Received: 21 February 2024 | Revised: 22 March 2024 | Accepted: 11 July 2024

DOI: 10.1111/phn.13380

PHN PUBLIC HEALTH NURSING WILEY

NURSING AND HEALTH POLICY PERSPECTIVE

The disaster literacy level of society, opinions on disaster management services, and related factors: A case from a province in Turkiye

Eylul Gülnur Erdogan RN, PhD, Assist. Prof.[1] | Senay Sermet Kaya RN, PhD, Assist. Prof.[2]

[1]Department of Public Health Nursing, Faculty of Health Sciences, Bilecik Seyh Edebali University, Bilecik, Turkiye

[2]Department of Nursing, Faculty of Health Sciences, Nevsehir Hacı Bektas Veli University, Nevsehir, Turkiye

Correspondence
Eylul Gülnur Erdogan, Department of Public Health Nursing, Faculty of Health Sciences, Bilecik Seyh Edebali University, Bilecik, Turkey.
Email: eylulgulnurerdogan@gmail.com

Abstract

Objective: This study aimed to investigate individuals' disaster literacy levels, their thoughts on disaster management services, and related factors.

Method: The descriptive research was conducted with a total of 480 individuals between the ages of 18 and 60 living in a province in the first-degree earthquake zone in Turkey. The data were collected with the Disaster Literacy Scale and the Disaster Management Services Evaluation Form.

Results: In this study, it was found that more than half of the participants had inadequate/moderate disaster literacy. The total disaster literacy score and all subscale scores were found to be higher in individuals who had an earthquake kit at home, had an emergency plan, and had received disaster-related training ($p < .05$). The majority of the participants found the services provided for disaster management inadequate or very inadequate.

Conclusions: In this study, it has been found that a significant portion of the society lacks the desired level of disaster literacy, and the services provided for disasters are deemed insufficient therefore, there is a need for multi-disciplinary national prevention programs to enhance disaster literacy and preparedness in the community, as well as urgently supporting policies to improve disaster-related services. Additionally, due to their comprehensive knowledge of the general structure of society, public health nurses need to play an active role in disaster preparedness and increasing disaster literacy levels.

KEYWORDS
disaster, disaster literacy, disaster management, services, society

1 | BACKGROUND

A disaster is a condition that requires national or international assistance, causing physical, economic, social, or environmental losses that the affected group or society cannot cope with using their own resources (Genc et al., 2022). Disasters may lead to large-scale physical and economic losses and significant social and psychological destruction (Altun, 2018). According to the International Emergency Events

Database (EM-DAT), there were 30,704 deaths and $223.8 billion of economic losses worldwide due to disasters in 2022 (EM-DAT, 2023).

Türkiye is a risky country in terms of disasters due to its location on Earth (UNDP, 2016). Many people have lost their lives due to natural disasters in Türkiye for the last 70 years (ITU, 2023). During the February 6 earthquakes (2023), which were recorded as the second and third largest earthquake in Türkiye (ITU, 2023; Ozer, 2023) and affected 11 provinces, more than 50,000 people died, and nearly 301,000 houses and workplaces were destroyed/moderately-heavily damaged (SBO 2023).

From past to present, every country has made various plans to minimize the impact of disasters, formed communities for effective intervention, and set regulations (Akpınar & Ceran, 2020). Disaster preparedness has many components, such as evacuation plans, early warning systems, storage of necessary materials, and studies on raising social awareness (Sutton & Tierney, 2006). Concerning social awareness with a wide impact on disaster management, the term "disaster literacy," whose importance has increased in recent years and which is a new concept, has emerged (Calıskan & Uner, 2023). This concept represents a good starting point for individuals and society to take action in order to reduce disaster-related risks and mitigate damage (Brown, Haun & Peterson, 2014; Calıskan & Uner, 2021; Kimura et al., 2017). Disaster literacy is the process of making correct and conscious decisions as a result of a detailed understanding, analysis, synthesis, and evaluation of a disaster problem that an individual has encountered or may encounter (Sozcu & Aydınozu, 2019). Individuals with high disaster literacy levels know which hazards pose problems for themselves, their families and society, the factors affecting these hazards and how to deal with them (Chu et al., 2018). Hence, it is essential that all individuals in society have high disaster literacy levels.

There are numerous studies in the literature on disaster preparedness and disaster management at the national and international levels (Amini et al., 2023; Pollack, 2020; Willson, FitzGerald & Lim, 2021). Nevertheless, it is remarkable that there are few studies on disaster literacy (Ajar & Ronggowulan, 2022; Genc et al., 2022; Zhang et al., 2021). These studies have reported inadequate/moderate levels of disaster literacy (Ajar & Ronggowulan, 2022; Genc et al., 2022; Zhang et al., 2021). Therefore the present study was planned to determine the disaster literacy level of society and related factors. Furthermore, the opinions of society about the adequacy of the services provided for disasters were evaluated.

The research questions were determined as follows;

- What are the disaster literacy levels of individuals aged between 18 and 60 who live in a first-degree disaster area?
- Do the disaster literacy levels of individuals aged between 18 and 60 who live in a first-degree disaster area differ by socio-demographic characteristics?
- Do the disaster literacy levels of individuals aged between 18 and 60 who live in a first-degree disaster area differ by their disaster-related characteristics?
- How are disaster management services delivered in our country according to individuals aged between 18 and 60 who live in a first-degree disaster area?

2 | METHOD

2.1 | Population and sample of the study

The population of this descriptive study comprises 36,585 individuals aged between 18 and 60 who live in 8 neighborhoods in the center of Bilecik city. The sample size was determined to be 381 individuals using a known formula for sample size calculation ($n = Nt^2 .p.q/d^2 2(N-1)+t^2 .p.q$) with a margin of error of 5% and a confidence interval of 95%. A stratified sampling method was employed in participant selection, with participants being stratified based on the neighborhoods they reside in. Simple random sampling was utilized to select participants from each stratum, resulting in a total of 480 individuals being reached. Inclusion criteria for the study were being between 18 and 60 years old, volunteering to participate in the research, and not encountering any difficulties in completing the survey

2.2 | Data collection

The data were collected face-to-face from randomly selected individuals in the relevant neighborhoods using the Personal Information Form, Disaster Literacy Scale, and Disaster Management Services Evaluation Form.

2.3 | Data collection forms

2.3.1 | Personal information form

The form was developed by the researchers in line with the literature (Genc et al., 2022; Zhang et al., 2021) and includes 16 questions about individuals' socio-demographic characteristics (age, gender, marital status, education, etc.) and disaster-related knowledge and experiences (disaster experience, following disaster news, earthquake kit preparation, etc.).

2.3.2 | Disaster literacy scale (DLS)

The scale developed by Calıskan and Uner (2023) to evaluate disaster literacy in individuals aged 18–60 is a five-point Likert scale and comprises 61 items. The conceptual framework includes four disaster-related dimensions (mitigation, preparedness, response, and recovery) and the processes of obtaining information regarding disaster-related decision-making and practices (access, understanding, appraisal, and application). The total score that can be received on the scale is 61–

305, and the disaster literacy level increases with the increasing score. The total score is standardized between 0 and 50 for ease of calculation. A score of 0 to <30 points indicates inadequate, a score of 30 to <36 points moderate, a score of 36 to <42 points adequate, and a score of 42–50 points means excellent disaster literacy. Cronbach's alpha coefficient for the internal consistency of the whole scale is $\alpha = 0.954$. Cronbach's alpha for the mitigation dimension was $\alpha = 0.874$, preparedness Cronbach's alpha was $\alpha = 0.860$, response Cronbach's alpha was $\alpha = 0.831$ and recovery Cronbach's alpha was $\alpha = 0.883$. Cronbach's alpha value was found to be 0.94 in this study.

2.3.3 | Disaster management services evaluation form (DMSEF)

The above-mentioned form was developed by the researchers based on the literature for individuals to evaluate disaster management-related services (before and after the disaster) in Turkey (Calıskan & Uner, 2023; Inal, Kocagoz & Turan, 2012). The form includes four 5-point Likert questions (1 = very inadequate, 2 = inadequate, 3 = moderate, 4 = adequate, 5 = very adequate) (Risk analysis and mitigation, disaster preparedness, rescue and first aid, and recovery and reconstruction). The total score varies between 4 and 20, and the subscale scores vary between 1 and 5. An increase in the score means that the participant finds disaster management services more qualified. Cronbach's alpha (α) value was determined as 0.89.

2.4 | Ethical considerations of the study

Before the study, permission was obtained from the ethics committee of the university (Number: E-54674167-050.01.04-179449 Decision No: 5), and neighborhood mukhtars were informed about the study. Before starting the survey, the participants were informed about the study, and their consent was acquired.

2.5 | Analysis of study data

SPSS 23.0 (Statistical Package of Social Sciences) package program was used to evaluate the data. Number (n), percentage (%), mean ($\bar{x} \pm$ sd), median, and 25th and 75th percentile values (M [Q25-Q75]) were used for descriptive characteristics. The data distribution were evaluated with the Kolmogorov-Smirnov test. Continuous variables were compared by the Mann-Whitney U and Kruskal-Wallis tests. The significance level was accepted as $p < .05$.

3 | RESULTS

The participants' mean age was 27.4 ± 9.39, 56.5% were female, 49% had income equal to their expenses, and 51.2% were university graduates. It was revealed that 40.8% of the participants had previous disaster experience, and 42.9% had experienced losses (material, spiritual, etc.) due to disaster. It was found that 73.3% of the participants did not have an earthquake kit at home, 67.5% did not have a family emergency plan, and 52.9% did not have earthquake insurance. Furthermore, 89.2% of the participants had not received any disaster-related training. Of the participants, 26.5% had inadequate disaster literacy, 26.5% had moderate disaster literacy, 35.2% had adequate disaster literacy, and 11.9% had excellent disaster literacy (Table 1).

The participants' DLS total mean score was 33.7 ± 7.49, and the mitigation, preparedness, response, and recovery subscale scores varied between 32.9 ± 8.92 and 35.4 ± 8.26. The Disaster Management Services Evaluation Form total mean score was 10.5 ± 4.30 out of 20, and the subscale scores varied between 2.34 ± 2.68 (Table 2). Considering the scale scores in terms of some characteristics (Table 3), there was a difference between the DLS total and recovery subscale scores in terms of only age among socio-demographic characteristics ($p < .05$). The DLS total and all sub-dimension scores of those who have earthquake kits at home, emergency plans, and disaster-related education are higher ($p < .05$) (Table 4). Of the participants, 56.8% found services provided for risk mitigation, 58.5% for disaster preparedness, 44.8% for rescue and first aid, and 42.9% for recovery and reconstruction as inadequate and very inadequate (Table 5).

4 | DISCUSSION

In this research conducted to examine the disaster literacy level, evaluations of disaster management services, and associated factors of individuals aged 18–60 living in a province located in the primary earthquake zone, it was determined that participants had a "limited" level of disaster literacy. Additionally, emphasis is placed on the change in disaster literacy level according to factors such as age, taking concrete measures against earthquakes (having an earthquake kit at home, emergency plan), and having disaster-related education. Another notable result is that a significant portion of individuals find the disaster management services provided in our country to be "very inadequate" or "inadequate."

In our study, it was determined that the participants had a "limited" level of disaster literacy. In the literature, there are results in international studies on disaster literacy indicating that the general disaster literacy level is low or partially adequate (Ajar & Ronggowulan, 2022; Zhang et al., 2021). In Turkey, although results indicate that individuals' disaster literacy levels are inadequate/moderate (Genc et al., 2022; Sozcu & Aydınozu, 2019), it is also possible to encounter studies reporting high disaster literacy levels (Demirdelen & Cakıcı, 2021; Turker & Sozcu, 2021). As seen in the relevant studies, participants' disaster literacy levels vary, and places at risk for disasters should be evaluated separately. Moreover, according to the disaster literacy results obtained, it is understood that educational activities for society should be planned and support systems should be established to transform the learned knowledge into behavior.

TABLE 1 Distribution of individuals by their socio-demographic and disaster-related characteristics ($n = 480$).

Characteristics	*n*	(%)
Gender		
Female	271	56.5
Male	209	43.5
Age (Mean ± SD) 27.4 ± 9.39		
20–29	361	75.2
30–39	57	11.9
40–49	44	9.2
50–60	18	3.8
Marital status		
Married	127	26.5
Single	353	73.5
Income status		
Income less than expenses	165	34.4
Income equal to expenses	235	49.0
Income more than expenses	80	16.7
Educational status		
Middle school and below	40	8.3
High school	161	33.5
University	246	51.2
Master's degree/PhD	33	6.9
Occupation		
Student/graduate job seeker	208	43.3
Other	272	56.7
Disaster experience		
Yes	196	40.8
No	284	59.2
Status of experiencing loss (material, spiritual, other)		
Yes	206	42.9
No	274	57.1
Status of following disaster-related news (newspapers, television, social media, etc.)		
Yes	444	92.5
No	36	7.5
Keeping an earthquake kit/survival kit at home		
Yes	128	26.7
No	352	73.3
Having a family emergency plan		
Yes	156	32.5
No	324	67.5
Having earthquake insurance		
Yes	226	47.1
No	254	52.9
Status of having received disaster-related training		
Yes	52	10.8
No	428	89.2
Disaster literacy level according to the DLS		
0–29 inadequate	127	26.5
30–35 moderate	127	26.5
36–41 adequate	169	35.2
42–50 excellent	57	11.9

TABLE 2 The DLS and the DMSEF total and subscale scores.

Characteristics	X ± SD	(Min–Max)	Median
DLS Total	33.7 ± 7.49	(5.33–50.0)	34.6
Mitigation	33.1 ± 8.63	(5.47–50.0)	34.5
Preparedness	33.6 ± 7.94	(5.47–50.0)	34.3
Response	35.4 ± 8.26	(3.85–50.0)	36.5
Recovery	32.9 ± 8.92	(0.0–50.0)	33.3
DMSEF Total	10.5 ± 4.30	(4–20)	10.0
Mitigation	2.34 ± 1.20	(1–5)	2.00
Disaster preparedness	2.36 ± 1.23	(1–5)	2.00
Rescue and first aid	2.68 ± 1.24	(1–5)	3.00
Recovery and reconstruction	2.76 ± 1.24	(1–5)	3.00

Abbreviations: Min-Max, Minimum-Maximum values; SD, Standard deviation; X, Mean.

While the study found no significant difference in individuals' disaster literacy levels according to their gender, marital status, income status, education level, and occupation, a significant difference according to age was revealed. Similar to our study, some studies have reported a significant difference between age and disaster literacy level (Bulut, 2023; Genc et al., 2022; Sozcu & Aydınozu, 2019). Whereas the disaster literacy level was the highest in the young adult age group (40–49), it was the lowest in the middle age group (50–60) in our study. When examined in terms of other socio-demographic variables, some studies in the literature have determined that the disaster literacy level does not vary by gender (Fadilah et al., 2020; Genc et al., 2022; Seyihoglu et al., 2021; Turker & Sozcu, 2021). Unlike the above-mentioned results, some studies in the literature have revealed that disaster literacy levels vary by education (Chung & Yen, 2016; Sozcu & Aydınozu, 2019) and gender (Ku & Li, 2017; Yusuf et al., 2021) ($p < .05$). These results stress that the age group is a factor that should be considered in disaster literacy initiatives. Additionally, it is thought that there is a need for more studies on the relationship of gender and other socio-demographic factors with disaster literacy.

TABLE 3 The DLS total and subscale scores according to socio-demographic characteristics.

Characteristics	DLS				
	Total M (Q_{25}/Q_{75})	Mitigation M (Q_{25}/Q_{75})	Preparedness M (Q_{25}/Q_{75})	Response M (Q_{25}/Q_{75})	Recovery M (Q_{25}/Q_{75})
Gender					
Female	34.6 (29.6–37.9)	33.8 (28.6–38.9)	34.3 (29.6–38.2)	36.5 (30.7–41.3)	34.1 (27.0–38.3)
Male	34.6 (29.7–38.9)	34.5 (29.4–38.9)	34.3 (28.9–39.0)	36.5 (30.7–40.39)	33.3 (26.6–39.1)
Z/*p*	−0.421/.673	−1.079/.281	−1.199/.843	−0.019/.985	−0.258/.796
Age					
20–29	34.6 (29.7–38.5)[a]	34.55 (28.6–38.9)	34.3 (28.9–39.0)	36.5 (30.7–41.3)	33.3 (28.3–39.1)[a]
33–39	35.8 (29.3–39.2)[ab]	35.2 (27.9–38.9)	35.9 (30.4–39.8)	37.5 (29.8–41.3)	34.1 (25.8–39.1)[ab]
40–49	34.7 (30.7–37.2)[ab]	33.8 (29.0–38.2)	33.2 (30.0–37.5)	36.0 (33.1–40.3)	34.5 (28.7–38.3)[ab]
0–60	27.8 (20.6–34.9)[b]	30.5 (17.6–31.6)	28.1 (22.6–35.1)	29.8 (21.1–37.5)	25.8 (17.5–34.1)[b]
X^2/*p*	7.95/**.047**	6.437/.092	6.67/.83	6.38/.094	8.55/**.036**
Marital status					
Married	34.5 (28.4–37.2)	33.8 (27.9–37.5)	33.2 (28.9–37.5)	35.5 (30.7–40.3)	33.7 (25.0–37.5)
Single	34.6 (29.9–38.9)	34.5 (28.6–38.9)	34.3 (28.9–39.0)	36.5 (30.7–41.3)	33.3 (28.3–39.1)
Z/*p*	−1.456/.145	−1.462/.144	−1.221/.222	−1.266/.205	−1.626/.103
Income status					
Income less than expenses	34.0 (29.3–37.7)	34.5 (27.2–38.9)	32.8 (28.1–37.5)	35.5 (29.8–40.3)	32.5 (27.5–38.3)
Income equal to expenses	34.6 (29.5–38.0)	33.8 (28.6–38.2)	34.3 (28.9–38.6)	35.5 (30.7–41.3)	34.1 (26.2–39.1)
Income more than expenses	36.0 (30.7–40.4)	35.6 (29.4–40.4)	36.7 (30.4–40.2)	38.4 (32.6–42.7)	35.4 (29.1–40.8)
X^2/*p*	4.33/.115	2.008/.366	5.24/.073	5.48/.064	4.46/.10
Educational status					
Middle school and below	34.5 (30.7–37.5)	34.1 (29.4–37.1)	34.3 (30.8–37.8)	35.0 (32.2–38.9)	34.1 (28.7–39.1)
High school	33.6 (29.7–38.1)	33.0 (28.6–38.2)	34.3 (28.9–38.2)	35.5 (30.7–40.3)	33.3 (27.5–38.3)
University	35.2 (29.3–38.3)	34.5 (28.6–38.9)	34.3 (29.6–39.0)	37.5 (30.7–41.3)	34.1 (26.6–39.1)
Master's degree and above	32.3 (27.0–40.3)	35.2 (26.4–41.1)	32.0 (27.3–41.4)	35.5 (29.8–42.3)	34.1 (25.8–39.1)
X^2/*p*	1.35/.71	2.310/.51	0.392/.92	3.978/.264	0.865/.834
Occupation					
Student	34.0 (29.8–38.1)	33.8 (28.6–38.2)	33.9 (29.6–38.2)	35.5 (31.2–40.3)	33.3 (28.7–38.7)
Other	34.8 (29.0–38.6)	34.5 (29.4–38.9)	34.3 (28.1–39.0)	36.5 (30.7–41.3)	34.1 (26.6–39.1)
Z/*p*	−0.032/.974	−0.473/.636	−0.456/.648	−0.456/.678	−0.960/.337

Note: Z: Mann-Whitney U test, X^2: Kruskal-Wallis. [a,b,c]: The same letter indicates that there is no difference between the groups. Bold values indicate statistically significant values at $p < .05$.

Disaster literacy is an important factor in society's preparedness for disasters (Asshiddiqi et al., 2021).

In our study, individuals who had earthquake kits at home and made emergency plans were found to have higher disaster literacy scores. In other words, individuals with higher disaster literacy had completed some preparations for disasters. This is an expected result. Additionally, individuals who received disaster-related education in the study were found to have higher disaster literacy scores. Similar results have been found in community studies conducted on different groups (Bulut, 2023; Genc et al., 2022; Sozcu & Aydınozu, 2019). These findings emphasize the importance of disaster literacy and, at its core, "disaster education," in earthquake preparedness. Japan can be considered a good example in terms of disaster literacy. It is known that in the country, which is described as a seismic country worldwide, the coverage of disaster intervention knowledge is close to 100% (Xu et al., 2014). The reason for this is that Japan regularly implements annual training programs (Shiroshita & Manyena, 2011) and incorporates disaster self-efficacy education into school curricula (Shiwaku, 2009). Therefore, education aimed at creating awareness about disasters at an early age is crucial for reducing disaster risk

In Türkiye, disaster-related services are provided within the framework of an integrated disaster management system. This system comprehensively encompasses pre-disaster risk and post-disaster crisis management, including planning and implementation phases involving

TABLE 4 The DLS total and subscale scores according to disaster-related characteristics.

Characteristics	DLS				
	Total M (Q_{25}/Q_{75})	Mitigation M (Q_{25}/Q_{75})	Preparedness M (Q_{25}/Q_{75})	Response M (Q_{25}/Q_{75})	Recovery M (Q_{25}/Q_{75})
Status of experiencing a disaster					
Yes	34.6 (29.3–38.6)	34.5 (28.6–38.9)	34.3 (28.9–39.8)	36.5 (30.7–41.3)	34.1 (27.5–38.3)
No	34.5 (29.8–38.1)	34.5 (28.6–38.9)	34.3 (28.9–38.2)	36.5 (31.2–41.3)	33.3 (26.6–39.1)
Z/*p*	−0.346/.729	−0.146/.884	−0.797/.425	−0.322/.747	−0.318/.751
Status of experiencing loss in a disaster					
Yes	34.8 (29.3–38.9)	34.5 (28.6–38.9)	34.3 (28.9–39.8)	36.5 (30.7–41.3)	34.1 (27.5–39.1)
No	34.4 (29.9–38.1)	34.5 (28.6–38.9)	34.3 (28.9–38.2)	36.0 (31.7–40.3)	33.3 (26.6–38.3)
Z/*p*	−0.700/.484	−0.437/.662	−0.978/.328	−0.619/.536	−0.768/.443
Status of following disaster-related news (newspapers, television, social media, etc.)					
Yes	34.6 (29.3–38.5)	34.5 (28.6–38.9)	34.3 (28.9–39.0)	36.5 (30.7–41.3)	34.1 (26.6–39.1)
No	33.5 (31.3–36.7)	35.2 (30.1–37.8)	32.8 (28.9–36.7)	35.5 (32.2–38.9)	32.9 (30.0–37.5)
Z/*p*	−0.442/.658	−0.226/.821	−1.043/.297	−0.995/.320	−0.287/.774
Do you keep an earthquake kit/survival kit at home?					
Yes	35.9 (31.3–38.9)	35.2 (30.1–40.4)	35.1 (31.2–39.4)	37.5 (32.6–41.3)	35.0 (30.0–40.0)
No	34.0 (29.3–37.7)	33.8 (28.6–38.2)	33.5 (28.1–38.2)	35.5 (30.7–40.3)	32.5 (26.6–38.3)
Z/*p*	−2.719/**.007**	−2.698/**.007**	−2.255/**.024**	−2.274/**.023**	−2.374/**.018**
Do you have a family emergency plan in your home?					
Yes	35.4 (30.9–39.9)	35.2 (29.0–40.4)	35.9 (30.8–39.8)	37.5 (32.6–42.3)	35.0 (29.1–40.8)
No	34.1 (29.3–37.5)	33.8 (28.6–38.2)	32.8 (28.1–37.5)	35.5 (30.7–40.3)	32.5 (26.6–38.3)
Z/*p*	−2.754/**.006**	−2.264/**.024**	−3.051/**.002**	−2.448/**.014**	−2.558/**.011**
Earthquake insurance					
Yes	35.4 (29.9–38.9)	34.9 (29.4–38.9)	35.1 (29.6–39.0)	36.5 (30.7–41.3)	34.1 (26.6–40.0)
No	33.8 (29.3–37.5)	33.0 (28.6–38.2)	34.3 (28.9–38.2)	36.0 (30.7–40.39	32.5 (26.6–38.3)
Z/*p*	−1.579/.114	−1.671/.095	−1.104/.270	−0.992/.321	−1.070/.285
Status of having received disaster-related training					
Yes	36.0 (31.5–40.1)	35.2 (30.5–40.4)	35.9 (31.2–40.6)	38.4 (32.6–42.3)	35.0 (29.5–40.8)
No	34.4 (29.3–37.9)	33.8 (28.6–38.2)	33.5 (28.9–38.2)	35.5 (30.7–40.3)	33.3 (26.6–38.3)
Z/*p*	−2.486/**.013**	−2.124/**.034**	−2.782/**.005**	−2.015/**.044**	−1.989/**.047**

Note: Z: Mann-Whitney U test, X^2: Kruskal-Wallis, bold values indicate statistically significant values at $p < .05$.

risk reduction, preparedness, response, rescue, first aid, early recovery, and reconstruction. (Kupelioglu & Coskun, 2023). Recent disasters have highlighted the inadequacy of current approaches. In Turkey, rapid population growth, urbanization, and construction processes can result in adverse effects when disasters strike. Uncontrolled and rapid urbanization increases disaster risks and leaves cities vulnerable to disasters (Ozdemir, 2023). Additionally, studies revealing the society's level of knowledge, awareness, and preparedness for disasters suggest that the services provided in this regard are inadequate (Genc et al., 2022; Sahin, Lamba, & Oztop, 2018). Similarly, in our study, the disaster literacy level of the community was not found to be at the desired level, and a significant portion expressed that they found the disaster management services provided in our country to be "very inadequate" or "inadequate." The frequency and impact of disasters in the last 20 years indicate the need to question the functionality of traditional disaster management models. It is recommended to take into account the study results when planning initiatives and designing policies aimed at ensuring the community's safety against disasters, improving the quality of preventive services, and ensuring effective crisis management.

5 | LIMITATIONS

This study is one of the few examining the level of disaster literacy in the community. While this is a strength of the study, it has also created limitations in discussing the results. Conducting the study in only one city limits the generalizability of the findings, although being

TABLE 5 Distribution of individuals according to the scores they gave to existing disaster management services.

	1 point *n* (%)	2 points *n* (%)	3 points *n* (%)	4 points *n* (%)	5 points *n* (%)
DMSEF					
Risk mitigation The implementation and maintenance of engineering measures aimed at mitigating disaster risks and reducing disaster damage, such as selecting suitable locations for construction and using appropriate materials.	149 (31.0)	124 (25.8)	139 (29.0)	29 (6.0)	39 (8.1)
Disaster preparedness Pre-planning of all needs that may be required in case of a possible disaster (post-disaster shelter, food, supply of hygienic materials, etc., intervention and first aid services, etc.)	147 (30.6)	134 (27.9)	115 (24.0)	46 (9.6)	38 (7.9)
Rescue and first aid Intervention in incidents, search and rescue operations, communication, transportation, damage assessment, removal of collapsed buildings, measures against fire, explosion, and prevention of infectious diseases, etc. services.	103 (21.5)	112 (23.3)	147 (30.6)	68 (14.2)	50 (10.4)
Recovery and reconstruction (In disaster-affected areas, services covering all necessary activities for communication, transportation, basic needs, electricity, sewage, education, construction of permanent housing, and restoration of economic and social life.)	93 (19.4)	113 (23.5)	143 (29.8)	78 (16.3)	53 (11.0)

Note: 1 points = very inadequate, 2 points = inadequate, 3 points = moderate, 4 points = adequate, 5 points = very adequate.

conducted in a city located in a primary earthquake zone can be considered a strength.

6 | CONCLUSION

This study revealed that more than half of the participants had inadequate or moderate disaster literacy levels. Disaster literacy levels were higher in individuals who were young adults, took concrete preparedness measures against earthquakes (such as having an earthquake kit at home and having an emergency plan), and had received disaster-related training. Furthermore, most participants found the services provided regarding disaster management to be inadequate or very inadequate. These results stress the urgency of conducting education and awareness-raising activities to increase the disaster literacy level of society and, indirectly, their disaster preparedness levels. Additionally, the data on the disaster literacy level of society and their opinions on the adequacy of the delivered services, as revealed in the study, provide important information for service providers to re-evaluate existing approaches in disaster management and update and strengthen them based on policies. State institutions should primarily be responsible for increasing the disaster awareness of society and ensuring disaster preparedness. However, disaster preparedness requires the coordination and support of numerous disciplines. Moreover, nurses, who are among the healthcare professionals, and especially public health nurses working in the community, have significant responsibilities at all stages of disasters. Public health nurses play a key role in disaster preparedness and increasing levels of disaster literacy, as they have comprehensive knowledge about the general structure and health status of society and are experts in program planning, community evaluation, and group dynamics. Hence, it is recommended that public health nurses, who are closely acquainted with society, be included in initiatives planned to increase the disaster literacy level of society, and their knowledge and experience should be utilized.

AUTHOR CONTRIBUTIONS

Study design: Eylul Gülnur Erdogan. *Data collection*: Eylul Gülnur Erdogan. *Data analysis*: Senay Sermet Kaya. *Study supervision*: Eylul Gülnur Erdogan. *Manuscript writing*: Eylul Gülnur Erdogan, Senay Sermet Kaya. Critical revisions for important intellectual content: Eylul Gülnur Erdogan, Senay Sermet Kaya.

ACKNOWLEDGMENTS

The authors thank all participants in the present study for their generous cooperation. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CONFLICT OF INTEREST STATEMENT

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 STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ORCID

Eylul Gülnur Erdogan RN, PhD https://orcid.org/0000-0002-4770-385X

Senay Sermet Kaya RN, PhD https://orcid.org/0000-0001-7949-1727

REFERENCES

Ajar, S. B., & Ronggowulan, L. (2022). Disaster literacy level of teachers and students in secondary school: Case study in Surakarta City. Indonesia. In: IOP Conference Series: Earth and Environmental Science, (Vol. *986*, No. 1, p.012017). IOP Publishing. https://doi.org/10.1088/1755-1315/986/1/012017

Akpınar, N. B., & Ceran, M. (2020). Current Approaches about disasters and role and responsibilities of disaster nurse. *Journal of Paramedic and Emergency Health Services*, *1*(1), 28–40.

Altun, F. (2018). Economic and social ımpacts of disasters: An assessment of the example of Turkey. *Turkish Journal of Social Work*, *2*(1), 1–15.

Amini, F. F., Hidarnia, A. A., Ghofranipour, F. F., Motlagh, M. E., RahPima, A. M., & Shamspour, N. (2023). Determinants of health volunteer training in natural hazard management in Iran. *Jamba (Potchefstroom, South Africa)*, *15*(1), 1384. https://doi.org/10.4102/jamba.v15i1.1384

Asshiddiqi, M. R., Vitasari, M., & Biru, L. T. (2021). Validity of disaster E-Book to improve disaster literacy skills at junior high school. *Journal Pena Sains*, *8*(2), 79–87. https://doi.org/10.21107/jps.v8i2.12204/

Brown, L. M., Haun, J. N., & Peterson, L. (2014). A proposed disaster literacy model. *Disaster Medicine and Public Health Preparedness*, *8*(3), 267–275. https://doi.org/10.1017/dmp.2014.43

Bulut, A. (2023). Investigation of factors affecting ındividuals' disaster literacy levels with ordinal logistic regression analysis. *Journal of Disaster and Risk*, *6*(3), 691–709.

Calıskan, C., & Uner, S. (2021). Disaster literacy and public health: A systematic review and integration of definitions and models. *Disaster Medicine and Public Health Preparedness*, *15*(4), 518–527. https://doi.org/10.1017/dmp.2020.100

Calıskan, C., & Uner, S. (2023). Measurement of disaster literacy in Turkish Society: Disaster Literacy Scale (DLS) design and development process. *Disaster Medicine and Public Health Preparedness*, *17*, e211. https://doi.org/10.1017/dmp.2022.147

Chu, Y. M., Chang, T. C., Tsai, C. C., & Lin, H. L. (2018). Study of disaster prevention education for senior vocational high school sustainable campus in Taiwan. In 2018 IEEE International Conference on Advanced Manufacturing (ICAM), 418–421. IEE. https://doi.org/10.1109/AMCON.2018.8615016

Chung, S. C., & Yen, C. J. (2016). Disaster prevention literacy among school administrators and teachers: A study on the plan for disaster prevention and campus network deployment and experiment in Taiwan. *Journal of Life Sciences*, *10*, 203–214. https://doi.org/10.17265/1934-7391/2016.04.006

Demirdelen, S., & Çakıcı, A. B. (2021). Natural disasterliteracylevels of primary/secondary school teachers: The case of osmaniye province. *Gümüşhane University Journal of HealthSciences*, *10*(3), 532–541. https://doi.org/10.37989/gumussagbil.870607

Fadilah, M., Permanasari, A., Riandi, R., & Maryani, E. (2020). The level of disaster literacy of earthquake-experienced students in Mathematics and Science faculty of State University in Indonesia. *Journal of Engineering Science and Technology (JESTEC) on AASEC2019*, *(February)*, 30–38.

Genc, F. Z., Yildiz, S., Kaya, E., & Bilgili, N. (2022). Disaster literacy levels of individuals aged 18–60 years and factors affecting these levels: A web-based cross-sectional study. *International Journal of Disaster Risk Reduction*, *76*, 102991. https://doi.org/10.1016/j.ijdrr.2022.102991

Inal, E., Kocagoz, S., & Turan, M. (2012). Basic disaster consciousness and preparation levels. *Turkish Journal of Emergency Medicine*, *12*(1), 15–19. https://doi.org/10.5505/1304.7361.2012.05658

Istanbul Technical University (ITU). (2023). 6 February 2023: 04.17 Mw 7.8 Kahramanmaraş (Pazarcık, Türkoğlu), Hatay and 13.24 Mw 7.7 Kahramanmaraş (Elbistan/Nurhak-Çardak) earthquakes: Preliminary Investigation Report.

Kimura, R., Hayashi, H., Kobayashi, K., Nishino, T., Urabe, K., & Inoue, S. (2017). Development of a "disaster management literacy hub" for collecting, creating, and transmitting disaster management content to increase disaster management literacy. *Journal of Disaster Research*, *12*, 42–56. https://doi.org/10.20965/jdr.2017.p0042

Ku, W. H., & Li, M. K. (2017). A study on disaster prevention and mitigation literacy (DPML) of primary and secondary school teachers in Macao. *Macau Journal of Nursing*, *16*, 20–29. https://doi.org/10.6729/MJN.201712_16(1-2).004

Küpelioğlu, E., & Coşkun, S. (2023). *Disaster management in Turkey and the world*, TİAV Publications, ISBN: 978-625-7197-42-7 (2023).

Ozdemir, A. (2023). The role of municipalities ın disaster management. *Gümüşhane University Journal of Health Sciences*, *12*(2), 828–839. https://doi.org/10.37989/gumussagbil.1275745

Ozer, M. (2023). Education policy actions by the ministry of national education after the historical earthquake disaster on February 6, 2023 in Turkey. *Bartın University Journal of Faculty of Education*, *12*(2), 219–232. https://doi.org/10.14686/buefad.1261101

Pollack, H. A. (2020). Disaster Preparedness and Social Justice in a Public Health Emergency. *Journal of Health Politics, Policy and Law*, *45*(6), 907–920. https://doi.org/10.1215/03616878-8641457

The Strategy and Budget Office (SBO) of the Republic of Türkiye (2023). Türkiye Earthquakes Recovery and Reconstruction Assessment. Retrieved July 28, 2023, from https://www.sbb.gov.tr/wp-content/uploads/2023/03/Turkiye-Recovery-and-Reconstruction-Assessment.pdf

Sahin, Y., Lamba, M., & Oztop, S. (2018). Determınatıon of dısaster awareness and preparedness level of unıversıty students. *Journal of Civilization Studies*, *3*(6), 149–159.

Seyihoglu, A., Kartal, A., Tekbiyik, A., Vekli, S. G., & Konur, K. B. (2021). The design and implementation of a teacher training program for improving teachers' disaster literacy: interdisciplinary disaster education program (IDEP). *Problems of Education in the 21st Century*, *79*, 781–803. https://doi.org/10.33225/pec/21.79.781

Shiroshita, H., & Manyena, B. (2011). Role of safety and disaster education for building resilient communities in Japan and UK. In: North East Asia—UK International Conference and Study Tour on Adaptation for Safer Cities. Newcastle upon Tyne, UK.

Shiwaku, K. (2009). *Essentials of school disaster education: Example from Kobe, Japan*. In Shaw, R., Shiwaku, K., & Takeuchi, Y. (Eds.), Disaster management: Global challenges and local solutions (pp. 321–337). Springer.

Sozcu, U., & Aydınozu, D. (2019). Examining the natural disaster literacy levels of pre-service teachers according to some variables. *International Journal of Geography and Geography Education (IGGE)*, *40*, 79–91. https://doi.org/10.32003/iggei.566164

Sutton, J., & Tierney, K. (2006). *Disaster preparedness: Concepts, guidance, and research*. Colorado: University of Colorado, 3(1).

The International Disaster Database (EM-DAT. (2023). *2022 disasters in numbers: Climate in action*. https://www.emdat.be/categories/adsr/

Turker, A., & Sozcu, U. (2021). Examining natural disaster literacy levels of pre-service geography teachers. *Journal of Pedagogical Research*, *5*, 207–221. https://doi.org/10.33902/JPR.2021270164

United Nations Development Programme (UNDP). (2016). Resilience in SMEs: new risks, new priorities cbı turkey situation assessment report—complex emergencies and natural disasters. https://www.undp.org/tr/turkiye/publications/kobilerde-dayaniklilikyeni-riskler-yeni-oncelikler

Willson, K. A., FitzGerald, G. J., & Lim, D. (2021). Disaster management in rural and remote primary health care: A Scoping Review. *Prehospital and Disaster Medicine*, *36*(3), 362–369. https://doi.org/10.1017/S1049023X21000200

Xu, W., Li, Y., Okada, N., Takeuchi, Y., Kajitani, Y., & Shi, P. (2014). Collaborative modelling-based shelter planning analysis: a case study of the Nagata elementary school community in Kobe City, Japan. *Disasters*, *38*(1), 125–147. https://doi.org/10.1111/disa.12033

Yusuf, R., Yunus, M., Maimun, M., & Fajfi, I. (2021). Environmental Education: a correlational study among environmental literacy, disaster knowledge, environmental sensitivity, and clean-living behavior of post tsunami disaster in Aceh communities, Indonesia. *Polish Journal of Environmental Studies*, *31*, 411–425. https://doi.org/10.15244/pjoes/139327

Zhang, D., Zhu, X., Zhou, Z., Xu, X., Ji, X., & Gong, A. (2021). Research on disaster literacy and affecting factors of college students in central China. *Disaster Medicine and Public Health Preparedness*, *15*(2), 216–222. https://doi.org/10.1017/dmp.2020.33

How to cite this article: Erdogan, E. G., & Kaya, S. S. (2024). The disaster literacy level of society, opinions on disaster management services, and related factors: A case from a province in Turkiye. *Public Health Nursing*, *41*, 1135–1143. https://doi.org/10.1111/phn.13380