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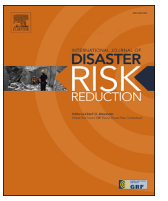

Validity and reliability study of charity hazard scale

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ABSTRACT

Safety culture, which enables people to think proactively, is a concept that is still developing in Turkey. From a disaster management point of view, the concept of safety culture provides the formation of a culture covering the implementation of the risk management phase. Therefore, it is possible to state that the concept of charity hazard poses a serious threat to the safety culture. Thus, the concept of charity hazard is of great importance in the formation of safety culture in the fields of occupational health and safety, emergency aid and disaster management. In this context, the present study aims to develop a valid and reliable scale for the concept of charity hazard. As a result of the analyses conducted with 532 participants residing in different cities across Turkey and working in different fields; the factor loadings of the items in the scale ranged between 0.51 and 0.95 and the total variance explained was calculated as 63.244 %. According to the results of the confirmatory factor analysis, the charity hazard scale consists of 3 factors and 10 items ($X^2/df = 2.346$, RMSEA: 0.050, SRMR: 0.048, NFI: 0.97, NNFI: 0.97, CFI: 0.98, GFI: 0.97, AGFI: 0.95). The internal consistency of the scale was calculated as 0.758 and item-total correlations ranged between 0.318 and 0.554. In conclusion, the analyses show that the charity hazard scale developed is a valid and reliable measurement tool.

1. Introduction

The integrated disaster management system consists of two parts that follow each other in the form of a cycle, namely the risk management phase applied before the disaster and the crisis management phase applied after the disaster. The risk management phase is the phase in which the efforts to prevent the hazard in question or to reduce the damage to be exposed to are implemented before the disaster occurs [53]. The risk management phase consists of two main titles: risk mitigation and preparation. In addition to risk mitigation and preparation stages in the risk management phase, forecasting and early warning systems are also a part of the integrated disaster management system. The crisis management phase to be implemented after the disaster consists of two main titles as intervention and improvement. In addition, impact and needs analyses and reconstruction activities to be implemented during the risk management phase are another part of the integrated disaster management system [1–3].

Risk management is the first step in reducing vulnerability to these hazards [54]. With the correct implementation of the risk management phase in the integrated disaster management system, not only the loss of life can be prevented but also economic gains can be achieved. With the risk management phase applied, the damages of the disaster to be exposed to can be reduced by the measures

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taken before the disaster occurs. Instead of ten units of expenditure after the disaster, an amount of less than ten units of expenditure during the risk management phase may help to reduce both economic damage and loss of life [4–6]. It is possible to state that the concept of charity hazard emerged precisely at this stage. In the disaster management system, the concept of charity hazard appears as a problem of the risk management phase. In the study, the development of charity hazard in the literature is presented in general. Then, the place of charity hazard in disaster management was tried to be determined. After a comprehensive literature research, studies were initiated to develop a scale with the charity hazard data obtained.

There are various studies on the concept of charity hazard in the literature. Although the theoretical justifications for the charity hazard have been put forward by various theoretical studies [7–10], different results have been obtained as a result of empirical studies [11–18]. Studies show that charity hazard yields different results in different countries against different types of disasters. In addition, no study has been conducted to measure the awareness of charity hazard. It is aimed to fill an important gap in the literature by proving the validity and reliability of the charity hazard scale developed with the present study. It is thought that the scientific and cultural contributions of the study to be conducted will be important since it is the first measurement tool to be developed about charity hazard. When it is evaluated within the framework of economic contribution to the states; it is considered that it will be of great benefit in terms of reducing the loss of life after disasters, the expenditures made and the unplanned damages of disasters on state economies.

Although the concept of charity hazard has been used in various studies in different types of disasters, there is no study in the literature on the measurement of the concept. For this reason, the main purpose of the study is to develop a charity hazard scale with proven validity and reliability. By making charity hazard a measurable concept, a big step will be taken in the scope of risk management for states by including primarily households, companies, public institutions and cities. Thanks to the measures to be put into practice by measuring the low awareness of charity hazard, both the loss of life can be reduced and financial gains can be achieved.

In the study, the "three phases and nine steps of scale development and validation" procedure recommended by Ref. [19]; which is very common and accepted by the authorities, was planned and implemented to develop valid and reliable charity hazard scale. The first phase, item development: (1) identification of the domain(s) and item generation, and (2) consideration of content validity. The second phase, scale development, i.e., turning individual items into a harmonious and measuring construct, consists of (3) pre-testing questions, (4) sampling and survey administration, (5) item reduction, and (6) extraction of latent factors. The last phase, scale evaluation, requires: (7) tests of dimensionality, (8) tests of reliability, and (9) tests of validity [19].

In the context of the structure of this research, the following section presents the concept of charity hazard, the theoretical background of the concept and the purpose of the research. In the third section, the methodology of the research is explained under the subheadings of population of the study, ethical approval, data collection tool, data analysis. The fourth section presents the results of the study. The fifth section includes discussion, the sixth section consists of conclusion, and the seventh section addresses implications.

2. Background

The concept of charity hazard emerged when people considered state aid after floods as an alternative to insurance systems used for risk transfer [11]. Insurance is a risk transfer method [20]. Insurances, which are generally used for disasters, are used in the risk management phase in order to minimise disaster losses. The fact that the state guarantees financial aid after a disaster makes people less incentivised to use insurance against disaster risks [10,21,22].

The phenomenon underlying the concept of charity hazard is that when people know that they will receive aid after the disasters, they do not make the necessary preparations by making expenditures within the scope of risk management. The fact that people who have a dilemma about charity hazard know that aid organisations and/or the state will help them after the disaster they will be exposed to, causes the measures to be implemented by spending economically in the risk management phase to be ignored. In a 2002 study, a theoretical analysis shows that people do not take out natural disaster insurance because governments provide millions of euros in aid to their citizens after flood disasters in Europe [10]. In a study where the opposite result was obtained, it was revealed that there was a positive relationship between the expectation of aid from the state after disasters and flood insurance purchase [17]. In a study on storm, which is a different type of disaster, it was found that there was no relationship between the expectation of disaster aid and the decision to use storm insurance [18]. A study conducted on people living in Germany revealed that homeowners and tenants exhibit different behaviours towards disasters in the face of the expectation of financial state aid in case of floods [23].

Recent studies have revealed the relationship between disaster insurance and charity hazard. A study conducted in Italy on flood risk perception and the use of flood insurance within the scope of risk transfer showed that the expectation of financial aid from the state due to charity hazard did not take preventive measures against flood risk [24]. Again, in a study conducted in New York related to the flood disaster, it was revealed that the risk mitigation decisions of homeowners residing in flood-prone areas and their expectations for federal disaster aid were negatively correlated [25].

In a study conducted in Turkey on Charity Hazard, the possibility that people who expect the state to provide aid after natural disasters do not invest sufficiently within the scope of disaster measures was also mentioned. It is stated that this dilemma of charity hazard will both impose a huge financial burden on the public sector and lead to a decrease in social welfare due to the inefficient use of resources [47]. A study of German property owners analysing the flood prevention strategies of those exposed to flooding as a natural disaster and those not exposed to flooding as a natural disaster revealed that in flood-prone areas, charity hazard is experienced as an alternative to insurance use behaviour [26].

In a study on the impact of natural disasters on cultural heritage, the impact of strategic use of insurance on risk management is assessed and the proactive role of some factors, including charity hazard, is revealed [27]. Modelling was carried out with the data ob-

tained in a study examining whether the concept of charity hazard exists in the Italian agricultural insurance system. In this study, which empirically investigates the determinants of the spreading of agricultural insurance policies, the existence of charity hazard is revealed [28]. In a study examining the use of flood insurance by surveying households in the USA, it was concluded that coastal households were 25–42% less likely to have insurance. The study concluded that 817,000 uninsured homes could cause an annual loss of $526 million to the National Flood Insurance Fund as a result of the charity hazard [29]. In a study on flood resilience in Germany, it was found that the concepts of adverse selection, moral hazard and charity hazard limit the use of flood insurance, which should be implemented in the risk management phase [30].

When the concept of charity hazard associated with disasters is considered together with the concept of safety culture, it gains great importance to turn it into a measurable concept. Although safety culture is a concept that evaluates the safety of employees in the workplace and their approaches to emergencies, it is mostly used in risk assessment studies in the oil industry, maritime (Rundmo, 1996) and construction sectors (Xia et al., 2017). In a study investigating the disaster preparedness beliefs of teachers in Turkey, misperceptions and beliefs such as people's inability to defend themselves against disasters are put forward as “perceived barriers” to safety culture (Sönmez and Gökmenoğlu, 2023).

Earthquakes are one of the natural disasters that threaten the safety of people, can spread over a wide area of influence and have destructive power [31–33]. The largest earthquakes in Turkey in terms of impact area and financial aspects were the 17 August Marmara and 12 November Düzce earthquakes in 1999. As in all other disasters, these earthquakes had great impacts on infrastructure services, manufacturing, agriculture, tourism, health, education and economic sectors. Government expenditure for earthquake damages was 1% of GNP (US$ 1774 million) in 1999 and 1.7% (US$ 5.570 million) in 2000 [49]. Apart from these, US$ 3 billion in aid was provided by the World Bank on condition that services such as emergency aid, relief, reconstruction, improvement of the insurance system and establishment of building inspection rules are provided after the earthquake [34]. When considered worldwide, it is seen that disasters caused by climate change cause trillions of US dollars of damage [35,52].

Since Turkey is located in an earthquake zone as well as various disasters, the importance of the charity hazard scale for Turkey increases. Therefore, it is of great importance to develop the charity hazard scale in Turkey. In 1999, the August 17 Gölcük earthquake caused serious damages. In the following years, earthquakes, storms, landslides, floods, mining accidents, and various industrial accidents occurred and caused great financial losses [36]. Turkey experiences an average of 8 natural and man-made disasters per year. According to the Emergency Events Database, these disasters result in an average of 1043 deaths and 2937 injuries per year [37]. The most recent earthquake in Turkey was reported by the Presidency of the Republic of Turkey's Presidency of the Republic of Turkey's Strategy and Budget Directorate, which published casualty and damage assessment reports [55]. On February 6, 2023, two earthquakes with magnitudes of Mw7.7 and Mw7.6 occurred in Pazarcık and Elbistan districts of Kahramanmaraş province in Turkey. Similarly, on February 20, 2023, another earthquake with a magnitude of Mw6.4 occurred in Yayladagi district of Hatay province. These earthquakes caused massive destruction in 11 provinces. In total, more than 48,000 people lost their lives, more than half a million buildings were damaged, communication and energy infrastructure was damaged and significant material losses were incurred. The total population of the 11 affected provinces was recorded as 14, 013, 196 people, representing approximately 16.4 % of the country's population. The majority of this population lives in provincial and district centers, while the rest reside in towns and villages. In addition, 1,738,035 people in the earthquake zone are migrants under temporary protection. The report also provides information on post-earthquake housing damage and relief costs. According to the data provided in the report, the estimated damage for houses that will be immediately demolished, severely damaged or destroyed is 822.9 billion TL and for houses with moderate damage is 209 billion TL. The total housing damage was estimated at 1031.9 billion TL (54.7 billion dollars). In addition, the number of heavily damaged, immediately demolished and destroyed barns in the earthquake zone is reported to be 14,314 and the number of commercial establishments in the same category is 94,217. The total damage to barns and commercial establishments is estimated at 42 billion TL (2.2 billion USD). In the aftermath of the Kahramanmaraş earthquakes, it was decided to provide TL 10,000 in cash aid to households whose houses were damaged. The total cost of this assistance is estimated to be 19.3 billion TL. In addition, it is planned to provide relocation assistance and rent assistance to households whose houses are destroyed, urgently demolished, heavily damaged and moderately damaged. The estimated cost of the aids to be provided in this context is estimated to be 33 billion TL. An estimated expenditure of 25 billion TL is envisaged for the purchase of tents, tent materials and containers for the temporary shelter of earthquake victims. In addition, an estimated 40.5 billion TL is expected to be spent for accommodation and food expenses of earthquake victims.

2.1. Aim of the study

In this study, a valid and reliable charity hazard scale was developed to measure the awareness of charity hazard in Turkey.

3. Method

In this study, to develop a valid and reliable charity hazard scale “three phases and nine steps of scale development and validation” procedure recommended by Ref. [19]; was implemented. Table 1 shows mentioned phases and steps.

This study adhered to the recommended “three phases and nine steps of scale development and validation” procedure outlined by Ref. [19] in the development of a valid and reliable charity hazard scale. The initial two steps, encompassing the item development phase, involved the meticulous identification of the domain and item generation, with a focus on selecting the most pertinent items for assessment (step 1) and ensuring that these items effectively measured the domain of interest through content validity assessment (step 2). The subsequent four steps comprised the scale development phase, where pre-testing questions (step 3) was conducted to ascertain the meaningfulness of the questionnaire items, followed by survey administration and determination of an appropriate sample size (step 4) to gather data from the targeted population. Steps 5 and 6, involving item reduction and the extraction of factors, respec-

Table 1
Three phases and nine steps of scale development and validation.

Phases	No	Steps
Item development	1	Identification of the domain and item generation
	2	Content validity
Scale development	3	Pre-testing of questions
	4	Sampling and survey administration
	5	Item reduction
	6	Extractions of factors
Scale evaluation	7	Tests of dimensionality
	8	Test of reliability
	9	Test of validity

tively, ensured the scale's parsimony and delved into latent constructs within the observed data. Finally, the scale evaluation phase encompassed steps 7 to 9, where the tests of dimensionality (step 7) examined the congruence of latent constructs with initial hypotheses, tests of reliability (step 8) assessed the consistency of responses upon repetition, and tests of validity (step 9) confirmed that the scale effectively measured the intended latent dimension, thereby establishing the scale's validity and reliability in evaluating charity hazards comprehensively. This rigorous procedure ensures the development of a scientifically sound and dependable tool for assessing risks and hazards within the realm of charitable activities [19].

3.1. Population and sample of the study

The study was conducted with the participation of individuals working in different institutions and organisations across Turkey who have taken at least one academic course in occupational health and safety and/or disaster management during their education. The survey was conducted through online platforms. While some sources suggest 10 times of items [50] for sample size in scale development studies, some sources suggest 20 times of items [38]. Since the scale used in the current study consists of 20 items, it is planned to carry out a survey study with 400 participants. In the survey study, which started to be conducted after obtaining ethical permission, the participants were informed that they could voluntarily complete the online survey until the end of the specified period. The first participants were asked to help reach participants with similar qualifications and the sample was reached by snowball sampling method. At the end of the aforementioned period, 532 individuals participated in the study. Considering the sample size reached, it was also observed that the volume was higher than the expected sample size. Finally, since all questions in the measurement tool used in the study were compulsory to be answered, the analyses were carried out on the responses of all 532 participants.

3.2. Ethical approval

Ethical approval for the study was obtained from the Institute of Science and Technology Directorate, Marmara University, Turkey on October 21, 2022 (E–44174047-302.10.01–388,113).

3.3. Data collection tool

The data collection tool used in the study consists of two parts. In the first section, there are 5 items questioning the demographical characteristics such as gender, age, marital status, educational status, and professional experience of the participants. In the second part, the charity hazard scale, which is aimed to be developed and consists of 20 items, is included (e.g. I believe that the financial aid provided by the state after disasters is political). In the evaluation of the scale, a 5-point Likert-type evaluation was used (1: Strongly Disagree, 2: Disagree, 3: Neither Agree nor Disagree, 4: Agree, 5: Strongly Agree).

A four-stage process was followed in the design of the scale. In the first stage, since the first use of the concept of "*charity hazard*" by Browne and Hoyt in 2000 in their book "The Demand for Flood Insurance; Empirical Evidence", all 424 domestic and foreign academic works published on the concept have been analysed. All the different data on charity hazard in the studies examined are listed chronologically. When all of the studies were analysed in order to remove the scale items, it was seen that the same items were put forward in some studies. The obtained data were re-examined and the similar ones were separated and then turned into potential survey questions. Thus, a framework consisting of 81 items of the concept, which is the subject of the present study, was created. In the second stage, interviews were conducted with two different qualitative techniques with these survey questions obtained by following the scale development steps.

In the first study, in-depth interviews were conducted with individuals. Face-to-face and online interviews were conducted with six people from the target group of the study between 13 and 14 October 2022. The face-to-face interview with the first person, a Class A occupational safety specialist and an academician working in the field of occupational health and safety, lasted 33 min 9 suggestions were received under different headings (e.g. demographic questions should be asked before the survey questions and more than one option should be marked in some of the questions) and the interview was concluded. The online interview with the second person working as a nurse in a university hospital lasted 36 min 5 suggestions were received under different headings (e.g. the need to add the number of children to demographic questions) and the interview was concluded. The online interview with the third person, a Class B occupational safety specialist and architect, lasted 47 min 7 suggestions were received under different headings (e.g. the necessity of state aids with a social state approach) and the interview was concluded. The face-to-face interview with the fourth person, an emergency health services worker and occupational safety technician, lasted 35 min 8 suggestions were received under different headings (e.g. if the word "irresponsibility" is used instead of "avoiding my responsibilities" in items 16, 17 and 18, it will make it eas-

ier to understand) and the interview was concluded positively. The face-to-face interview with the fifth person, a Class A occupational safety specialist, lasted 30 min 11 suggestions were received under different headings (e.g. health insurance should be added to the insurance options used) and the interview was concluded. The interview conducted online with the sixth and last person of the first focus interviews, a Class B occupational safety specialist and academician, lasted 41 min 11 suggestions were received under different headings (e.g. a different concept should be used instead of "guaranteed aid" in question 9) and the interview was concluded. The data obtained from 6 different people in the first focus interviews were reported in detail one by one.

In the second stage, the focus group study was conducted with five different people at the same time through online interviews. The five people in the focus study conducted as a group consisted of two Class B Occupational Safety Specialists actively working in the field, two academicians working in the field of public health who have worked in AFAD (Disaster and Emergency Presidency) in the past, and one academician in the Civil Defence and Firefighting department who has also worked in AFAD in the past. The interview, in which suggestions were received under 25 different topics, lasted 2 h and 24 min (e.g. if "state financial aid" is used instead of "state aid", it will be more understandable in terms of charity hazard). The data obtained from the second focus group study were also reported in detail. After the necessary additions, subtractions and corrections were made to the scale items in the light of the information in the reports, a survey consisting of 20 items was created.

In the third stage of the scale development design, the ethics committee approvals required for the survey study were obtained from Marmara University Institute of Science and Technology Directorate, Turkey. The survey developed for the scale development study was communicated to the target groups through different communication channels. In the fourth stage, scale development study was carried out with the data obtained from 532 participants.

3.4. Data analysis

Three different computer programmes were used within the scope of the study. Firstly, explanatory factor analysis and reliability analysis were performed with *SPSS 22* package programme. In the second stage, confirmatory factor analysis was performed with *LISREL 8.71* package programme. Finally, the common variance values obtained with *SmartPLS* package programme were calculated.

4. Result

Table 2 Shows the demographic characteristics of the 532 participants took part in this study.

The demographic characteristics of the participants were analysed, 271 women (50.1 %) and 261 men (49.1 %) participated in the study while 270 were married (50.8 %), 251 were single (47.2 %) and 11 were widowed-divorced (2.1 %). As for the educational status 174 (32.7 %) participants had an associate's degree, 166 (31.2 %) had a bachelor's degree, 119 (22.4 %) had a master's degree and 73 (13.7 %) had a doctorate degree. The ages of the participants ranged between 18 and 70, with an average age of 33 $\pm$ 9.77. The professional experience of the participants ranged between 1 year and 40 years with a mean of 10 $\pm$ 8.71 years.

The findings of the scale development study were evaluated in two parts. In the first part, the construct validity of the scale was analysed. In the second part, the results of the reliability analysis were presented.

4.1. Validity of the charity hazard scale

In order to reveal the construct validity of the charity hazard scale, explanatory factor analysis and confirmatory factor analysis procedures should be performed [39]. In explanatory factor analysis, two different tests are applied to determine the suitability of the data. In the first stage of the exploratory factor analysis, Kaiser-Meyer-Olkin Measure of Sampling Adequacy was applied. The purpose of the Sampling Size Test is to determine whether the number of people reached for the scale and participating in the survey is sufficient. As a result of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, this value should be above 0.70. In the second stage of the exploratory factor analysis, Bartlett's Test of Sphericity was applied. The purpose of Bartlett's Sphericity Test is to determine whether the data collected for the scale show diversity or not. As a result of Bartlett's Test of Sphericity, the p value should be less than 0.05 [40,41]. Accordingly, the KMO test result for the data set was calculated as 0.769 and the Bartlett's test result was calculated as 0.000. Based on these results, it is seen that the relevant data set is suitable for explanatory factor analysis.

Table 2
Demographical characteristics of the participants.

Variable	n	%
Gender		
Female	271	50.9
Male	261	49.1
Marital Status		
Married	270	50.8
Single	251	47.2
Widowed-Divorced	11	2.1
Educational Status		
Associate's Degree	174	32.7
Bachelor's Degree	166	31.2
Master's degree	119	22.4
Doctorate degree	73	13.7
Total	532	100

After proving that the data obtained from the sample used for the scale provided sufficiently broad and deep information, the rotated matrix process was carried out in the factor analysis process. At this stage, "Principal Component Analysis" was used as factor derivation method and "Varimax with Kaiser Normalization" was used as rotation method. In order for the scale items to be connected to a factor and a good measurement to be made, the minimum factor loading value should be 0.45. (Bayram, 2004).

Table 3 Shows the factors obtained by Varimax rotation method and the factor loads of the scale items linked to these factors. While the scale development study started with 20 items, 6 items were eliminated as a result of Varimax rotation method analyses and 14 items remained. As a result of the analysis, it was seen that the items yt1, yt2, yt3, yt7, yt15 and yt16 were eliminated since factor loadings were less than 0.45. As a result of the analysis, it is seen that there are 4 factors with eigenvalue greater than 1. Accordingly, the factor loadings of the 14 items in the scale ranged between 0.589 and 0.927 and the eigenvalues of the factors ranged between 1.771 and 2.765. Explained variance ratios varied between 12.65 % and 19.74 % and the total variance ratio was 63.24 %. Finally, it is possible to assume that the conditions of explanatory factor analysis are fulfilled by calculating the total variance ratio above 50 % [42].

Confirmatory factor analysis was applied to the 4-factor structure revealed as a result of the exploratory factor analysis through *LISREL 8.71* package programme. In confirmatory factor analysis, 2 issues are observed when examining the significance of the items with the *LISREL* package programme. In the first point, the "t" value at which the items are connected to the factors should be above 1.96. Fig. 1 Shows the "t" values of the scale. As a result of the analysis, it is seen that all paths between items and factors are significant.

The second important point of significance is that the standardised factor loading value must be greater than 0.50 [43–45]. Fig. 2 Shows the standardised coefficient solutions of the scale. As a result of the analysis, it is seen that the standardised factor loadings are between 0.51 and 0.95 and all of them are above 0.50.

After the 6 items eliminated from the exploratory factor analysis, the confirmatory factor analysis continued with 14 items. As a result of the analyses required by the scale development study, 4 items were eliminated in the confirmatory factor analysis and 10 items remained. The items yt4, yt5, yt6 and yt11 and the first factor (F1) were eliminated since the "t" value of the items connected to the factors was below 1.96 and/or the standardised factor loading value was below 0.50. While 14 items and a 4-factor structure were explained in the charity hazard scale development study, the possibility of confirming a 10-item and 3-factor structure emerged.

In the last stage of confirmatory factor analysis, the significance of the remaining items and the goodness of fit index values should be analysed in the *LISREL* package programme for the verification of the factors. Accordingly, the X^2/sd value of the scale is expected to be below 5, and the RMSEA and SRMR values are expected to be below 0.08. In addition, NFI value is expected to be above 0.90, NNFI and CFI values above 0.95, GFI value above 0.90, and AGFI value above 0.85 [40,44,56].

4.2. Reliability of the charity hazard scale

Internal consistency (Cronbach's Alpha) test and composite reliability (CR) test were applied to test the reliability of the charity hazard scale. As a result of the analysis, as can be examined in the descriptive statistics and correlation matrix for the charity hazard scale in Table 4, the internal consistency value of the "Awareness" factor is 0.627, the internal consistency value of the "Belief" factor

Table 3
Factor loadings obtained by varimax rotation method.

Item No	Scale Questions	Factors and Factor Loadings			
		F1	F2 (Awareness)	F3 (Belief)	F4 (Ethics)
yt4	A share should be allocated from the state budget for measures to be taken against disasters.	.813			
yt5	A share should be allocated from the household budget for measures to be taken against disasters.	.727			
yt6	I believe that not taking the necessary measures against disasters is more costly than taking them.	.653			
yt8	I find it necessary that financial aid provided by the state after disasters should not be provided to everyone, but to those who take measures against disaster risks.		.757		
yt9	I believe that the abolition of post-disaster financial aids will increase the measures to be taken against disasters.		.752		
yt10	I do not consider it necessary for the state to guarantee financial aid after disasters.		.688		
yt11	I believe that the financial aid provided by the state after disasters is political.			.615	
yt12	I find it necessary to take preventive measures against disasters because I do not believe that I will receive financial aid from my close environment (family, friends, etc.) after disasters.			.702	
yt13	Since I do not believe that I will receive financial aid from the state after disasters, I find it necessary to take preventive measures against disasters.			.887	
yt14	Since I do not believe that I will receive financial aid from non-governmental organisations after disasters, I find it necessary to take preventive measures against disasters.			.886	
yt17	Instead of taking measures against possible disasters, I consider receiving financial aid from my close environment (family, friends, etc.) after disasters as avoiding my responsibilities.				.803
yt18	Instead of taking measures against possible disasters, I consider receiving financial aid from the state after disasters as avoiding my responsibilities.				.908
yt19	Instead of taking measures against possible disasters, I consider receiving financial aid from non-governmental organisations after disasters as avoiding my responsibilities.				.927
yt20	It is a moral problem to wait for financial aid after disasters instead of taking measures against disasters.				.589
Eigenvalue		1.771	1.796	2.522	2.765
Variance Explained		12.65	12.82	18.01	19.74
Total Variance Explained		63.24			

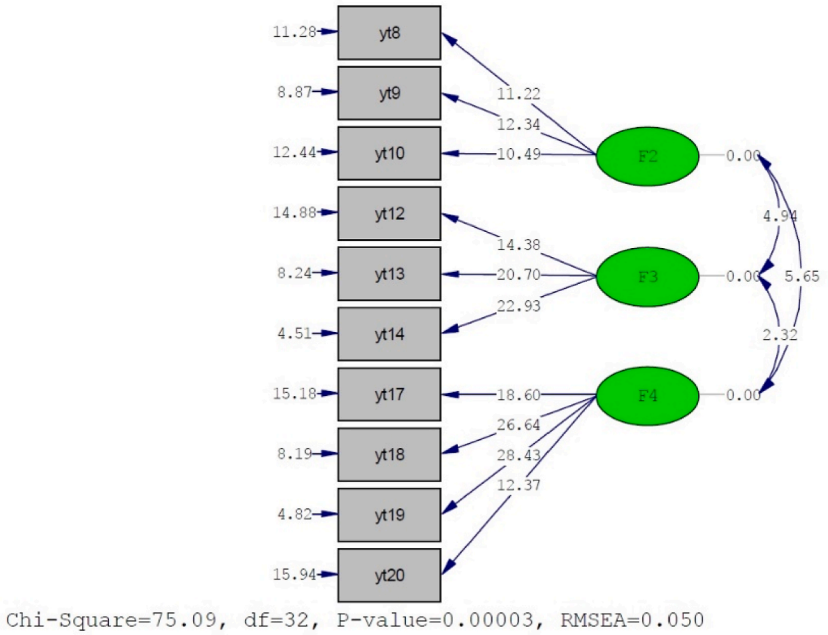

Fig. 1. Charity Hazard Scale t-Values.

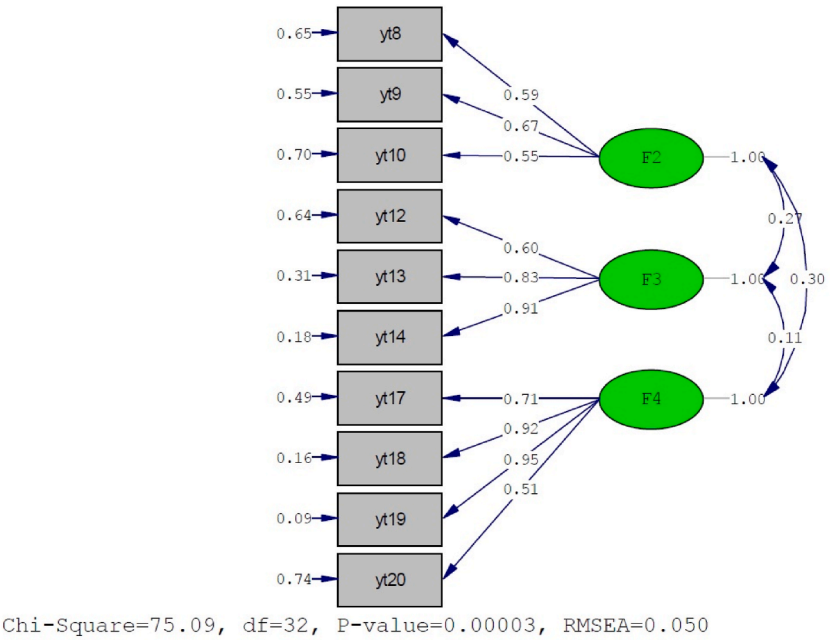

Fig. 2. Charity hazard scale standardised coefficients.

is 0.822, the internal consistency value of the "Ethics" factor is 0.844 and finally the internal consistency value of the whole "Charity Hazard Scale" is 0.758. As a result of the calculated values, it was revealed that the scale has internal consistency. In addition, as a result of the composite reliability test (CR), it is seen that the value of the "Awareness" factor is 0.777; the value of the "Belief" factor is 0.777; the value of the "Ethics" factor is 0.887 and finally the value of the whole "Charity Hazard Scale" is 0.945. As a result, the values obtained from the analyses reveal that the unified reliability of the charity hazard scale is appropriate (Bagozzi and Yi, 1988).

As can be seen from the descriptive statistics and correlation matrix analysis results of the charity hazard scale in Table 4; the mean of the awareness factor was 2.58 ± 0.89, the mean of the belief factor was 3.21 ± 0.95, the mean of the ethical factor was 3.45 ± 0.94 and finally the mean of the help hazard scale was 3.08 ± 0.63. According to the results of the analyses, it was revealed that the highest mean in the 3-factor scale was ethics, the second mean was belief and the lowest mean was awareness. When the cor-

Table 4
Complementary statistics and correlation matrix for the charity hazard scale.

	Mean ± SD	Cronbach's Alpha	CR	Awareness	Belief	Ethics
1. Awareness	2.58 ± 0.89	0.627	0.777	–	–	–
2. Belief	3.21 ± 0.95	0.822	0.777	0.218**	–	–
3. Ethics	3.45 ± 0.94	0.844	0.887	0.260**	0.148**	–
4. Charity Hazard	3.08 ± 0.63	0.758	0.945	0.686**	0.653**	0.654**

*p < 0.05, **p < 0.01.

relations between the factors and the scale were analysed, it was seen that there was a weak, positive and significant relationship between awareness and belief (r: 0.218; p < 0.01). Similarly, it was observed that there was a weak, positive and significant relationship between awareness and ethics (r: 0.260; p < 0.01). There was a moderate, positive and significant relationship between awareness and charity hazard scale (r: 0.686; p < 0.01). A very weak, positive and significant relationship was observed between belief and ethics (r: 0.148; p < 0.01). There was a moderate, positive and significant relationship between belief and charity hazard scale (r: 0.653; p < 0.01). Finally, there was a moderate, positive and significant relationship between ethics and charity hazard scale (r: 0.654; p < 0.01).

5. Discussion

Table 5 Shows the goodness of fit index values for the charity hazard scale. After the analysis, the scale was determined as $X^2/sd = 2.346$, RMSEA: 0.050, SRMR: 0.048, NFI: 0.97, NNFI: 0.97, CFI: 0.98, GFI: 0.97, AGFI: 0.95 The values obtained according to the results of the analyses were calculated above the acceptable goodness of fit index values, and it was revealed that the 3-factor structure was confirmed.

After the confirmatory factor analysis of the scale is completed, its convergent validity should be tested. For convergent validity, the Average Variance Extracted (AVE) value should be above 0.50 [48]. In addition, the square root of the value of the average variance extracted should be above the correlation values in the relevant column [51]. Convergent validity values for the scale are shown in Table 6. As can be seen in the table, the average variance values of the factors are above 0.50. However, the square root of the value of the average variance extracted is higher than the correlation values in the relevant column. Thus, as a result of the analyses, it was revealed that the charity hazard scale has convergent validity.

As a result of the analyses conducted within the scope of the study, it is possible to state that the charity hazard scale is a valid scale. The reliability of the scale, whose validity is established, should also be tested.

Table 7 Shows the reliability results for charity hazard. According to the results of the analyses, item-total correlations varied between 0.318 and 0.544. Values above 0.30 and below 0.90 indicate that the distinctiveness power of the items is high [46]. In addition, it is seen that the internal consistency coefficient does not increase in case of deletion of any of the scale items.

As a result of the analyses, it will be useful to examine the 3 factors to which the items of the charity hazard scale, whose validity and reliability were revealed, were connected. The first factor of the charity hazard scale was named as "Awareness". There are 3 items in the awareness factor. Within the scope of disaster management, this factor refers to the awareness of the risk management phases to be applied before the disaster and the crisis management phases to be applied after the disaster (E.g. I find it necessary that financial aid provided by the state after disasters should not be provided to everyone, but to those who take measures against disaster

Table 5
Goodness of fit index values for the charity hazard scale.

Goodness of Fit Index	Acceptable Goodness of Fit Index Value	Goodness of Fit Index Values of the Scale
X^2/sd	<5	75.09/32 = 2.346
RMSEA	<0.08	0.050
SRMR	<0.08	0.048
NFI	>0.90	0.97
NNFI	>0.95	0.97
CFI	>0.95	0.98
GFI	>0.90	0.97
AGFI	>0.85	0.95

Table 6
Convergent validity values of the charity hazard scale.

	Convergent Validity AVE	Awareness	Belief	Ethics	Charity Hazard
1. Awareness	0.539	0.734[a]	0.218**	0.260**	0.686**
2. Belief	0.537	0.218**	0.732[a]	0.148**	0.653**
3. Ethics	0.669	0.260**	0.148**	0.817[a]	0.654**
4. Charity Hazard	0.635	0.686**	0.653**	0.654**	0.796[a]

[a] The value calculated as the square root of the AVE value.

Table 7
Reliability results for the charity hazard scale.

Items	Mean (SD)	Item-Total Correlation	Cronbach's Alpha If Item Deleted
yt8	2.75 (1.25)	0.344	0.751
yt9	2.67 (1.18)	0.383	0.745
yt10	2.32 (1.10)	0.318	0.753
yt12	3.20 (1.11)	0.385	0.744
yt13	3.26 (1.11)	0.368	0.747
yt14	3.19 (1.09)	0.429	0.739
yt17	3.53 (1.10)	0.477	0.732
yt18	3.40 (1.14)	0.526	0.724
yt19	3.43 (1.12)	0.554	0.721
yt20	3.43 (1.18)	0.445	0.736

risks). The awareness factor of the charity hazard scale does not contain any reverse item. When calculating the score of the factor, the average of the lowest 1 point and the highest 5 points given by the participants to the 3 items of the factor is taken. It will be possible to state that as the participants' scores on the awareness factor increase, their awareness of disaster also increases.

The second factor of the scale was named as "Belief". There are 3 items in the belief factor. This factor expresses the belief in the financial aid that can be received from the close environment (family, friends, etc.), the state and non-governmental organisations after disasters (E.g. Since I do not believe that I will get help from the state after disasters, I find it necessary to take preventive measures against disasters). The belief factor of the charity hazard scale also does not contain reverse items. When calculating the score of the factor, the average of the lowest 1 point and the highest 5 points given by the participants to the 3 items of the factor is taken. It will be possible to state that as the score given by the participants to the belief factor increases, the proactive measures they will take to minimise disaster damages will increase.

The third factor of the scale was named as "Ethics". There are 4 items in the ethics factor. This factor refers to the evaluation of moral responsibilities towards disasters (E.g. It is a moral problem to wait for financial aid after disasters instead of taking measures against disasters). The ethical factor of the charity hazard scale also does not contain reverse items. When calculating the score of the factor, the average of the lowest 1 point and the highest 5 points given by the participants to the 4 items of the factor is taken. It will be possible to state that as the participants' scores on the ethical factor increase, their humanitarian responsibilities towards disasters will increase.

When the scale is evaluated as a whole, while calculating the score of the scale, the average of the lowest 1 point and the highest 5 points given by the participants to the 10 items is taken. As the score given by the participants in the scale increases, it will be possible to state that they will exhibit responsible behaviour, take proactive measures, have high awareness against disasters and will not be in dilemma about charity hazard.

5.1. Limitations of the study

The present study was conducted on the basis of the personal declaration of the participants, as in all survey applications. The only limitation of the study is that the participants included in the sampling must have taken at least one of the courses that can contribute to the formation of a safety culture such as Emergency Management, Emergency Aid and Rescue Studies, Disaster and Emergency Management, Disaster Management, Search and Rescue Information, Public Health, First Aid, Occupational Safety, Occupational Health, Occupational Health and Safety, Firefighting and Fire Safety, CBRN (Chemical Biological Radiological and Nuclear), Basic Disaster Training and Fire Protection Methods, etc. In their associate degree, undergraduate, graduate or doctorate education.

6. Conclusion

As a result, it was revealed that the 10-item charity hazard scale was valid and had a high level of reliability. The ready-to-use version of the scale is presented in ANNEX 1.

7. Implications

When the disaster management system used today is evaluated within the scope of safety culture, it can be stated that the most important phase is the risk management phase which should be implemented before the disaster. Correct implementation of the risk management phase is of great importance both for the disaster victims exposed to the disaster and for the institutions, organisations and states to which the disaster will cause economic damage. It is possible to state that the concept of charity hazard emerged here. Failure of the people who know that they will receive financial aid after the disaster to take the necessary actions in the risk management phase will increase the disaster exposure. In this research, a measurement tool was developed to assess the awareness of the charity hazard. As charity hazard becomes a measurable concept, it will be possible to manage it. By increasing the awareness of relief hazard, both disaster victim's losses and economic vulnerability can be reduced.

The present study was conducted with the participants taking at least one of the courses that can contribute to the formation of a safety culture such as Emergency Management, Emergency Aid and Rescue Studies, Disaster and Emergency Management, Disaster Management, Search and Rescue Information, Public Health, First Aid, Occupational Safety, Occupational Health, Occupational Health and Safety, Firefighting and Fire Safety, CBRN (Chemical Biological Radiological and Nuclear), Basic Disaster Training and

Fire Protection Methods, etc. In their associate degree, undergraduate, graduate or doctorate education. As in the sample of the study, studies can be carried out to assess the awareness of people on charity hazard, who have received education on these issues, who continue their professional lives in these fields and/or who carry out academic studies in these fields, and to determine whether they will fall into any dilemma. In addition, it will be possible to reach a larger sample without any course requirement in higher education etc. In future studies with the charity hazard scale whose safety and validity have been ensured. In addition, research with employees in the field of occupational health and safety can also support future research. In particular, determining the relationship between charity hazard and productivity, the risk of occupational accidents and who is at risk of charity hazard can make important contributions to this area specifically in the context of future research. It is aimed to make a positive contribution within the scope of safety culture by using the charity hazard scale in various studies in the fields of Emergency Aid and Disaster Management and Occupational Health and Safety.

Declaration of competing 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.

Data availability

Data will be made available on request.

Annexes

Annex 1
Ready to Apply Charity Hazard Scale.

Item	Please indicate your degree of agreement with the following statements	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	I find it necessary that financial aid provided by the state after disasters should not be provided to everyone, but to those who take measures against disaster risks.	1	2	3	4	5
2	I believe that the abolition of post-disaster financial aids will increase the measures to be taken against disasters.	1	2	3	4	5
3	I do not consider it necessary for the state to guarantee financial aid after disasters.	1	2	3	4	5
4	I find it necessary to take preventive measures against disasters because I do not believe that I will receive financial aid from my close environment (family, friends, etc.) after disasters.	1	2	3	4	5
5	Since I do not believe that I will receive financial aid from the state after disasters, I find it necessary to take preventive measures against disasters.	1	2	3	4	5
6	Since I do not believe that I will receive financial aid from non-governmental organisations after disasters, I find it necessary to take preventive measures against disasters.	1	2	3	4	5
7	Instead of taking measures against possible disasters, I consider receiving financial aid from my close environment (family, friends, etc.) after disasters as avoiding my responsibilities.	1	2	3	4	5
8	Instead of taking measures against possible disasters, I consider receiving financial aid from the state after disasters as avoiding my responsibilities.	1	2	3	4	5
9	Instead of taking measures against possible disasters, I consider receiving financial aid from non-governmental organisations after disasters as avoiding my responsibilities.	1	2	3	4	5
10	It is a moral problem to wait for financial aid after disasters instead of taking measures against disasters.	1	2	3	4	5

1,2,3; Awareness 4,5,6; Belief 7,8,9,10; Ethics.

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