergency Management Authority (AFAD 2014), nearly half of the participants stated that they think there is a disaster risk in their region and earthquake is the most expected disaster type. On the other hand, 26.1% of the participants indicated that they were completely unprepared for a possible disaster, while 43.6% stated that they did not make any preparations. The rate of those who prepared for an earthquake is only 10%. In another study (Tekeli-Yeşil et al. 2011), which examined the risk perception of people living in İstanbul regarding earthquakes, it was observed that women, individuals with low or middle socioeconomic status and participants with low education level perceived more risks for themselves and their families.

There are several measures in Turkish that may be related to coping with environmental risk (Yöndem and Eren 2008, İnal et al. 2018, Şentuna and Çakı 2020, Türkdöğün Görgün et al. 2023). The scale developed by İnal and colleagues (2018) includes self-efficacy (sample item: "I can do basic first aid"), cues to action (sample item: "My friends enlighten me about the necessity of making individual preparations for emergency situations/disasters"), perceived susceptibility (sample item: "I take into consideration that I may experience an emergency situation/a disaster at some point in my life"), perceived barriers (sample item: "I find it difficult to understand the family disaster plan"), perceived benefits (sample item: "My making individual preparations for emergency situations/disasters will also save my family members"), and perceived severity (sample item: "The idea of disasters scares me") (İnal et al. 2018); The Psychological Preparedness for Disaster Threat Scale, adapted by Türkdöğün Görgün et al. (2023) and consisting of the factors of knowledge and management of external conditions (sample item: "I know how to adequately prepare my home for the forthcoming natural disaster such as earthquake, flood, forest fire or epidemic/pandemic"), management of one's emotional and psychological reactions (sample item: "I seem to be able to stay cool and calm in most difficult situations") and management of one's social environment (sample item: "If others are in distress, I know how to calm them down"); Disaster Preparedness Scale which is developed by Şentuna and Çakı (2020) and consisting of the subscales of disaster physical protection (sample item: "Did you make insurance for your house against natural disasters?"), disaster planning (sample item: "Did you do any planning inside your family for any disaster?"), disaster assistance (sample item: "Does everyone in your home over 15 years of age know how to turn off electric, water and natural gas?") and disaster warning and signals (sample item: "Does everyone in your family know what warning signals mean?") and Coping with Earthquake Stress Scale, developed by Yöndem and Eren (2008) which includes the sub-dimensions of religious coping (sample item: "I fulfill my religious duties more"), positive re-search (sample item: "I think it would be good to give myself time") and social support (sample item: "I talk to someone who can cope with this problem better") are some of these measurement tools.

There are a few points that distinguish the Environmental Risk Coping Scale, which is the subject of this study, from the aforementioned scales. The concepts tested in these scales (e.g., self-efficacy, perceived barriers, management of emotional and psychological reactions, religious coping) have all been found to be related to earthquake preparedness by various studies. However, the concepts measured by the sub-dimensions and the

concepts in our study do not directly measure the same thing. In addition, they do not directly address coping strategies as active (problem-focused coping) or passive (emotion-focused coping) as in our scale.

Considering these findings in the literature and the fact that coping strategies are not directly conceptualized as problem-focused/emotion-focused in other scales developed or adapted into Turkish, this study aims to conduct validity and reliability analyses of the Turkish version of Environmental Risk Coping Scale (Lopez-Vazquez et al. 2004, Navarro et al. 2020). The psychometric properties of the scale adapted into Turkish were tested in a sample of people living in 6 cities with high earthquake risk in Türkiye.

Method

Procedure and Sample

First, the English version of the Environmental Risk Coping Scale was translated into Turkish by the researchers. In order to check the clarity of the items of the scale, which was adapted according to the earthquake, the opinions of individuals with different educational levels were obtained. After the expert opinion of two researchers from the field of psychology, the scale was finalized.

After obtaining approval (Approval Date: April 14, 2022) from the Middle East Technical University (METU) Human Research Ethics Committee (Protocol Number: 201-ODTÜİAEK-2022), the data collection process started and through convenience sampling, people living in 6 cities with high earthquake risk (Nİstanbul = 69, NBursa = 67, Nİzmir = 41, NKocaeli = 29, NBalıkesir = 10, NYalova = 7) completed the questionnaire form online through Qualtrics (2005) software. The study was announced on various social media platforms and participants were included in the study in this way. Before starting the study, all participants were briefly informed about the study and their voluntary consent was obtained for their participation and it was stated that they could leave the study at any time. Participants were not paid for their participation. After their voluntary consent was obtained, participants completed the questionnaire in an average of 8 minutes. The system prevents multiple participation from the same IP address. Therefore, the same person(s) did not fill out the questionnaire more than once. A total of 230 participants (163 women, 60 men, 7 did not specify their gender; Mage = 31.70, SDage = 10.58) took part in the study. The rule of thumb in scale development and adaptation studies is to have at least 10 participants for each item (Nunnally 1978). Considering the sample size, this study meets this rule. Of the participants, 52.9% (N = 119) were university graduates, 26.7% (N = 60) were master's/doctorate graduates, 13.3% (N = 30) were high school graduates, 6.2% (N = 14) were vocational school graduates, and .9% (N = 2) were primary school graduates. While 53.6% (N = 120) of the participants stated that they were homeowners, 46.4% (N = 104) were renters.

Measures

Environmental Risk Coping

The original language of the scale developed by Lopez-Vazquez and Marván (2004) to understand coping strategies with volcanic eruption risk is Spanish. The scale consists of two dimensions: problem-focused coping strategies (9 items, $\alpha = .79$), which include the willingness to have more information about the risk and what can be done in the face of the risk, and emotion-focused coping strategies (4 items, $\alpha = .76$), which include denial of the risk and not taking it seriously. The scale was adapted into English by Navarro et al. (2020) and the Turkish adaptation was based on the English version. This two-dimensional structure consisting of problem-focused coping strategies ($\alpha = .88$ for flash flooding and $\alpha = .75$ for coastal flooding) and emotion-focused coping strategies ($\alpha = .70$ for flash flooding and $\alpha = .72$ for coastal flooding) was also validated in Navarro et al.'s (2020) study. Participants responded to each item on a scale of (1 = never, 5 = always).

After obtaining the necessary permissions for the adaptation of the scale, the scale items were independently translated into Turkish by the authors and 3 different experts from outside the field of psychology translated this Turkish form back into English. These forms were reviewed by the authors and the scale was finalized.

Environmental Risk Perception

There are 35 items in total in this scale created by Güler (2019) to understand the perception of people living in Düzce against risks related to earthquake, landslide, flood, forest fire and drought. In this study, the 7-item ($\alpha = .89$) earthquake risk perception part of the scale was used (sample item: "Earthquake threatens my or my family's

life safety"). The factor loadings of these 7 items ranged between .68 and .85 and explained 60.53% of the variance. Participants gave responses to each item ranging from (1 = strongly disagree to 5 = strongly agree).

Present-Fatalistic and Future Time Orientation

Participants' perceptions of time were measured with one item from the Zimbardo Time Perspective Inventory. For present fatalistic time orientation, the item "Since whatever will be will be, it doesn't really matter what I do" was used, and for future time orientation, the item "I am able to resist temptations when I know that there is work to be done" was used. The original version of the scale consists of a total of 56 items in 5 subscales (future, present-fatalistic, present hedonistic, past-positive, past-negative) (Zimbardo and Boyd 1999). The two items used in this study were taken from Güler-Edwards' (2008) 25-item Turkish version. In the original form of the Zimbardo Time Perspective Inventory, the internal consistency coefficient (α) of the present fatalistic time orientation sub-dimension was .79, while it was .70 in the adapted version of Güler-Edwards (2005). For future time orientation, the reliability coefficient was .77 in the original form and .66 in the adapted version.

Demographic Information

In this section, respondents were asked questions about their age, gender, level of education, city of residence and homeowner/renter status. They were also asked to indicate whether they had experienced earthquakes before and how much physical damage their houses suffered in these earthquakes.

Statistical Analysis

First, skewness and kurtosis values, and Mahalanobis distances were examined to understand whether the data were normally distributed. Skewness and kurtosis values between -1 and +1 indicate that the univariate normality assumption was met (Hair et al. 2013), while two outliers violating multivariate normality were excluded from the analysis after the calculation of Mahalanobis distance. Then, confirmatory factor analysis was conducted using jamovi to verify whether the scale was bi-dimensional for the current sample. One item ("I reject the idea of the situation being serious") was excluded from the analysis due to its low factor loading (.18). The fit values obtained as a result of confirmatory factor analysis ($\chi^2 / sd = 2.06$, $p < .001$, CFI = .96, TLI = .95, RMSEA = .07, 90 % CI [.05, .09], SRMR = .04) confirmed that the scale was bi-dimensional. After confirming that the scale was bi-dimensional, reliability analysis was conducted to test its internal consistency and the Cronbach α values obtained (.89 for the 9-item problem-focused coping strategies sub-dimension and .72 for the 3-item emotion-focused coping strategies sub-dimension) indicated that the scale was reliable. Finally, in order to test the construct validity of the scale, correlation analysis was conducted to examine its relationship with variables that may be positively and negatively related. In parallel with the previous literature, the correlations of the sub-dimensions of the Turkish version of the scale with potentially related variables such as risk perception, present-fatalistic time orientation, future time orientation, and demographic factors such as age, earthquake experience, and the extent of damage in previous earthquake(s) were observed.

Results

Before examining the factor structure of the scale, a number of analyses were conducted to determine whether the data were normally distributed. Skewness and kurtosis values between -1 and +1 indicate that the univariate normality assumption is met (Hair et al. 2013). In order to understand whether the multivariate normality assumption was met, Mahalanobis distance was calculated, and two outlier values were excluded from the analysis. Descriptive statistics for the items of the adapted scale are presented in Table 1.

Factorial Structure

Confirmatory factor analysis using jamovi was applied to confirm whether the scale was bi-dimensional for the current sample. One item (Item 10: "I reject the idea of the situation being serious") was removed due to its low factor loading (.18). Thus, the problem-focused coping strategies dimension of the Turkish version of the scale consisted of 9 items and the emotion-focused coping strategies dimension consisted of 3 items.

Goodness-of-fit results showed that the model did not fit the data well ($\chi^2 (n = 230, df = 53) = 232$, χ^2/df [relative chi-square index] = 4.38, $p < .001$, comparative fit index (CFI) = .86, Tucker-Lewis index (TLI) = .83, root mean square error of approximation (RMSEA) = .12, 90 % CI [.11, .14], Standardized Root Mean Squared Residual (SRMR) = .09) (for model fit criteria see Bentler 1990). The findings suggested adding error covariance between Item 1 and Item 2, Item 2 and Item 3, and Item 12 and Item 13. Since these items are theoretically similar (see

Figure 1 for items), the analysis was re-run by adding the specified error covariances (Chou and Bentler, 2002). Results showed that this model provided a better fit to the data (χ^2 (n = 230, df = 50) = 103, $\chi^2/df = 2.06$, $p < .001$, CFI = .96, TLI = .95, RMSEA = .07, 90 % CI [.05, .09], SRMR = .04). Standardized parameter loadings for the two-factor model are presented in Figure 1.

Item	Mean	Standard Deviation	Skewness	Kurtosis
"I analyze the circumstances to know what to do"	3.63	.91	-.44	-.11
"I seek information from those who know"	3.61	1.07	-.66	-.08
"I consult with professionals about the problem"	2.63	1.09	.26	-.43
"I modify my surroundings to avoid a disaster"	2.84	1.06	.15	-.36
"I state my objectives and redouble my efforts"	2.87	1.11	.15	-.58
"I participate more in citizen protection activities"	2.31	1.03	.51	-.21
"I meditate on what strategies I can use"	3.28	.95	-.01	-.03
"I have a prevention plan and I follow it"	2.47	1.10	.38	-.38
"I try to change my habits according to the problem"	2.37	1.14	.53	-.40
"I act as if the risk did not exist"	2.08	1.25	.69	-.98
"I try not to think about the problem"	2.76	1.24	.03	-.99
"I try not to feel anything"	2.45	1.22	.35	-.83

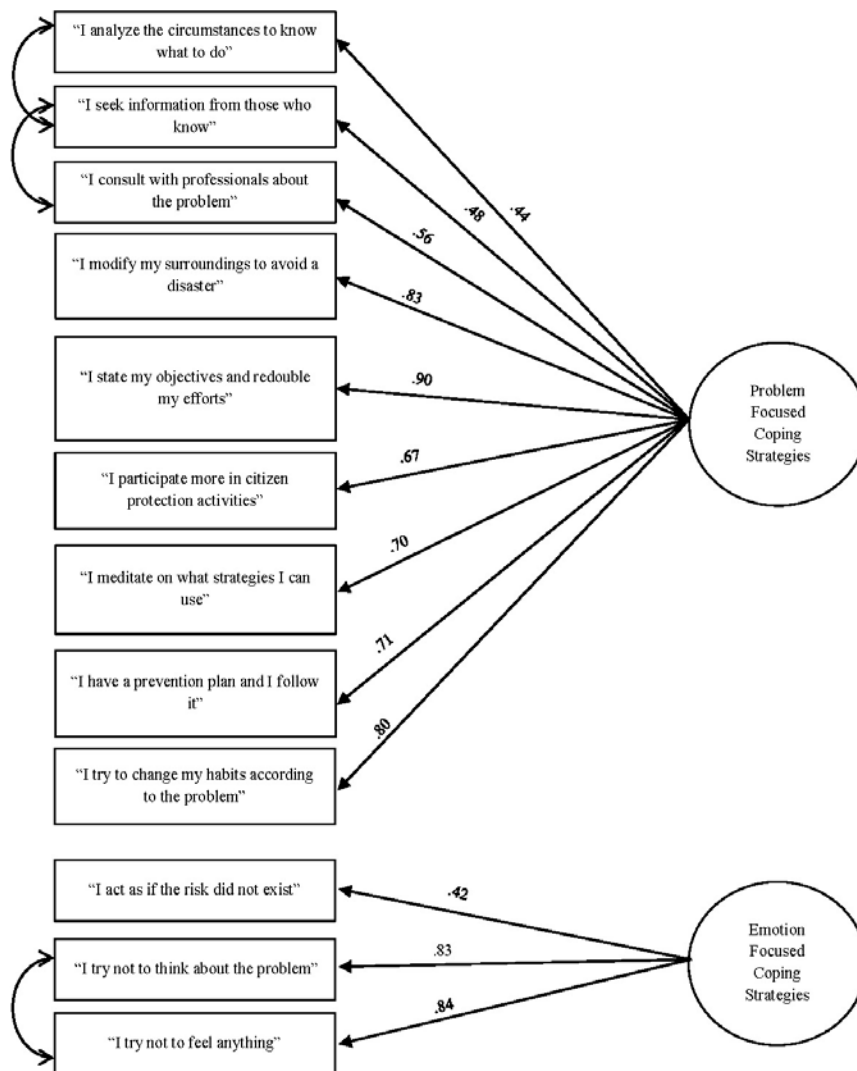


Figure 1. Bi-dimensional structure of Environmental Risk Coping Scale and standardized parameter estimates

Reliability Analysis

After the validation of the two-factor structure of the Environmental Risk Coping Scale, internal consistency coefficients were calculated for the sub-dimensions of problem-focused coping strategies and emotion-focused coping strategies. Internal consistency coefficient (Cronbach's α) was .89 for the first dimension and .72 for the second dimension. These values indicate that the Turkish version of the scale is reliable.

	1	2	3	4	5	6	7	8
1. Problem Focused Coping Strategies	—							
2. Emotion Focused Coping Strategies	-.232***	—						
3. Risk Perception	.245***	-.071	—					
4. Earthquake Experience	.140*	-.065	-.037	—				
5. The Extent of Destruction Caused by Previous Earthquake(s)	.221***	-.089	.114	.003	—			
6. Age	.134*	.048	-.075	.196**	.010	—		
7. Present-Fatalistic Time Orientation	-.022	.136*	-.083	-.065	.044	.187**	—	
8. Future Time Orientation	.294***	.055	.050	.055	.011	.072	-.097	—

* $p < .05$, ** $p < .01$, *** $p < .001$.

Construct Validity

In order to test the construct validity of the scale adapted into Turkish, the relationships between problem-focused and emotion-focused coping strategies and variables that may be positively or negatively related to them were examined. In parallel with previous studies (e.g., Burger and Palmer 1992, Lindell and Perry 2000, Bodas et al. 2019), earthquake risk perception ($r = .245$, $p < .001$), future time orientation ($r = .294$, $p < .001$), past earthquake experiences ($r = .140$, $p = .04$), magnitude of damage received in past earthquake(s) ($r = .221$, $p < .001$), and age of the participant ($r = .134$, $p = .045$) were positively correlated with the problem-focused coping strategies sub-dimension of the scale, and present fatalistic time orientation ($r = .136$, $p < .045$) was positively correlated with the emotion-focused coping strategies sub-dimension (Table 2). In addition, an independent samples t-test was conducted to determine whether the scores obtained from the subscales of the scale differed according to gender and home ownership, and no statistically significant difference was found according to gender or home ownership (Table 3 and Table 4).

	Group	Mean	Standard Deviation	p	t
Problem Focused Coping Strategies				.96	.05
	Female	2.90	.78		
	Male	2.90	.70		
Emotion Focused Coping Strategies				.36	.92
	Female	2.47	.99		
	Male	2.33	.97		

$N_{female} = 163$, $N_{male} = 60$.

	Group	Mean	Standard Deviation	p	t
Problem Focused Coping Strategies				.45	.75
	Homeowner	2.94	.79		
	Renter	2.87	.73		
Emotion Focused Coping Strategies				.61	.51
	Homeowner	2.46	.97		
	Renter	2.39	1.02		

$N_{homeowner} = 120$, $N_{renter} = 104$.

Discussion

In the present study, which tested the psychometric properties of the Turkish version of the Environmental Risk Coping Scale (Lopez-Vazquez and Marvan 2004, Navarro et al. 2020), data were collected from 230 participants in 6 different cities with high earthquake risk in Türkiye. The findings of the analyses (i.e., confirmatory factor analysis, reliability analysis) indicate that this 12-item scale is reliable and valid in the Turkish sample. Specifically, satisfactory fit indices (CFI, TLI, RMSEA, SRMR) indicate that the confirmatory factor analysis confirmed the two-factor structure, and Cronbach α values indicate that the internal consistency of the scale is high. In addition, the sub-dimensions of the Turkish version of the scale were correlated with potentially related variables such as risk perception, present-fatalistic time orientation, future time orientation, and demographic factors such as age, earthquake experience, and extent of damage in earthquake(s) in parallel with the literature.

Problem-focused coping strategies, which are shaped by more proactive attitudes and behaviors in the face of risk, such as the willingness to seek information about the risk and the request for support from relevant authorities and experts, were found to be positively related to risk perception. Similar findings were also found in previous studies. For example, high risk perception positively predicted strategies such as moving from the current location (Xu et al. 2019) and making the place of residence safer against earthquakes (Asgarizadeh Lamjiry and Gifford 2021) in order to avoid being harmed by possible future earthquakes.

Individuals with a fatalistic perspective think that good or bad experiences happen beyond their control, and therefore, there is not much that can be done about things that could potentially harm them (e.g., natural disasters). Studies examining the role of fatalism on earthquake preparedness (e.g., Yari et al. 2019, Liu and Sun. 2022) have found that having a fatalistic perspective is a barrier to disaster preparedness. As an example, Sun et al. (2022) found that fatalistic perspective was negatively related to perceived self-efficacy in earthquake risk reduction in a Chinese sample. In parallel with these findings, fatalistic time orientation in the present study showed a positive relationship with emotion-focused coping strategies such as ignoring the earthquake risk and trying not to feel anything in the face of this risk. Future time orientation was positively associated with problem-focused coping strategies.

The problem-focused coping strategies subscale of the scale is positively associated with earthquake experience and the extent of damage sustained in the past earthquake(s). A similar pattern was found in previous studies (Lindell and Perry 2000, Winter and Fried 2000, Oral et al. 2015). For example, previous research (Nguyen et al. 2006; Perry and Lindell 2008) suggests that natural disaster experience may facilitate preparedness for subsequent earthquakes through physical (e.g., injury), psychological, or economic (e.g., home damage) effects. On the contrary, people who are infrequently exposed to natural disasters perceive their level of control over the disaster as low and show reluctance to engage in activities that would make them less affected by the earthquake (Winter and Fried 2000).

Previous studies (Tekeli-Yeşil et al. 2010, Bodas et al. 2019) have demonstrated that age is positively associated with earthquake preparedness. Similarly, in our study, it was observed that problem-focused coping strategies increased with increasing age. However, it was found that the scores obtained from the sub-dimensions of the scale did not differ according to gender and home ownership. Although these findings of the study are not consistent with most of the previous studies, there are also studies showing that gender (Nguyen et al., 2006) and homeownership (Asgarizadeh Lamjiry and Gifford 2021) are not related to earthquake preparedness.

Some limitations should be taken into consideration when evaluating the findings of this study. First, although the sample of the study did not consist of university students, unlike most psychology studies, the relatively low average age ($M_{age} = 31.70$) constitutes an obstacle to the generalization of the findings especially for older individuals. In addition, most of the participants (71%) were female. Therefore, it is suggested that future research should both examine environmental risk coping strategies in older individuals and take gender balance into consideration. In addition, the sample of this study consisted of participants residing in İstanbul, Bursa, İzmir, Kocaeli, Balıkesir, and Yalova, which have high earthquake risk. Although these cities have experienced major earthquakes in the past, many cities, especially in Eastern Anatolia and Southeastern Anatolia, are also at risk of earthquakes. For this reason, this scale should also be applied to individuals in other cities with high earthquake risk. Another limitation of our study is that the test-retest reliability of the scale was not tested. Although test-retesting involves various limitations (e.g., the possibility that the responses in the first administration may be remembered and affect the responses in the second administration, participants becoming more familiar with the test procedure) (see, e.g., Röseler et al. 2020), not measuring test-retest reliability is another limitation of this study. Despite these limitations, our study is important in terms of

introducing the Environmental Risk Coping Scale into Turkish and has a significant potential to encourage future academic studies to address the limitations identified in the current study.

Conclusion

In this study, the Turkish version of the Environmental Risk Coping Scale was adapted, and the analyses showed that the two-factor structure was confirmed in the Turkish sample. Both the findings of this study and the previous literature suggest that individuals' preparedness for environmental risks and actively coping with these risks can play an important role in reducing physical, psychological, and economic damages in the face of natural disasters. Especially in regions with high disaster risk, individuals' ability to determine what they can do in the face of disasters and to have a more active rather than fatalistic and passive attitude towards disasters may increase social resilience in the face of possible disasters. Moreover, the clarity of environmental risk-related messages and the credibility of the source can make information about risks more effective and help individuals to take a more active stance on risks. Specifically, clear and unambiguous risk-related messages from authorities (e.g., government officials, scientists) can help individuals to be better prepared for and more actively engage with risks by raising awareness about environmental risks and promoting a better understanding of the seriousness of risks; better knowledge of the causes and consequences of risk; and more effective collaboration among relevant stakeholders (e.g., individuals, neighborhood communities, government officials) (Maidl and Buchecker 2015, Abunyewah et al. 2017).

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Addendum 1. Turkish Version of Environmental Risk Coping Scale

Environmental Risk Coping Scale (Turkish Version)

Research shows that there are more earthquakes in some regions of Turkey. Individuals living in these regions may exhibit various behaviors against a possible earthquake in the future. Some examples of these behaviors are given below.

Please indicate how often you exhibit each of these behaviors using the options ranging from “Never” to “Always”.

	Hiçbir Zaman	Nadiren	Bazen	Sık Sık	Her Zaman
1. Ne yapacağımı bilmek için koşulları analiz ederim.	1	2	3	4	5
2. Bilgi sahibi kişilerden bilgi toplamaya çalışırım.	1	2	3	4	5
3. Deprem hakkında uzmanlara danışırım.	1	2	3	4	5
4. Depremden kaçınmak/ depremde zarar görmemek için çevremde değişiklikler yaparım.	1	2	3	4	5
5. Depreme karşı yapabileceklerimi belirlerim ve bunları gerçekleştirebilmek adına daha çok çabalarım.	1	2	3	4	5
6. Depreme karşı kendimin ve diğer insanların güvenliğini sağlamak adına yapılan aktivitelere katılırım.	1	2	3	4	5
7. Deprem öncesinde, sırasında ve sonrasında yapabileceklerim üzerine düşünürüm.	1	2	3	4	5
8. Deprem esnasında uygulayabileceğim bir müdahale planım var ve bu planım üzerine çalışırım.	1	2	3	4	5
9. Deprem riskiyle daha iyi baş edebilmek adına alışkanlıklarımı değiştirmeye çalışırım.	1	2	3	4	5
10. Deprem ciddi bir risk olduğu fikrini reddederim.*	1	2	3	4	5
11. Deprem riski yokmuş gibi hareket ederim.	1	2	3	4	5
12. Deprem hakkında düşünmemeye çalışırım.	1	2	3	4	5
13. Deprem hakkında herhangi bir şey hissetmemeye çalışırım.	1	2	3	4	5

Note: Item 10 was removed from the scale due to its low factor loading (.18).

Scoring

Problem-Oriented Coping Strategies (Items 1,2,3,4,5,6,7,8,9)

Emotion-Focused Coping Strategies (Items 11,12,13)