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Psychometric validation of the Turkish Short form of the disaster resilience scale for individuals

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ABSTRACT

Purpose: This study adapts and validates the Short Form of the Disaster Resilience Scale for Individuals (DRSi-SF) into Turkish, aiming to provide a practical tool for assessing disaster preparedness in high-risk contexts.
Method: Data were collected from 505 adults across Türkiye, a country highly exposed to earthquakes, floods, and landslides. The DRSi-SF was translated and back-translated, with linguistic equivalence confirmed via paired t-tests and correlations. Psychometric analyses included exploratory and confirmatory factor analyses, internal consistency, concurrent validity testing with the Disaster Risk Perception Scale, and measurement invariance across gender and disaster experience groups.
Findings and Conclusion: The Turkish DRSi-SF retained its original three-factor structure—knowledge, readiness, and action—with acceptable fit indices (CFI = 0.906, RMSEA = 0.074) and reliability (α = 0.71). Disaster resilience correlated positively with risk perception, supporting concurrent validity. Measurement invariance was established at configural, metric, and scalar levels across groups, enabling meaningful subgroup comparisons.
Practical implications: The DRSi-SF offers a brief, scalable instrument for policymakers, emergency agencies, and NGOs to identify resilience levels, inform preparedness strategies, and target interventions. Its brevity facilitates integration into e-government systems, mobile applications, and community-based screenings.
Originality: This is the first Turkish adaptation of the DRSi-SF, aligning with the Sendai Framework for Disaster Risk Reduction and providing a culturally relevant, psychometrically sound tool applicable to other hazard-prone regions.

1. Introduction

Türkiye is among the countries most exposed to natural hazards, with a large proportion of its population and critical infrastructure located in earthquake-prone areas (Edemen et al., 2023; Şahin & Sipahioğlu, 2003). The widespread prevalence of multiple hazards across the country underscores the critical importance of individual-level disaster resilience (Ministry of Interior of the Republic of, 2022; Fig. 1). In recent years, the increasing frequency and intensity of disasters have resulted in substantial human and economic losses, highlighting the urgent need to strengthen disaster risk reduction capacities (EM-DAT, 2025). These figures highlight that in disaster-prone countries such as Türkiye, both individual and societal resilience are fundamental for mitigating—and where possible preventing—disaster impacts (Botzen & Van Den Bergh, 2009).

Disaster resilience refers to the capacity of societies, systems, and individuals to prepare for, absorb, recover from, and adapt to adverse events while maintaining essential functions (Cutter et al., 2014; Manyena et al., 2011; United Nations Office for Disaster Risk, 2017). Given that individuals often provide the initial response during disasters before professionals arrive at the scene, individual disaster resilience constitutes a foundational component of broader societal resilience by directly influencing collective vulnerability and adaptive capacity (Bonati, 2016). Strengthening cognitive and behavioral capacities—such as disaster-related knowledge, readiness behaviors, and effective action—plays a key role in fostering disaster-resilient communities (Jiang, 2012; Matsukawa et al., 2024). Within this framework, one of the significant contributors to individual disaster resilience is the perception of disaster risk. Disaster risk perception refers to how individuals interpret, evaluate, and internalize potential hazards and their

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consequences (Pazzi et al., 2020). Previous studies indicate that higher levels of risk perception are associated with increased readiness behaviors and proactive engagement in disaster risk reduction activities, regardless of prior disaster experience (Odiase et al., 2020; Saifudin, 2023; Zhixing et al., 2022). These findings suggest that individual resilience can be strengthened not only through experience but also through education and awareness, underscoring the importance of reliable and valid measurement tools.

Evidence from disaster-prone countries such as Japan further demonstrates the role of early disaster education in strengthening individual disaster resilience (Doğru & Coşkun, 2023; Torisu, 2021).

The Disaster Resilience Scale for Individuals (DRSi) was originally developed with 24 items across eight factors. In the same study, the authors also introduced a short form of the scale consisting of 8 items and three factors (Matsukawa et al., 2024). Due to their user-friendliness and brevity, short forms facilitate data collection processes and encourage voluntary participation while maintaining the psychometric integrity of the original instruments (Widaman et al., 2011). Short-form instruments are particularly valuable in disaster research, as they reduce respondent burden, facilitate large-scale data collection, and enhance applicability in time-sensitive or field-based contexts (Smith et al., 2000; Stanton et al., 2002).

A review of the literature reveals that the short form of the DRSi has not yet been adapted into any language or cultural context, including Turkish. Consequently, there is a lack of evidence regarding its validity and reliability across diverse linguistic and cultural settings. Accordingly, this study aims to adapt and validate the Turkish version of the Disaster Resilience Scale for Individuals–Short Form (DRSi-SF) and to examine its psychometric properties, including construct validity, reliability, concurrent validity, and measurement invariance.

2. Method

2.1. Scale translation and adaptation

The translation of the DRSi items followed the back-translation method proposed by Brislin (1970). Initially, permission was obtained from Shingo Nagamatsu, the corresponding author of the original scale development team. Subsequently, three experts proficient in both English and Turkish translated the scale items independently. These three versions were then reviewed comparatively by an academic expert in disaster management, and a finalized Turkish version was prepared. This Turkish version was then back-translated into English by a linguist who is fluent in English and works as an academic at a higher education institution that provides instruction in a foreign language. The back-translated form was submitted to the original scale development team, specifically to Shingo Nagamatsu, to assess semantic equivalence. The author confirmed that the original and translated forms were equivalent in meaning and that the adaptation was valid and appropriate for the intended purpose. Based on this confirmation, the linguistic validity of the Turkish version was considered to be achieved. To further strengthen the linguistic equivalence, a second verification step was conducted. The original English version of the DRSi was administered to a group of 21 individuals with appropriate qualifications, including English language graduates employed in the public or private sector, and undergraduate students currently studying in English language departments. After one week, the Turkish version of the scale was sent to the same participants. To assess the equivalence of the two forms, correlation analysis and a paired samples *t*-test were conducted. The results showed a correlation of 0.723 between the English and Turkish versions, and the *t*-test revealed no significant difference ($p > 0.05$), indicating that there was no meaningful discrepancy between the two forms and that the translation process was appropriately conducted. Additionally, participants were informed that consecutive identical responses across all items might lead to their exclusion from the analysis, to ensure data quality and response attentiveness.

2.2. Design and sample of study

This study employed a cross-sectional quantitative design to adapt and validate the Disaster Resilience Scale for Individuals (DRSi) into Turkish. Data collection was conducted in June 2025 using an online survey platform to reach participants from various regions across Türkiye. The target population consisted of Turkish-speaking individuals aged 18 years and above residing in Türkiye. Although probability sampling is ideal for generalizability, due to time and logistical constraints, a non-probability convenience sampling strategy was employed (Cohen et al., 2002). Nevertheless, efforts were made to ensure diversity in terms of age, gender, and geographic distribution to enhance representativeness.

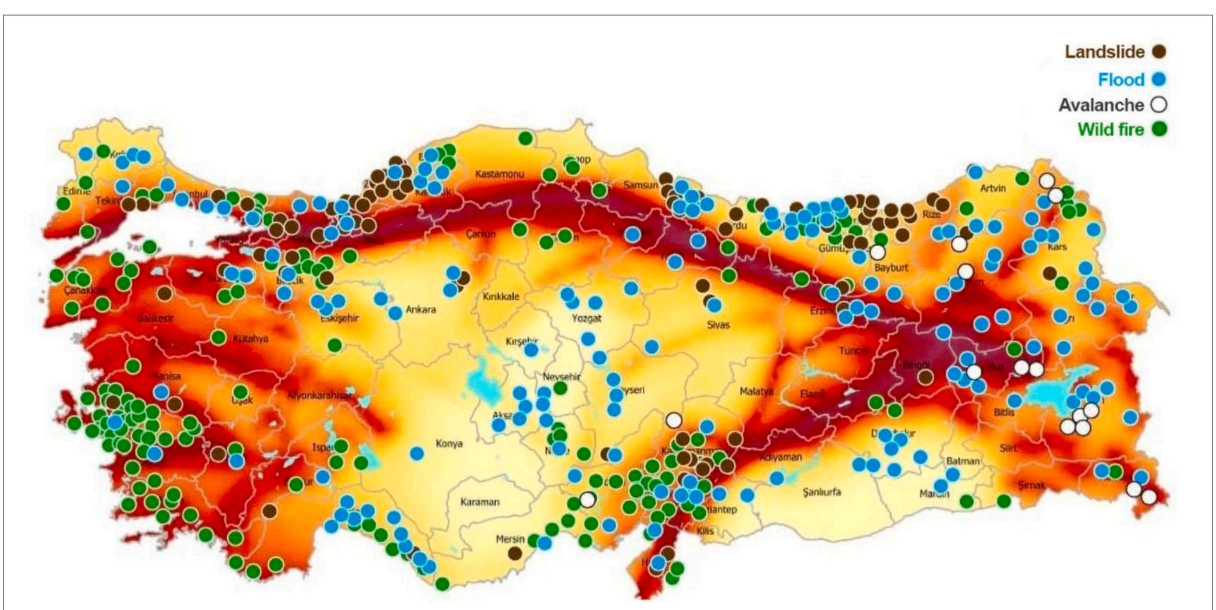

Fig. 1. Türkiye Disaster Risk Map (Ministry of Interior of the Republic of, 2022). Note: Areas with earthquake hazard are indicated in red on the map. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

2.3. Measures

2.3.1. Short form of the disaster resilience scale for individuals (DRSi-SF)

The DRSi-SF consists of three factors and eight items. It is a 5-point Likert-type scale ranging from "Strongly disagree (1)" to "Strongly agree (5)." The total score ranges from 0 to 40, with higher scores indicating higher levels of individual disaster resilience (Matsukawa et al., 2024). The short form was designed to provide a concise and practical assessment of individual disaster resilience in large-scale and field-based research contexts.

2.3.2. Disaster risk perception scale (DRPS)

The Disaster Risk Perception Scale (DRPS), developed by Kiymis & Kaya (2025), consists of 25 items across five subdimensions and uses a 5-point Likert-type response format ranging from 'strongly disagree (1)' to 'strongly agree (5).' Total scores range from 0 to 125, with higher scores indicating greater perceived disaster risk. The DRPS was included in the present study to examine concurrent validity.

2.4. Data collection procedure

A researcher-developed questionnaire was used to collect information on participants' age, gender, education level, income status, occupation, and region of residence. Additional questions addressed disaster-related issues, including perceived risks associated with the place of residence, prior disaster experience, participation in disaster-related training programs, knowledge of appropriate behaviors during disasters, and involvement in volunteer activities through governmental or non-governmental organizations. The final survey was administered online via Google Forms and distributed to participants across Türkiye through institutional email networks and widely used digital communication platforms. Data collection was conducted over four weeks. Participation was entirely voluntary, and no forced responses were required. Following this process, the measurement instruments were transferred into digital format.

2.5. Data analysis

The data were analyzed using the SPSS 25.0 and AMOS 23.0 statistical software packages. A 95% confidence interval was adopted, and statistical significance was set at $p < 0.05$. Prior to the main analyses, the dataset was screened for missing values, outliers, and normality assumptions. Cases with excessive missing data or identical response patterns across all items were excluded to ensure data quality. Descriptive statistics were calculated to summarize participants' demographic characteristics. Internal consistency reliability of the DRSi-SF was assessed using Cronbach's alpha and composite reliability coefficients. Prior to confirmatory factor analysis, an exploratory factor analysis (EFA) was conducted to examine the underlying factor structure of the scale. Principal Component Analysis (PCA) was employed as the factor extraction method, and Oblimin rotation with Kaiser normalization was applied, given the theoretical assumption that the factors may be correlated. A factor loading threshold of 0.45 was adopted as the minimum criterion for item retention, in line with commonly accepted recommendations in scale adaptation studies (Costello & Osborne, 2005; Tabachnick et al., 2019). Construct validity was examined through confirmatory factor analysis (CFA) using the maximum likelihood estimation method. Model fit was evaluated based on multiple fit indices, including the chi-square statistic (χ^2/df), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), following commonly accepted cutoff criteria. Concurrent validity was examined by calculating Pearson correlation coefficients between the DRSi-SF total scores and the Disaster Risk Perception Scale (DRPS) scores. In addition, the measurement invariance of the DRSi-SF was tested across selected grouping variables using multi-group confirmatory factor analysis (MG-CFA). Configural, metric, and scalar invariance models were evaluated sequentially, and changes in model fit indices, particularly ΔCFI, were used to assess invariance across groups.

Ethical approval

This study was conducted in accordance with the principles of scientific research and publication ethics and was approved by the Gümüşhane University Research Ethics Committee (Approval Date: 28.05.2025, Decision No: E-95674917–108.99–332862). Participation in the study was entirely voluntary. All participants were informed that they could withdraw from the study at any stage without consequence, that their responses would be kept strictly confidential, and that the data would be used solely for academic and research purposes.

3. Result

Table 1 presents the demographic characteristics of the 505 participants included in this study. The sample consisted of 246 females and 259 males. Data were collected online via Google Forms. Participants were between the ages of 18 and 65, with a mean age of 33.13 years. In terms of educational attainment, 341 participants (67.5%) held an associate or undergraduate degree, while 96 (19.0%) had completed

Table 1
Demographic characteristics of the respondents.

Demographic characteristics		N	%
Gender	Female	246	48,7
	Male	259	51,3
Age	18—25	176	34,9
	26—35	146	28,9
	36—50	142	28,12
	51 and over	37	11,38
Education Level	Primary School	22	4,4
	High School	46	9,1
	Associate/ Bachelor's Degree	341	67,5
	Master's/Doctorate	67	19,0
Marital Status	Married	241	47,7
	Single	264	52,3
Occupation	Not Working	18	3,6
	Retired	23	4,6
	Housewife	21	4,2
	Public Sector	215	42,6
	Student	162	32,1
	Private Sector	66	13,1
Monthly Income	₺0 – ₺15.000 (Very Low)	155	30,7
	₺15.001 – ₺30.000 (Low)	68	13,5
	₺30.001 – ₺45.000 (Medium)	72	14,3
	₺45.001 – ₺75.000 (Good)	173	34,3
	₺75.001 ve üzeri (Very Good)	37	7,3
Place of Residence	District	119	23,6
	Village	43	8,5
	City/Metropolitan	343	67,9
Does your residence have compulsory earthquake insurance (DASK)?	I don't know	137	27,1
	Yes	240	47,5
	No	128	25,3
Are you aware of disaster risks in your area?	Yes	341	67,5
	No	49	9,7
	Partially	115	22,8
Have you ever been exposed to any disaster before?	Yes	298	59,0
	No	207	41,0
Have you received any training related to disasters such as earthquake, flood, landslide, etc.?	Yes	294	58,2
	No	211	41,8
Do you know the correct behaviors during disasters?	Yes	274	54,3
	No	29	5,7
	Partially	202	40,0
Are you a disaster volunteer at AFAD or any NGO?	Yes	107	21,2
	No	398	78,8

postgraduate education. Regarding marital status, 264 participants (52.3%) identified as single. When examining occupational distribution, 215 participants (42.6%) were public sector employees, and 162 (32.1%) were students. In terms of perceived income level, 173 individuals (34.3%) reported having a good income, whereas 155 (30.7%) described their income as very low. A total of 240 participants (47.5%) reported that their residence was covered by disaster insurance. The majority of respondents, 343 individuals (67.9%), resided in metropolitan or urban centers. Furthermore, 341 participants (67.5%) reported being aware of disaster risks in their region; 298 (59.0%) had previously experienced a disaster; and 294 (58.2%) had received disaster-related training. In addition, 274 participants (54.3%) indicated that they were knowledgeable about appropriate behaviors during disasters. However, 398 participants (78.8%) reported that they were not currently volunteering for any organization or institution involved in disaster response or preparedness.

3.1. Exploratory and confirmatory factor analysis

Before conducting the exploratory factor analysis, the suitability of the data was examined. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was calculated as 0.727, which exceeds the acceptable threshold of 0.60 (Kaiser, 1974). Additionally, Bartlett's Test of Sphericity was statistically significant ($p < 0.001$), demonstrating that the correlation matrix was appropriate for factor extraction. Based on these findings, an exploratory factor analysis (EFA) was conducted.

The analysis revealed three factors with eigenvalues greater than 1. The factor loadings of the items ranged from 0.484 to 0.833, while the eigenvalues of the factors varied between 1.064 and 2.417. The variance explained by each factor ranged from 13.30% to 30.21%, with a total explained variance of 59.11%. A total variance explained exceeding 50% is considered an acceptable threshold for the adequacy of exploratory factor analysis (Beavers et al., 2013). To test whether the scale retained its original factor structure, a three-factor model was tested using Confirmatory Factor Analysis (CFA). As shown in Fig. 2, the χ^2/df ratio was below 5, and the RMSEA value was under 0.08, indicating acceptable model fit. Furthermore, the fit indices were as follows: NFI = 0.879, CFI = 0.906, GFI = 0.971, and AGFI = 0.936. These results suggest that the model demonstrated a good overall fit with the data. The high GFI, AGFI, and CFI values, in particular, support the structural validity of the model. Although the NFI value was slightly below the recommended threshold of 0.90, the model can still be considered valid when evaluated alongside the other indices (De Vaus & De Vaus, 2013).

Based on the results of the confirmatory factor analysis, a multi-group confirmatory factor analysis (MG-CFA) was conducted to examine whether the factor structure of the scale operated equivalently across different groups. The analysis focused on three grouping variables: gender, disaster experience, and age. The findings are presented in the Table 2. Measurement invariance was established at the configural, metric, and scalar levels, indicating that the model was structurally comparable across gender and disaster experience groups. Across all stages, the CFI values were around 0.90, and RMSEA values remained below 0.06, reflecting an overall acceptable model fit. At the strict invariance level, slight deviations were observed ($\Delta CFI = 0.013$ for gender; $\Delta CFI = 0.022$ for disaster experience). Although these values exceed the commonly recommended threshold of $\Delta CFI < 0.01$, the literature suggests that strict invariance is not always necessary, and achieving metric and scalar invariance is sufficient to justify meaningful group comparisons (Cheung & Rensvold, 2002; Milfont & Fischer, 2010; Vandenberg & Lance, 2000). In addition to gender and disaster experience, measurement invariance was also tested across three age groups (18–25, 26–35, and 36 +). While the configural model (unconstrained) demonstrated acceptable fit indices (CFI = 0.908, RMSEA = 0.074), metric invariance was not established. The comparison between the

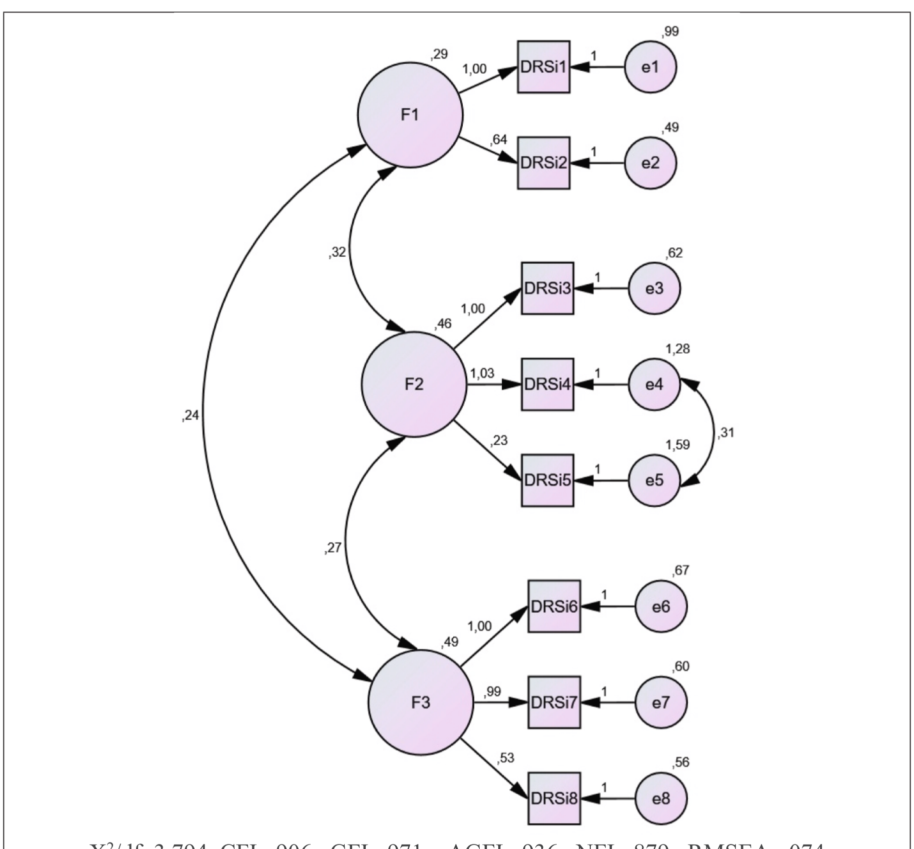

Fig. 2. Path Diagram of the Confirmatory Factor Analysis (CFA).

Table 2
Results of Multi-Group Confirmatory Factor Analysis for Measurement Invariance by Gender, Disaster Exposure, and Age.

Grouping Variable / Stage	χ2(df)	CFI	ΔCFI	RMSEA	Result
Gender (Female vs. Male)					
Configural	81.784 (32)	0.897	—	0.056	Accepted
Metric	87.054 (37)	0.896	0.001	0.052	Supported
Scalar	91.771 (43)	0.899	−0.003	0.047	Supported
Strict	106.980 (52)	0.886	0.013	0.046	Partial Inv.
Disaster Experience (Yes vs. No)					
Configural	76.721 (32)	0.902	—	0.053	Accepted
Metric	83.000 (37)	0.900	0.002	0.050	Supported
Scalar	84.755 (43)	0.909	−0.009	0.044	Supported
Strict	103.894 (52)	0.887	0.022	0.045	Partial Inv.
Age Groups (18–25, 26–35, 36 +)					
Configural	60.706 (16)	0.908	—	0.074	Accepted
Metric	85.168 (26)	0.877	0.031	—	Not Supported
Scalar	—	—	—	—	—
Strict	—	—	—	—	—

Note. χ^2 = chi-square; df = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation. ΔCFI values greater than 0.01 indicate lack of measurement invariance. For age groups, metric invariance was not established (ΔCFI = 0.031); therefore, scalar and strict invariance were not tested.

unconstrained model and the measurement weights model revealed a significant decrease in model fit (ΔCFI = 0.031), which exceeds the recommended threshold of 0.01. This finding indicates that the factor loadings of the DRSi-SF items function differently across age groups, suggesting that younger and older adults may prioritize or conceptualize disaster resilience components in distinct ways.

The selection of grouping variables was guided by theoretical considerations. Gender is a fundamental demographic variable that can influence risk perception and coping strategies (Bonati, 2016; Cutter et al., 2014). Disaster experience directly affects individuals' perceived resilience and behavioral responses (Odiase et al., 2020). Finally, age was included as a variable given that life experience and generational differences may lead to variations in how readiness or action-oriented items are perceived.

3.2. Analyses

Before conducting Confirmatory Factor Analysis (CFA), correlation, and reliability analyses in the scale adaptation process, the suitability of the dataset for factor analysis was examined. Accordingly, outlier detection and removal procedures were performed. Based on the analysis results, 39 participants with extreme values were identified, and their data were excluded from the dataset. Subsequently, Mahalanobis distance values were assessed. Cases with chi-square values below $p < 0.001$ were considered outliers, and six additional participants were removed from the dataset (Tabachnick & Fidell, 2015). Following these procedures, the analysis continued with a total of 505 valid cases.

In cross-cultural scale adaptation, various criteria exist regarding the ideal sample size required for factor analysis. One widely accepted rule suggests that the sample size should be at least ten times the number of items in the scale (Nunnally, 1978). Since 46 items were administered in this study, this criterion was satisfied. Additionally, Comrey and Lee (2013) propose a qualitative sample size evaluation scale: 100 as poor, 200 as fair, 300 as good, 500 as very good, and 1000 as excellent. Based on this criterion, the current study's sample size can be classified as very good.

After removing outliers and securing the sample size, both univariate and multivariate normality assumptions were evaluated. For univariate normality, criteria suggested by Can (2018) were used, including the proximity of the mode, median, and mean values, and the Q-Q plot forming an approximately 45-degree angle with the horizontal axis. Additionally, skewness and kurtosis values were examined according to Hair et al. (2006), who recommend values between + 1.5 and −1.5. The two scales examined in this study met Can's (2018) criteria with closely aligned mean, median, and mode values, and Q-Q plots showing approximately 45-degree angles. Skewness and kurtosis values also fell within the acceptable range indicated by Hair et al. (2006) (for individual disaster resilience: skewness = 0.037, kurtosis = -0.100; for disaster risk perception: skewness = -0.325, kurtosis = 0.225).

Following the confirmation of univariate normality assumptions, multivariate normality was assessed. The scatterplot of the dataset exhibited an elliptical shape, which is indicative of multivariate normality (Tabachnick & Fidell, 2015).

After confirming that the assumptions of normality were met, the relationship between the Disaster Resilience Scale for Individuals and the Disaster Risk Perception Scale was examined. This relationship was analyzed using Pearson's product-moment correlation coefficient, allowing for an assessment of the convergent validity between the two scales. Confirmatory factor analysis (CFA) was conducted to test the appropriateness of the three-factor, eight-item structure for the Turkish version. Based on the original three-factor structure of the scale, a model was tested from this perspective, and the analyses were performed using the Maximum Likelihood (ML) estimation method. This study aimed to adapt the Disaster Resilience Scale for Individuals Short Form (DRSi-SF) into Turkish and to evaluate its psychometric properties. The findings demonstrated that the scale preserved its original three-factor structure knowledge, readiness, and action. ML is frequently preferred for its practicality and comprehensive output (Schumacker & Beyerlein, 2000). Accordingly, the CFA procedure was conducted using ML estimation with AMOS software. The CFA results showed that the chi-square/degrees of freedom ratio (χ^2/df) and the Root Mean Square Error of Approximation (RMSEA) were at the borderline of acceptable ranges reported in the literature. Consequently, covariance terms were introduced between items to improve model fit.

4. Discussion

Although the literature generally recommends conducting exploratory and confirmatory factor analyses on independent samples, several methodological studies indicate that performing both analyses on a single dataset can yield valid and interpretable results when the sample size is sufficiently large (MacCallum et al., 1999). In the present study, the use of a single sample for both EFA and CFA was justified by the relatively large sample size (N = 505), which meets commonly accepted criteria for robust factor analytic procedures. Therefore, the findings related to the factor structure of the Turkish version of the DRSi-SF can be considered methodologically sound.

This study aimed to adapt the Disaster Resilience Scale for Individuals Short Form (DRSi-SF) into Turkish and to evaluate its psychometric properties. The findings demonstrated that the scale preserved its original three-factor structure (knowledge, readiness, and action). Based on the results of the confirmatory factor analysis (CFA), the model demonstrated acceptable fit indices (CFI = 0.906, RMSEA = 0.074), and the internal consistency was supported with a Cronbach's alpha of 0.71. These findings confirm the structural validity of the Turkish version. Furthermore, concurrent validity was supported by a positive correlation with the Disaster Risk Perception Scale, aligning with previous literature that suggests risk perception is associated with behaviors that support individual resilience (Ekşi, 2020; Odiase et al., 2020). Consequently, the findings indicate that the Turkish version of the DRSi-SF is a valid and reliable tool for assessing individual disaster resilience in the context of Türkiye. The adapted scale was found to be consistent with the original version developed by Matsukawa et al. (2024), which was also applied to a Japanese sample. Similarities in model fit indices and factor loadings suggest that the measurement instrument retains its structural equivalence across different cultures. Consistent with the original study by Matsukawa et al. (2024), the 'Action' dimension in the Turkish version encompasses not only physical evacuation behaviors but also psychological adaptability, as reflected in Item 8 ('I can accept that the appearance of my neighborhood…'). The original authors conceptualize this item under the 'ability to adapt to changes after a disaster' sub-factor, positing that psychological acceptance is a fundamental component of taking effective action during the recovery phase. Furthermore, the 'Readiness' dimension (Items 3, 4, 5) effectively consolidates tangible preparations—such as stockpiling and financial insurance—with social planning, aligning with the original scale's emphasis on 'practice disaster readiness'. Moreover, multi-group confirmatory factor analysis (MG-CFA) demonstrated structural, metric, and scalar invariance across gender and disaster exposure groups, supporting valid group comparisons (Cheung & Rensvold, 2002; Milfont & Fischer, 2010). These findings represent a key contribution of this study. Although measurement invariance was established at the configural, metric, and scalar levels across gender and disaster experience groups, metric invariance was not supported across age groups. This finding suggests that certain DRSi-SF items may be interpreted or weighted differently by younger and older individuals. Such age-related differences are not uncommon in resilience and preparedness research, as life experience, generational context, and prior exposure to risk may shape how disaster-related knowledge, readiness, and action-oriented behaviors are conceptualized. Importantly, the absence of metric invariance across age groups does not undermine the overall validity of the scale; rather, it indicates that caution is warranted when conducting direct comparisons of latent factor scores between age cohorts. From a practical perspective, the DRSi-SF remains a valid and reliable instrument for assessing individual disaster resilience within age groups and for identifying general resilience patterns in diverse populations. Similar challenges in achieving full measurement invariance across age have been reported in previous psychometric adaptation studies, underscoring the importance of contextual and demographic sensitivity in resilience measurement (Cheung & Rensvold, 2002; Milfont & Fischer, 2010). Additionally, the results show that the scale measures disaster resilience consistently, regardless of participants' gender or prior disaster exposure, confirming its applicability across diverse populations in Türkiye. The Turkish short form of the DRSi offers a practical, time-efficient, and psychometrically robust tool for assessing individual disaster resilience.

This instrument can assist local governments and municipalities in identifying levels of individual disaster resilience within specific neighborhoods, rural areas, and villages. It can thereby guide the design of targeted educational initiatives and interventions aimed at enhancing community preparedness and transformation. Owing to its brevity, the tool can be integrated into e-government platforms, the AFAD system, NGO mobile applications, educational institutions, and distance learning platforms, enabling broad-based individual and societal resilience assessments and informing policy development. Moreover, the instrument can facilitate the identification of vulnerable groups and regions, providing a foundation for integrated strategies with local authorities. By identifying populations with low resilience, high risk, or disadvantage, targeted awareness and preparedness programs can be implemented before disasters, and these regions can be prioritized for emergency response during and after disaster events. Ultimately, this contributes to reducing loss of life and property. The inclusion of an item querying participants' status as disaster volunteers aims to capture socio-cultural behaviors, location knowledge, and community embeddedness, which are known to enhance social resilience during disaster events (Steffen & Fothergill, 2009). Volunteering fosters individual resilience and contributes to community-level disaster resilience by reducing vulnerability and supporting response and recovery efforts through augmenting human resource capacity for professional teams (Daddoust et al., 2021; Ganoe et al., 2023). Disaster volunteers, possessing local knowledge and cultural familiarity, can significantly enhance community resilience during and after disaster events (Steffen & Fothergill, 2009). Therefore, integrating the scale into volunteer recruitment and training programs may empower individuals and strengthen disaster preparedness capacities. In this study, the Turkish version of the DRSi-SF was examined for construct validity, reliability, and measurement invariance, yielding acceptable psychometric outcomes (CFI = 0.906, RMSEA = 0.074, Cronbach's alpha = 0.71). Compared to widely used resilience scales in the literature, these findings offer both structural and practical contributions. For example, the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) conceptualizes psychological resilience through a five-factor structure: personal competence and tenacity, trust in one's instincts and the strengthening effect of stress, positive acceptance of change and secure relationships, control, and spiritual influence. The original studies reported high internal consistency ($\alpha = 0.89$). Unlike the present study, however, the CD-RISC does not specifically address dimensions related to disaster management or disaster resilience, such as readiness, knowledge, and action. Similarly, another resilience measure the Brief Resilience Scale (BRS) does not focus on disaster-related situations (Smith et al., 2008). Instead, it presents a unidimensional tool that emphasizes the individual's capacity and speed of recovery from stress. Smith et al. conceptualize resilience in this scale not as a set of traits but as the ability to bounce back following adversity. Although not explicitly labeled a resilience scale, the Disaster Preparedness Evaluation Tool (DPET) is another instrument in the literature that aims to assess disaster preparedness (Tichy, 2009). The DPET evaluates nurses' knowledge, intervention skills, and personal awareness before, during, and after disasters. Compared to our study, however, the DPET has a narrower sample focus (limited to nurses), and its length may lead to lower participant motivation due to the large number of items. In contrast, the brevity of the DRSi-SF and its practical focus on disaster volunteerism and individual awareness offer significant advantages over these instruments. Its validated structural validity and measurement invariance also support its use in comparative analyses across diverse demographic groups. Furthermore, the adapted version of the DRSi-SF addresses three theoretically and practically grounded components of disaster resilience knowledge, readiness, and action reflecting behaviors and attitudes relevant to high-risk settings. While other instruments (such as CD-RISC, BRS, and DPET) serve broader psychological or preparedness-related purposes, the DRSi-SF is more directly aligned with community-based disaster risk reduction efforts. It supports global frameworks such as the Sendai Framework for Disaster Risk Reduction (UNDRR), enhancing its relevance and utility in both research and policy contexts (United Nations Office for Disaster Risk, 2017).

This focus enhances its applicability within Türkiye's hazard-prone contexts, including public health, emergency education, and disaster management sectors. Despite promising psychometric outcomes, some limitations warrant consideration. First, data collection relied on online self-report surveys using convenience sampling, potentially limiting sample representativeness. Second, the cross-sectional design precluded assessment of temporal stability, and test–retest reliability was not measured. Third, although measurement invariance was tested for gender and disaster experience, regional and cultural differences within Türkiye were not addressed. These limitations should be tackled in future research. Future studies could overcome these limitations by testing the scale's validity and reliability in larger and more diverse samples. Longitudinal designs would enable monitoring of changes in individuals' disaster resilience over time. Research involving rural populations, older adults, or culturally diverse participants could further enhance the scale's generalizability. Additionally, examining relationships between disaster resilience and psychological constructs such as coping strategies, social capital, or post-traumatic growth may deepen understanding of resilience processes. Finally, adapting the scale across different languages and cultural contexts would facilitate international comparisons and contribute to global disaster resilience measurement strategies.

4.1. Limitations of the study

Despite the methodological strengths of this study, several limitations warrant consideration. First, data collection was conducted via online self-report surveys using convenience sampling, which may constrain the generalizability of the results. Second, the study utilized a cross-sectional design, and the test–retest reliability of the scale was not evaluated. Third, strict measurement invariance was not fully established across gender and disaster exposure groups, suggesting the possibility of differential item functioning. Furthermore, regional cultural variations within Türkiye were not examined, leaving the scale's applicability across diverse sociocultural subpopulations unexplored. Future research should employ longitudinal designs, incorporate larger and more heterogeneous samples, and investigate the scale's relationships with other psychological constructs to enhance its validity and practical utility.

5. Conclusion

This study successfully adapted the Disaster Resilience Scale for Individuals – Short Form (DRSi-SF) into Turkish and demonstrated that the scale retains its original three-factor structure, establishing it as a psychometrically valid and reliable instrument. This represents the first Turkish adaptation of the Individual Disaster Resilience Scale. The dimensions of knowledge, readiness, and action consistently explained individual disaster resilience. The scale's significant association with risk perception indicates that individual resilience levels align with disaster preparedness. Thanks to its concise 8-item format, the DRSi-SF offers practical applicability in disaster management, community preparedness, and volunteer coordination. It can be effectively utilized by local governments, non-governmental organizations, and policymakers to identify individual vulnerabilities and support risk reduction and response planning. Furthermore, integration into mobile applications or online platforms could facilitate rapid screening of resilience levels across broad populations. Future research is recommended to examine the scale's validity across diverse cultural and socio-demographic groups, test its longitudinal stability, and explore its relationships with post-disaster recovery, psychological resilience, and related constructs. Overall, the DRSi-SF is expected to contribute meaningfully to building disaster-prepared societies.

CRediT authorship contribution statement

Salih Doğru: Writing – review & editing, Writing – original draft, Validation, Methodology, Conceptualization.

Declaration of competing interest

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

Annex 1

Disaster Resilience Scale for Individuals.

Item	Please indicate the extent to which you agree with the following statements	Stronglydisagree	Disagree	Neither agreenor disagree	Agree	Stronglyagree
	Based on the hazard map, I can tell where the danger areas are in case of a disaster.(Bir afet durumunda, tehlike veya risk haritalarına bakarak tehlikeli alanların nereler olduğunu anlayabilirim.)	1	2	3	4	5
	Pre-disaster social solidarity efforts will contribute to the recovery process after the disaster.(Afet öncesi dönemde toplumsal dayanışmanın güçlendirilmesi, afet sonrası iyileşme sürecine katkı sağlar.)	1	2	3	4	5
	I discuss what to do in the event of a disaster with my family and acquaintances(Bir afet olması durumunda ne yapılması gerektiğini ailemle ve yakın çevremle konuşurum.)	1	2	3	4	5
	I usually stockpile drinking water and emergency food for disaster times.(Afet zamanları için içme suyu ve acil durum gıdası stoklarım.)	1	2	3	4	5
	The disaster insurance I have, or support I might receive from family or civil society organizations, could be sufficient for me to rebuild my life after a disaster.(Sahip olduğum afet sigortası veya aile ya da sivil toplumdan alabileceğim destekler, bir afet sonrası hayatımı yeniden kurmam için yeterli olabilir.)	1	2	3	4	5
	I can take immediate action to save lives in the event of a disaster.(Afet sırasında hayat kurtarmaya yönelik hemen harekete geçebilirim.)	1	2	3	4	5
	I take on various tasks while staying in temporary shelters.(Afet sonrası zamanlarda geçici barınma alanında kalırsam çeşitli görevler üstlenmekten kaçınmam.)	1	2	3	4	5
	I can accept that the appearance of my neighborhood or town may change after a disaster. (Bir afet sonrası mahalle veya şehir görünümünün değişebileceğini kabul ediyorum.)	1	2	3	4	5

1,2; Knowledge 3,4,5; Readiness 6,7,8;Action

Data availability

Data will be made available on request.

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