Id: 1640840

Participatory Educational Research (PER)
Vol.12(3), pp. 176-195, May 2025
Available online at http://www.perjournal.com
ISSN: 2148-6123
http://dx.doi.org/10.17275/per.25.39.12.3

Disaster Management Awareness Scale: A Study on Validity and Reliability

Yurdal Dikmenli
Kırşehir Ahi Evran University, Faculty of Education, Department of Elementary Education, 40100 Kırşehir, Türkiye
ORCID: 0000-0003-3738-3095

Hamza Yakar*
Kırşehir Ahi Evran University, Faculty of Education, Department of Educational Sciences, 40100 Kırşehir, Türkiye
ORCID: 0000-0002-9334-3525

Article history

Received:
16.01.2025

Received in revised form:
01.03.2025

Accepted:
19.03.2025

Key words:
Disaster, Disaster Management, Teacher candidates, Scale development, Factor analysis

The purpose of this study is to develop a scale aimed at determining the level of disaster management awareness among teacher candidates. The study group consists of 645 teacher candidates enrolled in different departments of the Faculty of Education at Kırşehir Ahi Evran University of Türkiye during the 2023-2024 academic year. 77.3% of the teacher candidates in the sample are female and 22.6% are male. After reviewing the relevant literature, the initial version of the scale consists of 63 items. To determine the validity of the scale, an exploratory factor analysis was conducted, and item factor total correlations and item discrimination values were calculated. To assess the reliability of the scale, internal consistency and stability levels were computed. Twelve items were removed from the scale due to their factor loadings being below 0.40, resulting in a final item count of 51. In conclusion, a 4-dimensional disaster management awareness scale was developed, comprising 51 items, including 4 reverse-scored items. The dimensions that make up the scale are identified as "damage reduction," "preparation," "intervention and recovery," and "negative perception." The analyses indicate that the scale is a valid and reliable tool for assessing the level of disaster management awareness among teacher candidates.

Introduction

Disasters occur almost every day, appearing through headlines, but most happening in distant places and quickly fading from memory. Some disasters, depending on their impact and magnitude, remain in the global agenda for a longer period (Van Westen, 2013). It is crucial to be aware of what countries do within the scope of disaster management for disasters that are constantly on the public's agenda, as well as to have consciousness about them. Disaster management has emerged as a necessity in the face of significant destruction and challenges resulting from disasters. Teachers are responsible for disseminating information about disaster management among students (Vijaya, 2014). This is because teachers are expected to be more knowledgeable, conscious, and aware of disasters compared to other groups.

* Correspondency: hmzyakar@gmail.com

Disaster management is an approach that encompasses all individuals in society. In terms of inclusivity, students in schools are also included in this understanding. When considering inclusivity, the greatest responsibility for students to receive disaster education lies with teachers. Therefore, the necessity for teachers to have awareness of disaster management underscores the importance of this research. In Türkiye, regarding this matter, a protocol named "School-Based Disaster Education" was signed in 2010 between the Ministry of National Education Teacher Training and Development General Directorate and the Japan International Cooperation Agency (JICA) (Akbıyık, 2019, p. 7). It is of great importance for teacher candidates to receive education on disaster awareness during their training, both personally and to instill disaster awareness in their students (Kiraz, 2021, p. 7).

In terms of addressing regional gaps that need to be considered at the national and local levels for an effective disaster management system, it is necessary to raise awareness and provide education to the public (Lawrance & Suresh, 2012, p. 4524). Disaster management aims to reduce or avoid potential losses arising from hazards, provide quick and appropriate assistance to disaster victims, and ensure rapid and effective recovery (Warfield, 2008, p. 111). When considered as an integrated system, disaster management encompasses comprehensive and broad-scale planning.

One of the methods for determining disaster management awareness is the development of awareness scales informed by the literature in the field of disaster management. In the literature, various scales have been developed for disaster education, disaster perception, and disaster awareness. Some of these include the "Disaster Practices Perception Scale", "Disaster Management System Scale", "Disaster Planning Local Organization Scale" (Yaylacı, 2015), "Disaster Awareness Scale" (Dikmenli, Yakar & Konca, 2018), "Disaster Literacy Scale" (Çalışkan & Üner, 2022), "Disaster Preparedness Scale" (Şentuna & Çakı, 2020), "Disaster Intervention Self-Efficacy Scale" (Koca, Cagan & Ture, 2020), "University Students' Disaster Risk Perception Scale" (Mızrak & Aslan, 2020), and "Disaster Attitude Scale" (Türkan, Kılıç & Tiryakioğlu, 2019). The scale developed in this research stands out from others by being designed both for teacher candidates and for addressing inclusive and general awareness topics like disaster management.

This study was conducted to determine the level of awareness among teachers regarding disaster management and to create awareness on this topic. Awareness of disasters and disaster management is a result of a process, and the formation of knowledge, skills, and behavior takes time.

Conceptual Framework

Disaster

Various natural events occur in a continuous cycle. While some of these events inherently have a destructive impact, others gain the status of a disaster through human involvement. The concept of a disaster has been defined by scientists and institutions based on the manner of occurrence, cause-and-effect relationships, and impacts, depending on their perspectives and areas of interest. The United Nations Office for Disaster Risk Reduction (UNISDR, 2009) confirms that disasters result from the convergence of hazards, vulnerabilities, and lack of preparedness. Proper planning, coordination, and utilization of appropriate resources can minimize the damages caused by these events. This emphasizes the

importance of taking necessary measures to reduce the risks associated with disasters (Alexander, 2003).

Disasters are serious disruptions of the functioning of a community or a society, involving widespread human, material, economic, or environmental losses and impacts, which exceed the affected community's ability to cope using its own resources. They result from the interaction between hazards and conditions of vulnerability, exposure, and capacity to respond (UNDRR, 2020; Alexander, 2005; Burton & Kates, 1964). Considering the general characteristics of disasters, they can be described as events that are difficult to resist at the local level, requiring regional, national, or international efforts, unpredictable, sudden, and causing extensive damage (Hoyois, Scheuren, Below, & Guha-Sapir, 2007). Although disasters are defined as natural events causing destruction and adversity, attributing all the blame to nature is a simplistic and incorrect notion (Quarantelli, 1998). The real culprit in the transformation of these events into disasters is humans. Faults in this context include damaging nature, acting without awareness in spatial formations, ignoring natural balance, and exhibiting behaviors that are reckless and unsustainable.

Throughout history, the world has witnessed numerous devastating disasters. The 9.1-magnitude earthquake in the Indian Ocean on December 26, 2004, and the subsequent tsunami affected several countries, including Indonesia, Thailand, Sri Lanka, and India, causing approximately 230,000 deaths (Mori et al., 2011). Similarly, the 7.0-magnitude earthquake that struck Haiti in 2010 resulted in over 160,000 fatalities, leading to a severe humanitarian crisis (DesRoches et al., 2011). In Türkiye, the 7.4-magnitude Marmara Earthquake on August 17, 1999, claimed more than 17,000 lives and became one of the most destructive earthquakes in the country's history (Barka, 1999). More recently, the earthquakes centered in Kahramanmaraş on February 6, 2023, with magnitudes of 7.8 and 7.5, led to over 50,000 casualties and widespread destruction (AFAD, 2023). Additionally, the massive wildfires in the Mediterranean and Aegean regions in 2021, as well as the 2021 Kastamonu-Bozkurt flood disaster, are among the other significant disasters that have occurred in Türkiye (Demirtaş, 2022).

Disaster Management

The occurrence of disasters is often unavoidable, and their effects cannot be completely eliminated. However, with certain measures taken by leaders, local governments, communities, or individuals, these damages can be minimized, preventing significant destruction. Generally, the disaster management cycle consists of four distinct stages: "mitigation", "preparedness", "response" and "recovery". The goal of the mitigation stage is to reduce the impact of disasters. In the response stage, providing essential disaster management services to save lives, protect property, and preserve the environment is crucial. The recovery stage involves activities related to restoring systems to their normal levels after a disaster (Yu, Yang & Li, 2018). Considering all these aspects together, everything done to eliminate or minimize the damage caused by disasters can generally be referred to as disaster management. The primary goal in disaster management is to identify hazards and risks and maintain them at manageable levels when they occur. Despite taking precautions, it is not realistic to expect the complete elimination of all risks associated with disaster management, and such a goal is not achievable (Al Khalaileh, Bond, and Alasad, 2012). All efforts aimed at making people aware of natural events occurring in their environment, understanding them, and working towards minimizing the impact or avoiding any impact in the event of their recurrence are collectively referred to as disaster management.

In the modern disaster management process, activities related to understanding disasters, identifying risks, reducing losses and damages, and pre-disaster preventive measures such as early warning are considered as risk management. Post-disaster activities such as impact analysis, intervention, recovery, and reconstruction are regarded as crisis management (Kadıoğlu, 2008). However, in an effective and manageable disaster management process, the primary stage is risk management. If risk management, which encompasses the pre-disaster phase, is not properly and effectively handled, the success of crisis management covering the post-disaster phase is not possible. In fact, many measures taken for disaster prevention may not make sense. In this context, an effective disaster management plan should encompass all the necessary activities before, during, and after the disaster. A successful outcome of the intervention in a disaster requires a comprehensive and adaptable disaster management plan that begins long before the disaster occurs (Perry, 2007).

Disaster management involves understanding the hazards and risks that can lead to disasters, taking preventive measures against these hazards and risks before incidents occur, and eliminating them with correct and effective methods. It also encompasses mental and operational plans, preparations, exercises, and survival efforts to ensure that the negative consequences of a disaster can be managed to tolerable levels. In this effort, responsibilities are assigned to everyone from individual citizens to the highest authorities in disaster-related tasks. The disaster management system of each country is shaped by the accumulation of its past experiences with disasters. It is a comprehensive framework that includes both proactive measures to prevent disasters and reactive measures to reduce the impact and cope with the aftermath of disasters. This situation has led each country to take more precautions for certain disasters due to their specific characteristics and experiences. Consequently, each country has made progress in taking measures against the disasters it most frequently faces, suffers from, incurs damage, or finds itself in difficult situations. In this regard, collaborating with experienced countries when they lack sufficient capacity to cope with the disasters they encounter is beneficial for them (Erkal & Değerliyurt, 2009).

Like all countries in the world, Türkiye is a country that could face various disasters at any moment. Therefore, the "Türkiye Disaster Risk Reduction Plan" (TDRRP) was prepared in 2022 with the aim of identifying risks for disasters occurring in Türkiye and taking necessary measures before the disasters happen. Covering the period from 2022 to 2030, the plan was developed to be in line with the Sendai Disaster Risk Reduction Plan. This plan aims to centralize the understanding of disaster risk management and coordinate the preparation process for disasters in a more organized manner. According to this plan, the Disaster and Emergency Management Presidency [Afet ve Acil Durum Yönetimi Başkanlığı, (pronounced AFAD)] is designated as the disaster management center in Türkiye, and all government institutions, the private sector, civil society organizations, and the public are included in this management (AFAD, 2022). In Türkiye, disaster management is addressed not only at the national level but also at the local level. For this purpose, the "Provincial Disaster Risk Reduction Plan" (PDRRP) is prepared to identify possible risks and take measures against these risks at the regional level (province or district). PDRRP is a roadmap that needs to be prepared in collaboration with all relevant institutions and stakeholders. Therefore, it is a planning that the entire province, not just one institution, should adopt (İRAP, 2021).

In studies related to disaster management, the evaluation of disaster management is approached from different perspectives and elements. Ofori (2002) focuses on disaster management and post-disaster reconstruction processes in developing countries in his work. Therefore, the existing legal and political frameworks related to disaster management in

countries should be taken into account. In addition, studies highlight the role of civil engineers in disaster management (Gandage & Ranadive, 2008), the role of project management in post-disaster reconstruction processes (Hidayat & Egbu, 2010), the program and project management approach for post-disaster scenarios (Prieto & Whitaker, 2011), and proactive stakeholder involvement in disaster risk management (Mojtahedi & Oo, 2017).

Disaster Awareness and It's Importance

In order to handle disasters, it is essential for individuals, communities, and institutions to be aware of the disaster management process and create awareness at a conscious level. This is because having information does not always translate into awareness. Knowing about a situation is not equivalent to providing appropriate emotional and behavioral responses when an event related to it occurs. It is important for people to be aware of disasters occurring in their countries and be conscious of potential disasters. Additionally, making necessary legal regulations, establishing financial resources, implementing administrative arrangements, and taking physical precautions in the context of disasters will strengthen this awareness. In conjunction with these efforts, recognizing disasters, having awareness of disasters, raising the level of disaster awareness, and being able to exhibit correct behavioral responses during disasters are crucial for protection and effective management of disasters.

In order to increase disaster awareness in society, it is essential to ensure that individuals have knowledge about disasters. In the extensive educational process that plays a significant role in everyone's life, teachers, who serve as exemplary figures, should be conscious role models for students. Students believe that textbooks are insufficient in terms of disaster education and suggest that these books should be redesigned with regard to earthquake-related content (Bayram, 2024). It is important for teachers to have sufficient knowledge about disaster management and convey it to individuals who will contribute to the community's disaster management awareness. Therefore, the level of awareness about disasters among teachers should be monitored, and any deficiencies should be addressed. This way, in schools, where individuals accumulate the most knowledge in life, teachers who impart knowledge should have sufficient awareness and consciousness about disasters. In short, teachers who teach awareness to children should also serve as role models for awareness (Albrecht, 2018).

Literature includes some studies on disaster management awareness, such as one focusing on the disaster awareness of higher education teachers (Vijava, 2014), another on middle school students' awareness of disaster management (Patel, 2018), and one on disaster management awareness among teachers; however, these studies are mostly conducted on a local or specific type of disaster (Kurita, Nakamura, Kodama, & Colombage, 2006). Nevertheless, a scale specifically developed to assess disaster management awareness has not been encountered. Disaster management is a discipline in which humanity constantly strives to reduce the damage caused by disasters. Therefore, the community as a whole should make efforts to collaborate with central and government institutions to collectively intervene in dealing with disasters (Patel, 2018). As is known, disaster management encompasses all efforts and processes aimed at minimizing the impact of disasters and enhancing the capacity to cope with them. Therefore, it is crucial for every individual to have high awareness of disaster management to gain knowledge, consciousness, and awareness for pre-disaster, during disaster, and post-disaster phases, and actively participate in the process. The aim of this study is to develop a scale by testing the reliability and validity of a scale study to determine the level of disaster management awareness. This study is considered important in

contributing to addressing this gap in the literature.

Method

Research Design

This research involves a descriptive survey model and is conducted as a scale development study. The descriptive survey model is a research approach that aims to describe a situation that currently exists or has existed in the past. The subject of the research, whether an individual or object, is attempted to be identified without intervention or an effort to change within its own conditions (Karasar, 2010; Fraenkel, Wallen, & Hyun, 2012). Indeed, this study is a scale development effort aiming to determine the disaster management awareness of teacher candidates.

Study Group

The study group was determined by using the convenience sampling method. Convenience sampling selects participants because they are readily available and easily accessible through this method. It is a non-probability sampling method chosen for its ease, cost-effectiveness, and the researcher's proximity to the subjects (Taherdoost, 2016). In this context, the study group consists of 645 teacher candidates enrolled in the class education, social studies education, preschool education, Turkish education, and mathematics education departments of Kırşehir Ahi Evran University Faculty of Education. The distribution of teacher candidates according to gender, department, and classes is summarized in Table 1.

Table 1. Distribution of teacher candidates by gender and classes

Class Level	Gender		Total
	Female	Male	
1	132	46	178
2	106	17	123
3	142	42	184
4	119	41	160
Total	499	146	645

When Table 1 is examined, it can be observed that the number of female students is higher in each class level in the study group. Considering that women tend to prefer education faculties more in Türkiye, it can be said that this situation is quite common.

Scale Development Process

The development process of the scale began with a comprehensive review of the literature, where studies related to disaster management were identified. Books, articles, theses, and documents published by official institutions on disaster management were examined (AFAD, 2015; Lawrance & Suresh, 2012; Kadıoğlu, 2022; Kiraz, 2021; Patel, 2018; Perry, 2007; Varol, 2019; Vijaya, 2014; Yetiş, 2020). Additionally, documents on disaster management prepared by AFAD were reviewed (AFAD, 2011; AFAD, 2018; AFAD, 2022; Gökçe & Tetik, 2012), and competency statements related to disaster management were identified. These competency statements were itemized and included in the item pool. The created item pool was then sent to three experts in the fields of geography education, measurement and evaluation, and educational programs and instruction for examination. The experts reviewed the items for both content overlap and scope validity. During this process,

the geography education expert suggested adding items related to international collaboration on disaster risk reduction, adopting an anti-discrimination stance in the intervention process of disasters, and improving historical and cultural artifacts. New items were added to the item pool based on the expert's suggestions to ensure content validity. Additionally, considering the feedback from the measurement and evaluation expert to increase the number of reverse-scored items, new reverse-scored items were added to the item pool. Subsequently, a language expert reviewed the items, and unclear expressions were removed, while any misinterpreted statements were corrected.

With the information obtained from the literature and contributions from domain experts, a pool of 63 items has been created. Out of these, 56 items are positive statements, while 7 items are negative statements. Each item in the pool has been paired with a five-point scale to assess students' levels of attitude towards the expressions in the items. The response options are organized and scored as follows: "(1) strongly disagree," "(2) disagree," "(3) neutral," "(4) agree," and "(5) strongly agree."

The final version of the scale has been transferred to a digital platform. Assistance was sought from faculty members working in the departments included in the study group, and under the supervision of these faculty members, the scale was digitally administered to education faculty students. The collected data were uploaded into the SPSS 22.00 program for statistical analysis to conduct validity and reliability analyses of the scale. Values related to negative statements were reverse-coded during the data entry process.

Data analysis

In order to determine the construct validity of the scale, initial analyses were conducted using the KMO (Kaiser-Meyer-Olkin) and Bartlett test through the SPSS 22.00 package program to assess whether a factor analysis should be performed on the scale. The appropriateness of the collected data for factor analysis was examined by obtaining the KMO value, which indicates that data with a value of 0.90 or above are suitable for factor analysis (Russell, 2002). Therefore, before conducting factor analysis to ensure the construct validity of the scale, the KMO and Bartlett test were initially performed on the data collected in the study. As a result, it was decided to perform exploratory factor analysis. The principal component analysis method was used during exploratory factor analysis. Factor loadings were calculated using the Varimax rotation technique (Balcı, 2009). Following the principal component analysis, items with factor loadings below 0.30 and items with a difference of less than 0.1 between two factor loadings were excluded (Scherer, Wiebe, Luther & Adams, 1988). It is considered sufficient for behavioral sciences that factor loadings of items are above 0.30, and the scale items explain at least 40% of the general variance (Kline, Sulsky & Rever-Moriyama, 2000).

The basis for evaluating the results of factor analysis is formed by factor loadings (Balcı, 2009). A high factor loading for an item indicates that the item is an indicator of the corresponding factor (Büyüköztürk, 2002). Additionally, the common factor variance is crucial for multifactorial structures. If the common factor variance is below 0.20, it may require removing that item from the scale (Çokluk, Şekercioğlu, & Büyüköztürk, 2010). For the reliability of the scale, the internal consistency coefficient was calculated. The Cronbach's Alpha reliability coefficient was used as the internal consistency coefficient. A reliability coefficient of 0.70 or above indicates the reliability of the scale (Büyüköztürk, 2002).

Results

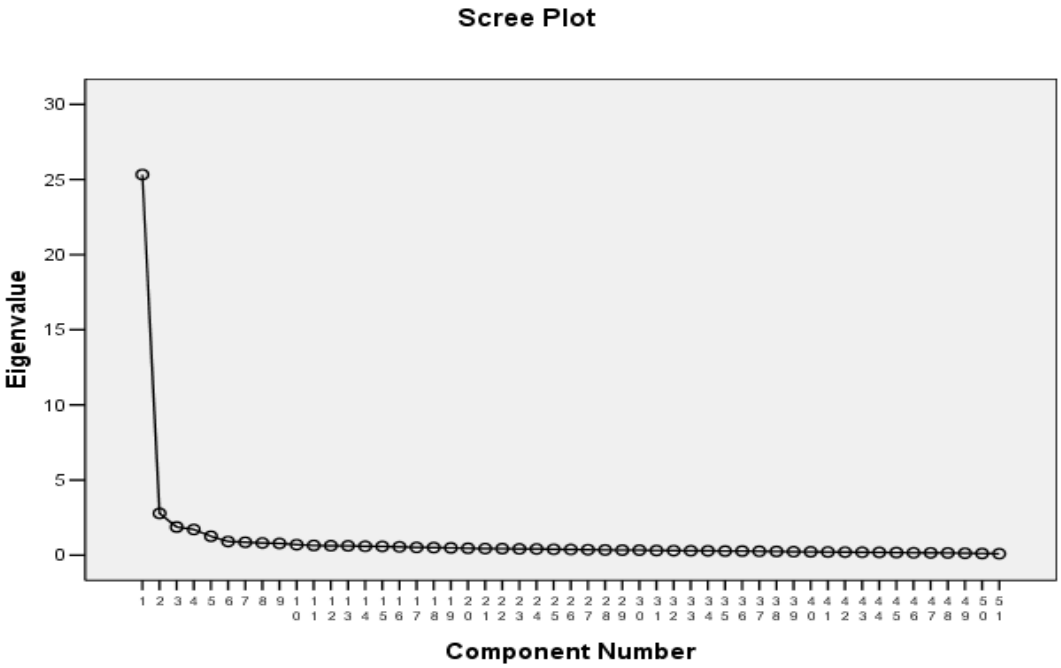
Findings Regarding the Validity of the Scale

Construct Validity

Skewness values were found to be within the expected range of -1.5 to +1.5. Based on this, it was assumed that the data followed a normal distribution (Büyüköztürk, 2021). To test the structural validity of *Disaster Management Awareness Scale* (DMAS) and to assess the adequacy of the sample, the KMO value and Bartlett's Sphericity Test value were examined. The KMO value was 0.971, and Bartlett's Sphericity Test value was $\chi 2= 30778.005$; sd=1953, p=0.000 ($p<0.05$), indicating that the sample was sufficient and suitable for factor analysis (Gürbüz & Şahin, 2018). Principal component analysis (PCA) was conducted using the Varimax rotation technique to determine whether the four-factor structure identified in creating the item pool could be replicated. As a result of the analysis, 12 items with factor loadings below 0.40 were examined, and it was observed that removing them did not compromise the content validity, resulting in a gradual reduction in the scale. The initial item count of DMAS, which was 63, was revised to 51 items. During EFA, after removing each item, the analysis was rerun. Of the initially determined 7 reverse-scored items in the scale, 3 were removed based on the analysis results, and 4 remained in the scale. These items are the 31st, 55th, 58th, and 63rd items.

When EFA was conducted for the 51 items, it was observed that the previously determined factors "damage reduction," "preparedness," "response and recovery," and "negative perception" could explain the awareness of disaster management. As a result of these processes, it was found that the 51 items exhibited a four-factor structure. The KMO value for the scale was 0.976, and Bartlett's Sphericity Test value was $\chi 2=27673.275$; sd=1275, $p<0.001$. It was determined that the scale items and factors explained 62.14% of the total variance.

The scree plot in Figure 1 demonstrates the number of factorial structures of the scale. The scree plot is a graph that shows the explanatory power of the factors, indicating that factors beyond a certain point contribute very little to the explained variance, displaying a plateau or flattening (Gürbüz & Şahin, 2018). Considering the eigenvalues greater than 1 as significant (Yaşlıoğlu, 2017), it can be said that, after the first four points on the scree plot, the variance of the subsequent factors does not significantly impact the analysis. In the scree plot, the first factor on the y-axis has a considerable explained variance, while the other three factors show similar ratios as they decline.



Graphic 1. Scree plot graph

The findings related to the factor loadings of the 51 items under the four factors, the eigenvalues of the factors, and the amounts of explained variance in DMAS are presented in Table 2.

Table 2. Factor and factor distribution loads of social media scale

	Items		Com. Factor	F1	F2	F3	F4
Factor 1: Intervention and Recovery	M47	I am aware that during the process of providing assistance in disaster interventions, it is important to adhere to ethical principles and not consider people's religion, sect, or nationality.	,718	,705			
	M43	I believe that the primary focus in responding to a disaster should be on saving human lives and providing necessary first aid.	,747	,696			
	M50	I am aware that the goal of activities carried out during the recovery phase is to facilitate the return of individuals affected by a disaster to normal life.	,604	,694			
	M52	In the recovery phase, I believe that the renewal or strengthening of damaged buildings is crucial to mitigate the effects of potential future disasters.	,604	,693			
	M54	I am aware that the recovery phase tends to last longer compared to other stages of disaster management.	,638	,691			
	M46	I believe that timely and organized notifications about disasters provided by the competent authorities are essential for a healthy intervention, preventing information pollution.	,727	,683			
	M49	I am aware that investments made in damage reduction and preparation stages will facilitate the post-disaster process.	,619	,676			
	M45	I believe that in disaster response, all stakeholders should collaborate within the framework of pre-determined division of tasks.	,741	,659			
	M51	I believe that during the recovery phase, it is important not to forget the situation of the disaster victims, as the prolonged process may lead to a decrease in media interest.	,612	,653			

M40	I believe that the primary tasks of the crisis desk include intervention, rescue, addressing nutrition, shelter, and health issues.	,632	,642
M41	I believe it is important for every individual to receive first aid and search and rescue training for the initial intervention after a disaster.	,592	,640
M42	In the initial phase of disaster response, I am aware that each institution should quickly take the necessary coordinated steps, conduct needs and damage assessments, and work together.	,610	,634
M56	I am aware that one of the primary goals of disaster management and recovery is to restore the living standards of disaster victims to at least the pre-disaster level.	,556	,630
M44	I believe that ensuring the safe initiation and uninterrupted continuation of public services is crucial during the intervention phase.	,647	,624
M38	I believe that the duration of intervention in disasters varies depending on the type and impact of the disaster.	,593	,613
M53	I am aware that during the reconstruction phase, referred to as the improvement period, all activities and living conditions of those affected by the disaster should be elevated to a level beyond that before the disaster.	,504	,611
M62	I believe that attempting to restore historical and cultural artifacts damaged in disasters is crucial for cultural heritage.	,620	,607
M59	I believe that collaborating with the local community is essential for the success of recovery efforts.	,532	,600
M60	I am aware that disaster management plans should be flexible and updatable.	,507	,598
M37	I believe that various regulations need to be established for the successful implementation of disaster response measures.	,607	,588
M48	I am aware that within the framework of the Türkiye Disaster Response Plan, there are local, regional, national, and international intervention levels based on the severity of the incident.	,461	,561
M18	I am aware that in order for buildings to be resistant to disasters, it is necessary to produce resilient buildings in compliance with the regulations	,745	,789
M19	I believe that necessary legal, technical, and managerial preparations should be taken before a potential disaster occurs to reduce the damages that may occur.	,787	,764
M20	I am aware that all protective or preventive preparations against disasters need to be completed quickly and effectively.	,713	,708
M25	I am aware that in the process of preparing for disasters, early warning systems tailored to the types of disasters need to be developed.	,712	,702
M23	I am aware that the implementation of disaster preparedness efforts, determination of educational standards, and their support through drills are essential.	,736	,696
M33	I am aware that making all necessary preparations before disasters occur is as crucial as effective intervention during disasters.	,751	,690
M26	I believe that all institutions should have an emergency and disaster management plan to be prepared for disasters.	,778	,688
M21	I am aware of the necessity of preparing a sustainable disaster management plan in the process of disaster	,699	,672

Factor 2: Preparation

		preparedness.				
	M29	I believe that raising awareness among communities and institutions about the benefits of disaster preparedness efforts is crucial.	,714	,669		
	M22	I believe that the first prerequisite for building societal resilience to disasters is to receive disaster education.	,618	,647		
	M24	I believe that in the process of preparing for disasters, it is essential to make planning and logistical preparations for health, first aid, and intervention.	,686	,634		
	M30	I believe it is important to prepare a disaster bag to store emergency supplies and essential documents during the first 72 hours after a disaster until rescue teams arrive.	,589	,620		
	M27	I believe there is a relationship between the preparedness phase and the response phase of disasters.	,626	,595		
	M32	I believe that insuring homes and workplaces during the disaster preparedness phase is an important step in sharing and transferring risk.	,491	,540		
	M28	I am aware that after risk reduction efforts, it is necessary to transition to the disaster preparedness phase.	,524	,499		
Factor 3: Damage Reduction	M12	I believe that establishing the managerial and legal infrastructure of the disaster risk reduction phase can prevent the disaster management system from turning into a managerial crisis.	,630		,708	
	M14	I believe that with the approaches of damage reduction, it is possible to prevent potential secondary effects and losses. This means that not only the primary effects but also the secondary effects of the disaster can be mitigated.	,621		,697	
	M11	I am aware that pre-disaster damage reduction efforts will eliminate societal vulnerabilities.	,549		,659	
	M3	I believe that identifying, developing, and analyzing disaster hazards and risks at different scales (national, regional, urban, neighborhood, and individual structure) is necessary.	,575		,634	
	M13	I am aware that investments in pre-disaster mitigation are generally lower and acceptable compared to the costs required for post-disaster activities.	,488		,594	
	M5	I believe that it is crucial to prioritize mitigation efforts that enhance community resilience by leveraging past disaster experiences before a disaster occurs.	,512		,587	
	M17	I am aware that in disaster management, the general objective of the mitigation phase is to make the community more resilient to disasters.	,579		,577	
	M6	I know that the mitigation phase is the first stage of risk management within the disaster management system.	,426		,568	
	M10	I believe that in the mitigation phase, the collaboration of various disciplines is essential to implement effective measures.	,623		,564	
	M16	I believe that international organizations and cross-border cooperation are essential for reducing the impact of disasters, as disaster effects can transcend national boundaries.	,533		,562	
	M8	I am aware that the protective or preventive measures to be taken in disaster risk reduction efforts are directly related to the type and nature of the disaster.	,488		,529	
Factor 4: Negative	M58	I understand the post-disaster recovery efforts as only the improvement of the physical environment and conditions.	,687			,824
	M55	In the recovery process, I believe that reconstruction activities should not commence immediately without conducting research on the building and ground conditions.	,681			,820

M63	In post-disaster recovery efforts, I believe that the most effective method is to prevent the disaster from ever entering the country's media.	,646				,803
M31	I believe that what is done in the preparedness stage for disasters does not affect the actions taken in the response and post-disaster stages.	,598				,761
	Eigenvalue	11,820	10,212	6,887	2,773	
	Explained Variance	23,176	20,024	13,504	5,438	

When examining Table 2, it is observed that the eigenvalue of the first factor is 11.820, contributing to 23.176% of the total variance, and the factor loadings range from 0.561 to 0.705, consisting of 21 items. The second factor's eigenvalue is 10.212, contributing to 20.024% of the total variance, with factor loadings ranging from 0.499 to 0.789 and comprising 15 items. The eigenvalue of the third factor is 6.887, contributing to 13.504% of the total variance, with factor loadings ranging from 0.529 to 0.708 and consisting of 11 items. The eigenvalue of the fourth factor is 2.773, contributing to 5.438% of the total variance, with factor loadings ranging from 0.761 to 0.824 and comprising 4 items. These factors collectively explain 62.141% of the total variance. The fact that the explained variance is above 50% of the total variance is considered important for factor analysis, and in social sciences, a range between 40% and 60% is generally deemed sufficient, with higher variance indicating a strong factor structure (Yaşlıoğlu, 2017; Karagöz & Köşterelioğlu, 2008).

Item Factor Correlations

In order to test the level of each item's contribution to the overall purpose, item-total correlations were examined. The correlation values between each item and its corresponding factor were calculated and are presented in Table 3.

Tablo 3. Item - factor correlations

F1		**F2**		**F3**		**F4**	
I	**r**	**I**	**r**	**I**	**r**	**I**	**r**
M47	,845**	M18	,824**	M12	,781**	M58	,827**
M43	,847**	M19	,866**	M14	,773**	M55	,824**
M50	,779**	M20	,840**	M11	,731**	M63	,826**
M52	,769**	M25	,848**	M3	,748**	M31	,769**
M54	,786**	M23	,862**	M13	,694**		
M46	,849**	M33	,862**	M5	,710**		
M49	,777**	M26	,885**	M17	,755**		
M45	,853**	M21	,835**	M6	,640**		
M51	,781**	M29	,846**	M10	,781**		
M40	,793**	M22	,796**	M16	,735**		
M41	,771**	M24	,832**	M8	,703**		
M42	,752**	M30	,774**				
M56	,730**	M27	,804**				
M44	,802**	M32	,701**				
M38	,769**	M28	,737**				
M53	,661**						
M62	,784**						
M59	,714**						
M60	,707**						
M37	,773**						
M48	,675**						

(N=645,**=p<0,001)

When examining Table 3, it can be observed that the item-factor correlation coefficients range between 0.661 and 0.853 for the first factor, between 0.701 and 0.885 for the second factor, between 0.640 and 0.781 for the third factor, and between 0.640 and 0.781 for the fourth factor. Each item shows a significant and positive relationship (p<0.001) with the factors, indicating that each item adequately serves the purpose of its respective factor and the scale as a whole.

Item Discrimination

In order to calculate the discriminative power of the scale items, the total scores of the items were ranked from highest to lowest. Upper and lower groups, each consisting of 174 individuals, were created by selecting the first and last 27% of the 645 participants. Analyses regarding whether there are differences in terms of each item, factor, and total scores between the groups are presented in Table 4.

Table 4. t-Test Analysis Result for the Lower Group and Upper Group Mean Scores

F1		**F2**		**F3**		**F4**	
I	**t**	**I**	**t**	**I**	**t**	**I**	**t**
M47	19,749**	M18	12,123**	M12	17,046**	M58	7,790**
M43	19,952**	M19	14,460**	M14	16,692**	M55	7,898**
M50	18,582**	M20	14,641**	M11	14,783**	M63	6,034**
M52	19,334**	M25	16,327**	M3	12,315**	M31	5,250**
M54	20,354**	M23	18,833**	M13	15,963**		
M46	19,478**	M33	16,076**	M5	12,166**		
M49	19,017**	M26	18,887**	M17	18,597**		
M45	19,953**	M21	16,476**	M6	13,892**		
M51	17,268**	M29	17,995**	M10	15,176**		
M40	20,574**	M22	16,049**	M16	15,859**		
M41	18,847**	M24	16,775**	M8	16,294**		
M42	17,106**	M30	16,160**				
M56	19,187**	M27	17,262**				
M44	20,813**	M32	14,606**				
M38	22,393**	M28	18,743**				
M53	19,996**						
M62	18,739**					**F1**	**29,570****
M59	18,997**					**F2**	**21,378****
M60	18,869**					**F3**	**23,190****
M37	19,840**					**F4**	**8,926****
M48	17,294**					**Toplam**	**30,049****

(N=174, sd= 346, **=p<0,001)

Examining Table 4, it is observed that the t-test results for items and factors vary between 5.250 and 30.049, and these differentiations are significant for each item, factors, and total scores (p<0.001). Accordingly, it can be stated that the scale exhibits a high level of discriminative power.

Findings Regarding the Reliability of the Scale

The internal consistency and stability tests of DMAS were conducted to determine whether the scale can provide consistent and stable measurements, and the results are reported below.

Internal Consistency Level

The reliability of the scale was assessed through the calculation of Cronbach's Alpha reliability coefficient, the correlation value between two equal halves, and the Spearman-Brown and Guttmann split-half reliability formulas for all factors and the entire scale, as presented in Table 5.

Tablo 5. Reliability analysis results considering the whole of the scale and its factors.

Factor	Number of items	Two congruent halves correlation	Sperman Brown	Guttmann Split-Half	Cronbach's Alpha
Intervention and Recovery	21	,923	,960	,956	,966
Preparation	15	,908	,952	,944	,965
Damage Reduction	11	,827	,906	,898	,912
Negative Perception	4	,638	,778	,778	,827
Total	51	,856	,922	,922	,969

Upon examination of Table 5, it is observed that the Cronbach's Alpha values range from 0.827 to 0.966, with the overall scale having a Cronbach's Alpha value of 0.969. The correlation values between two equal halves vary between 0.638 and 0.923, with the scale's correlation value being 0.856. Spearman-Brown values range from 0.906 to 0.960, and the scale's Spearman-Brown value is 0.922. Guttmann values vary between 0.778 and 0.956, with the scale's Guttmann value being 0.922. Therefore, it can be concluded that the scale can produce consistent measurements.

Stability Level

The test-retest method was employed to assess the stability level of each item and the overall scale. The scale was administered to 24 individuals, and after a period of 3 weeks, it was re-administered to the same individuals to test the scale's ability to provide stable measurements over time. The results are presented in Table 6.

Tablo 6. Test-retest results of the items of the scale.

F1		F2		F3		F4	
I	r	I	r	I	r	I	r
M47	,571**	M18	,578**	M12	,479**	M58	,392*
M43	,496**	M19	,547**	M14	,427**	M55	,327*
M50	,521**	M20	,562**	M11	,412**	M63	,471**
M52	,613**	M25	,512**	M3	,485**	M31	421**
M54	,624**	M23	,548**	M13	,463**		
M46	,597**	M33	,512**	M5	,397**		
M49	,542**	M26	,492**	M17	,419**		
M45	,492**	M21	,442**	M6	,445**		
M51	,421**	M29	,401**	M10	,407**		
M40	,413**	M22	,478**	M16	,409**		
M41	,421**	M24	,495**	M8	,412**		
M42	,406**	M30	,601**				
M56	,412**	M27	,578**				
M44	,512**	M32	,401**				

M38	,534**	M28	,578**				
M53	,507**						
M62	,401**					**F1**	**,687**
M59	,487**					**F2**	**,691**
M60	,503**					**F3**	**,703**
M37	,417**					**F4**	**,691**
M48	,441**					**Toplam**	**,721**

(N: 24; *=p<0,05; **=p<0,001)

In Table 6, when examining the Pearson correlation coefficients through the test-retest method for the scale, it is observed that the items range between 0.327 and 0.624, the factors range between 0.687 and 0.703, and the total scale is 0.721. All Pearson correlation coefficients are positive and statistically significant, indicating that the scale provides stable measurements.

Discussion

To measure the disaster management awareness of teacher candidates, initially, a pool of 63 items was created. Following the analyses, 12 items with factor loadings below 0.40 were removed from DMAS. Thus, in the first stage, DMAS, which initially had 63 items, was updated to 51 items. The analysis of the 7 reverse-coded items in the item pool resulted in the exclusion of 3, while 4 reverse-coded items (31st, 55th, 58th and 63rd items) remained in the scale. Consequently, a 4-dimensional DMAS, consisting of 51 items with 4 reverse-coded items, was developed. The dimensions constituting DMAS are "damage reduction" (21 items), "preparedness" (15 items), "intervention and improvement" (11 items), and "negative perception" (4 items). The analyses indicate that each item adequately serves the purpose of its respective factor and the scale, and the scale demonstrates a high level of discriminant validity. Additionally, the findings suggest that DMAS provides consistent and stable measurements.

The general disaster management cycle consists of four distinct stages: "damage reduction", "preparedness", "intervention" and "improvement" (Yu, Yang & Li, 2018). When compared with the dimensions of DMAS, there is observed alignment between the overall disaster management cycle and the dimensions of the scale. However, it is notable that in the general disaster management cycle, "intervention" and "improvement" are separate stages, whereas in DMAS, these two stages are combined into a single dimension. Additionally, the DMAS includes a dimension labeled "negative perception," which is not explicitly present in the general disaster management cycle. Teacher candidates may harbor negative perceptions related to disaster management, stemming from both societal attitudes and misconceptions. Hence, the inclusion of this dimension in DMAS is understandable. Additionally, social media and misinformation can negatively impact disaster management awareness (Alexander, 2014). In this context, the concept of "social vulnerability" has increasingly been utilized in disaster literature. Practitioners in disaster management must systematically identify individual, social, and situational vulnerability factors that shape how people access, comprehend, and act on information about hazards (Hansson et al., 2020). Social media platforms, which play a significant role in raising awareness on various topics among today's youth, should also be considered in the context of disaster management. Institutions responsible for disaster management are advised to enhance their presence on social media, engage with followers, and be responsive when tagged during disasters on social media platforms (Okocha, Agbele & Kente, 2023).

In conclusion, it can be stated that DMAS can be used as a valid and reliable tool to assess the disaster management awareness levels of teacher candidates. In the literature, no valid and reliable measurement tool aiming to determine the disaster management awareness levels of university students has been identified. Therefore, it is anticipated that this measurement tool could contribute significantly to the literature. The developed scale can be utilized as a data collection instrument for future research. However, it is important to note that the validity and reliability studies of the measurement tool were limited to education faculty students in the scale development process. To enable the use of the scale in different educational levels, it is recommended to repeat validity and reliability studies.

References

AFAD (Afet ve Acil Durum Yönetimi Başkanlığı) [Disaster and Emergency Management Presidency]. (2011). *İlk 72 saat.* [*First 72 hours*]. Retrieved from https://www.afad.gov.tr/kitaplar on 02.01.2024.

AFAD. (2015). *Afet ve acil durumlara ilişkin temel mevzuat*. [Basic legislation regarding disasters and emergencies]. Retrieved from https://webdosya.csb.gov.tr/db/yapiisleri/icerikler/afad-mevzuat-el-k-tab--20210506180054.pdf on 16.12.2023.

AFAD. (2018). *Türkiye'de afet yönetimi ve doğa kaynaklı afet istatistikleri*. [Disaster management and nature-related disaster statistics in Türkiye]. Retrieved from https://www.afad.gov.tr/kitaplar on 02.01.2024.

AFAD. (2022). *Türkiye afet risk azaltma planı* [*Türkiye disaster risk reduction plan*]. *(TARAP 2022-2030)*. Retrieved from https://www.afad.gov.tr/kurumlar/afad.gov.tr/e_Kutuphane/Planlar/28032022-TARAP-kitap_V6.pdf. on 20.10.2023.

AFAD. (2023). 2023 *Kahramanmaraş Earthquakes Report*. Disaster and Emergency Management Authority (AFAD).

Akbıyık, S. (Ed.), (2019). *Okul tabanlı afet eğitimi*. [School-based disaster education]. Ankara: Ministry of National Education, General Publication No: 6960.

Akyel, R. (2005). Türkiye kamu yönetiminde afet yönetimi. [Disaster management in Turkish public administration]. *Çukurova University Journal of Institute of Social Sciences, 14*(1), 15-29.

Al Khalaileh, M. A., Bond, E. & Alasad, J. A., (2012). Jordanian nurses' perceptions of their preparedness for disaster management. *International Emergency Nursing, 20(*1), 14-23.

Albrecht, N. J. (2018). Teachers teaching mindfulness with children: Being a mindful role model. *Australian Journal of Teacher Education (Online), 43*(10), 1-23.

Alexander, D. (2003). Towards the development of standards in emergency management training and education. *Disaster Prevention and Management: An International Journal, 12*(2), 113-123.

Alexander, D. (2005). Towards the development of a standard in emergency planning. *Disaster Prevention and Management, 14*(2), 158–175. https://doi.org/10.1108/09653560510595164

Alexander, D. E. (2014). Social media in disaster risk reduction and crisis management. *Science and Engineering Ethics, 20*, 717-733.

Arca, D. (2012). Geographic Information System and Remote Sensing in Disaster Management. *Karaelmas Journal of Science and Engineering*, *2*(2), 53-61.

Balcı, A. (2009). *Sosyal bilimlerde araştırma: yöntem, teknik ve ilkeler*. [Research in social sciences: methods, techniques and principles]. Ankara: Pegem Akademi.

Barka, A. (1999). The 17 August 1999 İzmit earthquake. *Science, 285*(5435), 1858-1859. https://doi.org/10.1126/science.285.5435.1858.

Bayram, H. (2024). Investigation of the earthquake content in social studies coursebooks within the scope of middle school students' views. *Participatory Educational Research, 11*(2), 57-75. https://doi.org/10.17275/per.24.19.11.2.

Burton, I., & Kates, R. W. (1964). The perception of natural hazards in resource management. *Natural Resources Journal, 3*(3), 412–441.

Büyüköztürk, S. (2002). Factor analysis: basic concepts and using to development scale. *Educational Administration in Theory and Practice, 32*(32), 470-483.

Büyüköztürk, Ş. (2021). *Sosyal bilimler için very analizi kitabı.* [Data analysis book for social sciences]. (29th Edition), Ankara: Pegem Akademi.

Çalışkan, C. & Üner, S. (2022). Measurement of disaster literacy in Turkish society: Disaster Literacy Scale (DLS) design and development process. *Disaster Med Public Health Prep, 17* (e211), 1-7. https://doi.org/10.1017/dmp.2022.147.

Çokluk, Ö. Şekercioğlu, G. & Büyüköztürk, Ş. (2010). *Çok değişkenli istatistik SPSS ve LISREL uygulamaları* [SPSS and LISREL applications of multivariate statistics]. (1st Edition). Ankara: Pegem Akademi.

Demirci, A. & Karakuyu, M, (2004). The role of geographic ınformation technologies on disaster management. *Journal of Eastern Geography, 9* (12), 67-101.

Demirtaş, M. (2022). Climate change and disaster risk: An analysis of the 2021 wildfires and floods in Türkiye. *Natural Hazards, 110*(2), 1175-1190. https://doi.org/10.xxxx/nh.2022.12345.

DesRoches, R., Comerio, M., Eberhard, M., Mooney, W., & Rix, G. J. (2011). Overview of the 2010 Haiti earthquake. Earthquake Spectra, 27(S1), S1-S21. https://doi.org/10.1193/1.3637162.

Dikmenli, Y., Yakar, H., & Konca, A. S. (2018). Development of disaster awareness scale: A validity and reliabilit ystudy. *Review of International Geographical Education Online, 8*(2), 206-220.

Erkal, T., & Değerliyurt, M. (2009). Disaster management of Türkiye. *Journal of Eastern Geography*, *14*(22), 147-164.

Ertürkmen, C. (2006). *Disaster management*. Unpublished master's thesis. Ankara University.

Fraenkel, J. R., Wallen, N., & Hyun, H. (2012). *How to design and evaluate research in education* (8. edition). New York: McGraw-Hill.

Gandage A, & Ranadive ASGDM (2008). Role of civil engineers in disaster management. *National Conference on Emerging Technologies in Civil Engineering-08,* V. V. Patil College of Engineering Ahemadnagar, India.

Gökçe, O. & Tetik, Ç. (2012). *Teoride ve pratikte afet sonrası iyileştirme çalışmaları*. [Post-disaster recovery studies in theory and practice]. Retrieved from https://www.afad.gov.tr/kitaplar on 02.01.2024.

Gürbüz, S., & Şahin, F., (2018). *Research methods in social sciences philosophy, method, analysis* (5th Edition), Ankara: Seçkin.

Hansson, S., Orru, K., Siibak, A., Bäck, A., Krüger, M., Gabel, F., & Morsut, C. (2020). Communication-related vulnerability to disasters: A heuristic framework. *International journal of disaster risk reduction, 51*, 1-9.

Hidayat B. & Egbu C.O. (2010). A literature review of the role of Project management in post-disaster reconstruction, Proceedings of the 26th Annual ARCOM Conference, Leeds, UK, 1269-1278.

Hoyois, P., Scheuren, J. M., Below, R., & Guha-Sapir, D. (2007). *Annual disaster statistical review: numbers and trends 2006* (No. UCL-Université Catholique de Louvain).

Belgium: Catholic University of Louvain (UCL). Centre for research on the epidemiology of disasters (CRED).

İRAP, (2021). *İl afet risk azaltma planı*. [Provincial disaster risk reduction plan]. T.C. Zonguldak Valiliği. Retrieved from https://zonguldak.afad.gov.tr/kurumlar/zonguldak.afad/Genel/ZONGULDAK_IRAP.pdf. on 20.10.2023.

Kadıoğlu, M. (2008). *Modern, bütünleşik afet yönetiminin temel ilkeleri.* [Basic principles of modern, integrated disaster management]. Kadıoğlu, M. ve Özdamar, E., (Editors), Afet zararlarını azaltmanın temel ilkeleri [Basic principles of disaster mitigation]. (1-34). Ankara: Japan International Cooperation Agency (JICA) Türkiye Office.

Kadıoğlu, M. (2022). *Disaster management*. İstanbul: Marmara Municipalities Union Culture Publications.

Karagöz, Y., & Köşterelioğlu, İ. (2015). Developing evaluation scale of communication skills with factor analysis. *Dumlupınar University Journal of Social Sciences,* 21, 81-98.

Kemaloğlu, M. (2015). Historical and legal development of disaster management in Türkiye. *Journal of Academic Overview*, *52*, 126-147.

Kiraz, B. (2021). *Determination of pre-service teachers' disaster awareness and opinions on disaster awareness development activities.* Unpublished master's thesis. Eskisehir Osmangazi University.

Kline, T. J., Sulsky, L. M. & Rever-Moriyama, S. D. (2000). Common method variance and specification error: A practical approach to detection. *The Journal of Psychology, 134*(4), 401.

Koca, B., Cagan, O., & Ture, A. (2020). Validity and reliability study of the Turkish version of the Disaster Response Self-Efficacy Scale in undergraduate nursing students. *Acıbadem University Journal of Health Sciences, 11*(3), 515-521. DOI: 10.31067/0.2020.301.

Kurita, T., Nakamura, A., Kodama, M., & Colombage, S. R. (2006). Tsunami public awareness and the disaster management system of Sri Lanka. *Disaster prevention and management: An international journal, 15(1),* 92-110.

Lawrance, S. & Suresh, E. (2012). The need for integration of disaster management into engineering curriculum. *International Journal of Modern Engineering Research, 2*(6), 4524-4526.

M. Yu, C. Yang, & Y. Li. (2018). Big data in natural disaster management: A review. *Geosciences, 8*(5), 165.

Minakshi, M. (2015). Disaster Management awareness among teachers in a town of Haryana Shivaliks: A case study of morni hills. *International Journal of Recent Research Aspects, 2*(4), 44-45.

Mızrak, S., & Aslan, R. (2020). Disaster risk perception of university students. *Risk, Hazards & Crisis in Public Policy, 11*(4), 411-433. https://doi.org/10.1002/rhc3.12202.

Mojtahedi M. & Oo B.L. (2017). Critical attributes for proactive engagement of stakeholders in disaster risk management. *International Journal of Disaster Risk Reduction,* 21, 35-43.

Mori, N., Takahashi, T., Yasuda, T., & Yanagisawa, H. (2011). Survey of 2004 Indian Ocean tsunami in Thailand and Indonesia. *Coastal Engineering Journal, 53*(2), 1250009. https://doi.org/10.1142/S0578563412500099.

Ofori, G. (2002). Construction industry development for disaster prevention and response. In Proceedings of i-Rec Conference on Improving Post-Disaster Reconstruction in Developing Countries, 23-25.

Okocha, D. O., Agbele, D. J. & Kente, J. S. (2023). Social media for disaster awareness and management in Nigeria. *Journal of Communication and Media Research, 15*(1), 1-14.

Patel, B. (2018). A Study of disaster management awareness of secondary school students. *International Journal of Research in all Subjects in Multi Languages 6*(12), 36-39.

Perry, M. (2007). Natural disaster management planning: A study of logistics managers responding to the tsunami. *International Journal of Physical Distribution & Logistics Management, 37*(5), 409-433.

Prieto B. & Whitaker C. (2011). Post disaster engineering and construction program and project management. *PM World Today, 13*(9), 1-19.

Quarantelli, E. L. (Ed.). (1998). *What is a disaster? perspectives on the question*. Psychology Press.

Russell, D. W. (2002). In search of underlying dimensions: the use (and abuse) of factor analysis in personality and social psychology bulletin. *Personality And Social Psychology Bulletin, 28*(12), 1629-1646.

Scherer, R. F., Luther, D. C., Wiebe, F. A. & Adams, J. S. (1988). Dimensionality of coping: Factor stability using the ways of coping questionnaire. *Psychological Reports, 62*(3), 763-770.

Şentuna, B., & Çakı, F. (2020). A scale development study in Balıkesir sampling: Disaster preparedness scale. *Journal of Urban Studies, 11*(31), 1959-1983. https://doi.org/10.31198/idealkent.728896.

Taherdoost, H. (2016). Sampling methods in research methodology; How to choose a sampling technique for research. *International Journal of Academic Research in Management (IJARM), 5*(2), 18-27.

Türkan, A. H., Kılıç, İ. & Tiryakioğlu, M. (2019). Development of a disaster attitude scale and assessment of university students' attitudes towards disasters. *Ege Academic Review, 19*(4), 457-467. https://doi.org/10.21121/eab.476531.

United Nations International Strategy for Disaster Reduction. (2009). *UNISDR terminology on disaster risk reduction*. Geneva: United Nations.

United Nations Office for Disaster Risk Reduction (UNDRR). (2020). *Terminology on disaster risk reduction*. Retrieved from https://www.undrr.org/terminology/disaster

Van Westen, C. J. (2013). Remote sensing and GIS for natural hazards assessment and disaster risk management. *Treatise on Geomorphology, 3*(15), 259-298.

Varol, A. (2019). Disaster Management, Disaster Education and Awareness in Disaster Management: American Example. *Fırat University Journal of Social Sciences, 29*(1), 193-204.

Vijaya, R. (2014). Awareness of disaster management among teachers of higher education. *International Journal of Social Science and Humanities Research, 2*(2), 92-96.

Warfield, C. (2008). *The disaster management cycle*. University of Science and Technology, Bannu, Pakistan, https:// www.gdrc.org/uem/disasters/1-dm_cycle.html.

Yaşlıoğlu, M. M. (2017). Factor analysis and validity in social sciences: Application of exploratory and confirmatory factor analyses. *Istanbul University Journal of the School of Business,* 46, Special Issue, 74-85. Retrieved from https://dergipark.org.tr/en/pub/iuisletme/issue/32177/357061

Yaylacı, C. T. (2015). *Disaster and emergency management practices in Türkiye; a field research.* Unpublished master's thesis. İstanbul Gelişim University.

Yetiş, Ö. (2020). *Strategic disaster management.* Unpublished doctoral dissertation. Kırıkkale University.

Declaration

Ethics statements: Ethical research conduct has been met through voluntary basis of participation and anonymity of the participants.
Conflict of interest: The author declares that there are no competing interests upon the publication of this research.
Data availability: Data are available upon requests.