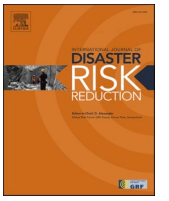
International Journal of Disaster Risk Reduction 76 (2022) 102991



Contents lists available at ScienceDirect

International Journal of Disaster Risk Reduction

journal homepage: www.elsevier.com/locate/ijdrr





Disaster literacy levels of individuals aged 18–60 years and factors affecting these levels: A web-based cross-sectional study

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ARTICLE INFO

Keywords:
Disaster
Disaster literacy
Disaster management

ABSTRACT

Turkey is a high-risk country in terms of disasters. The knowledge and attitudes of citizens are important in reducing the impact of disasters. This study aims to determine the disaster literacy levels of individuals aged 18–60 years and factors affecting these levels. A total of 2134 individuals participated in this cross-sectional study. Data were collected using the disaster literacy scale via Google Forms. Kolmogorov Smirnov, Mann–Whitney U, Kruskal Wallis, Spearman correlation, and linear regression tests were used for data analysis. The average disaster literacy score of participants was 35.00; 28.4% received an insufficient score, 24.3% a mediocre score, 24.5% a sufficient score, and 22.8% an excellent score. In the regression model created on disaster management, contrarily, the score differed depending on varied factors, such as residing in the Southeastern Anatolia region, having received disaster training, following disaster-related news, having a survival kit, and having earthquake insurance. Over 50% of the participants were found to have insufficient/mediocre levels of disaster literacy. It is concluded that the number of initiatives should increase to enhance awareness and readiness for disaster reduction and management.

1. Introduction

Disasters are unforeseen destructive events that have occurred since the beginning of the world [1]. A disaster is a circumstance that is beyond the afflicted group's or society's ability to cope using its own resources, thereby necessitating national or international aid; it leads to significant disruptions in regular life and operations by causing physical, economic, social, or environmental losses [2]. Over the last decade, over 2.6 billion people worldwide have been affected by disasters, such as earthquakes, tsunamis, landslides, heat waves, floods, or severe cold. These events have resulted in mass injuries that have the potential to exhaust local medical resources and prevent the delivery of comprehensive and definitive medical care [3].

According to the 2020 report of the Center for Research on the Epidemiology of Disasters (CRED), 396 disasters occurred worldwide in 2019. These disasters affected more than 95 million people and caused 11,755 deaths. The number of disasters that occurred in 2019 was higher than the average number of disasters that occurred in the last decade. Of all disasters that occurred in 2019, 40% were in Asia. The most lethal disaster was heat waves witnessed across Europe, followed by flood in India. Approximately 68% of the population in India was affected by flood and storm [4].

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https://doi.org/10.1016/j.ijdrr.2022.102991
Received 17 July 2021; Received in revised form 18 March 2022; Accepted 24 April 2022
Available online 29 April 2022
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Due to its tectonic, seismic, topographic, and climatic structure, Turkey is one of the countries that frequently encounter disasters, such as earthquakes. It ranks third worldwide in terms of human losses due to earthquakes and eighth in terms of the number of people affected. On average, at least one earthquake with a magnitude of 5–6 occurs in Turkey every year. The 1999 Marmara earthquake was one of the worst disasters in Turkey. The most important development since then has been the realization that it is more vital to prepare an emergency plan in advance before the earthquake rather than aid delivery after the earthquake [5]. This realization highlights the importance of disaster literacy levels of individuals.

Studies in literature that investigate the disaster literacy levels of communities address various aspects, such as disaster information literacy [6,7], disaster prevention literacy [8], disaster literacy [9,10], disaster risk literacy [1], disaster reduction literacy [11], and disaster management literacy [12]. Disaster literacy is defined as the ability of an individual to access, read, understand, and use the information necessary to make informed decisions and follow instructions in the context of mitigation, preparation, response, and recovery during a disaster [10,13]. In a study conducted by Zhang et al. [14] to determine the disaster literacy levels of university students, 79.43% of the participants stated that their families were not prepared for disasters; 96.36% of the participants suggested that there should be a campus emergency rescue team; 88.64% stated that it is important to gain information about disasters via television or the internet; and only 12.89% stated that it is important to provide courses on disasters by relevant authorities. In the same study, the total disaster literacy scale scores of university students were found to be low. Disaster literacy levels have also been investigated in several countries, such as China [11,14,15], Indonesia [16; 17], Nigeria [18], Netherlands [19]. Similar results were obtained in these countries.

In a compilation study conducted by Kanbara et al. [1], the concept of disaster risk reduction literacy was addressed. Disaster reduction literacy is the awareness, knowledge, and techniques needed to help survivors reduce disaster risks and make quick decisions on how to do so. It was stated in this compilation study that strengthening the role of societies in assessing their disaster reduction needs would more accurately benefit all individuals in these societies. A study conducted by Chung and Yen [20] aimed at determining the levels of disaster prevention literacy of school administrators and teachers; among the three dimensions of disaster prevention literacy (knowledge, attitude, and skills), individuals were most informed about the skills and least informed about knowledge. Among the priorities of the Sendai Framework for Disaster Risk Reduction 2015–2030—whose motto is "Build Back Better"—is the development and improvement of disaster preparedness for effective disaster response, rehabilitation, and reconstruction [21].

In recent years, countries worldwide and in Turkey have witnessed a significant increase in the number of disasters and the consequent loss of life and property. In addition, the rapid and excessive increase in world population, in turn, causes an increase in the loss of life and property caused by disasters. Disaster literacy is a concept that needs to be emphasized to reduce material and spiritual losses due to disasters. Individuals must not only possess knowledge about disasters but also develop attitudes toward disasters and transform these attitudes into actions. A disaster-literate person is expected to be equipped with the knowledge, attitudes, and behaviors required to face disasters, set an example for their environment, and survive such cases [7,22]. This concept constitutes a good starting point for individuals and society to take action on reduction of risks and mitigation of harm [10,12,13,18]. This study is expected to make important contributions to determine the current levels of disaster literacy in Turkey and factors affecting these levels.

The questions to which answers were sought in this study are as follows:

- Have participants experienced a disaster?
- What are the disaster literacy levels of participants?
- What are the factors affecting participants' disaster literacy levels?

2. Research method

2.1. Purpose and type

This is a cross-sectional study that determines the disaster literacy levels of individuals between the ages of 18 and 60 and the factors affecting these levels.

2.2. Population and sample

The population of the study consisted of individuals between the ages of 18 and 60 residing in Turkey. The G Power software was used to measure the statistical power, and the small effect size was found to be (0.10), in addition to a Type 1 error of 0.05, a power of 95%, and a maximum of seven groups. Based on one-way analysis of variance, the smallest sample size was calculated as 2093.

2.3. Location and characteristics

The study was conducted online. A data collection form was created on Google Drive and the link to this form was sent to the participants.

2.4. Inclusion criteria for the study

Individuals between the ages of 18 and 60 who volunteered and did not have any difficulty filling out the online questionnaire were included in the study.

2.5. Data collection tools

2.5.1. Personal information form

This form was prepared by researchers in line with the findings of the literature review [1,10,13,14,20]. It features questions regarding sociodemographic characteristics (age, gender, marital status, educational status, and occupation) and disaster experiences (having experienced a disaster or not, having any loss in a disaster or not, having a disaster plan or not, having a survival kit or not, following disaster-related news or not, having received disaster training or not, having earthquake insurance or not) of the participants.

2.5.2. Disaster literacy scale

It is a self-report scale developed by Hardworking (2020) to determine the disaster literacy levels of people aged 18–60. The conceptual framework features four dimensions (mitigation, preparedness, response, and recovery) and the information gathering processes (access, understanding, decision-making, and implementation) of disaster management. The conceptual framework of the 61-item scale consists of 16 areas. Each item can be, respectively, given the score of and identified as 1 point (1: Very difficult), 2 points

Table 1
Frequency distributions.

Sociodemographic Data	Frequency (n)	Percent (%)
Gender		
Female	1203	56.4
Male	931	43.6
Marital status		
Single	1088	51.0
Married	1046	49.0
The administrative unit of residence		
Province	1270	59.5
District	722	33.8
Town/Village	142	6.7
Region of residence		
Mediterranean region	133	6.2
Eastern Anatolia region	97	4.5
Aegean region	86	4.0
Southeast Anatolia region	146	6.8
Central Anatolia region	678	31.8
Black Sea region	761	35.7
Marmara region	233	10.9
Education status		
Literate	78	3.7
Primary/Secondary school graduate	119	5.6
High school graduate	439	20.6
Associate's degree	443	20.8
Bachelor's degree	773	36.2
Master's degree	282	13.2
Perception of monthly income level		
High	409	19.2
Medium	1366	64.0
Low	359	16.8
Disaster Experiences	**Frequency (n)**	**Percent (%)**
Experienced a disaster		
Yes	722	33.8
No	1412	66.2
Experienced a loss (property, relative, or injury) (n=716 will be subtracted)		
Yes	130	18.2
No	586	81.8
Received disaster training		
Yes	1021	47.8
No	1113	52.2
Follow disaster-related news		
Yes	1926	90.3
No	208	9.7
Have a survival kit at home		
Yes	354	16.6
No	1780	83.4
Have a family disaster emergency plan		
Yes	388	18.2
No	1746	81.8
Have earthquake insurance		
Yes	978	45.8
No	1156	54.2

(2: Difficult), 3 points (3: Undecided), 4 points (4: Easy), or 5 points (5: Very easy). The total score that can be obtained from the scale is between 61 and 305. The higher the score, the higher the disaster literacy level of the participant. For ease of calculation, the total score was standardized between 0 and 50. The scale is divided into metrics as a score of 0–<30 implies insufficient, 30–<36 implies mediocre, 36–<42 implies sufficient, and 42–50 implies excellent disaster literacy [23]. In this study, the Cronbach's alpha value of the scale was found to be 0.979.

2.6. Ethical dimension of the research

The researchers acquired approval from the Gazi University Ethics Committee (Research Code No: 2020-568), permission from scholars who created the disaster literacy scale for use in this study, and consent from all participants.

2.7. Statistical evaluation of data

The data obtained from the questionnaire were evaluated using the IBM SPSS version 22.0 software. Frequencies, percentages, mean score, standard deviation, median score, and minimum and maximum values of the data were analyzed. Normal distribution was identified using the Kolmogorov Smirnov test. The Mann–Whitney *U* test and Kruskal Wallis test were used to compare data that did not show normal distribution. Spearman correlation analysis was performed and a linear regression model was created. The significance level was taken as $p < 0.05$.

3. Results

3.1. Findings related to participants' sociodemographic characteristics and disaster experiences

Of the participants, 56.4% are women, 49% are married, and 59.5% live in the city center. The median age of the participants is 28. Of the participants, 35.7% live in the Black Sea region, 31.8% in the Central Anatolia region, 10.9% in the Marmara region, 6.8% in the Southeastern Anatolia region, 6.2% in the Mediterranean region, 4.5% in the Eastern Anatolia region, and 4% in the Aegean region. Among the participants, 33.8% had experienced a disaster before, 18.2% of whom stated that they experienced at least one type of loss of property (loss of property, loss of a relative, or injury). It was determined that 47.8% of the participants received disaster-related training, 90.3% followed disaster-related news, 16.6% had a survival kit at home, and 45.8% had earthquake insurance (Table 1).

3.2. Findings obtained from the disaster literacy scale

The mean disaster literacy score was found to be 35.0 (min: 0, max: 50). Approximately 28.4% of the participants had an insufficient level of disaster literacy, 24.3% had a mediocre level of disaster literacy, 24.5% had a sufficient level of disaster literacy, and 22.8% had an excellent level of literacy (Table 2).

The disaster literacy scale score differed by marital status ($p = 0.003$) and region of residence ($p = 0.009$). The disaster literacy scale score of participants differed by the previous disaster experience; having experienced at least one kind of loss among property loss, loss of a relative, or injury in a disaster; following disaster-related news; having a survival kit; having a family disaster plan; and having earthquake insurance ($p < 0.001$) (Table 3). The disaster literacy scale score did not differ by other parameters ($p > 0.05$).

The regression model created for disaster management was found to be statistically significant ($p < 0.001$). A one-unit increase in age causes a 0.101-unit decrease in the scale score ($p < 0.001$). In terms of the regions of residence, the scale score was found to be lower by 2,434 points among those living in the Southeastern Anatolia region ($p = 0.008$). Having received training on disasters increased the scale score by 2,233 points, following disaster-related news by 4,777 points, having a survival kit by 2,638 points, and having earthquake insurance by 1,075 points. Other variables were not found to be statistically significant. The created regression model explained 9.8% of changes in scale scores (Table 4).

4. Discussion

Disaster literacy is defined as an individual's ability to read, understand, and use the information required to make informed decisions in the context of disaster mitigation, preparedness, response, and recovery, and to follow instructions to enhance chances of survival during disaster situations [7]. This concept constitutes a good starting point for individuals and the society to reduce risks and mitigate harm [10,12,13,18]. Moreover, identifying the disaster literacy level of citizens and conducting relevant community awareness and training activities can contribute to the reduction of social vulnerability [24]. Although Koç et al. [25] claimed that the information dimension is frequently addressed in studies regarding disaster management and emphasized the requirement for studies focusing on implementation; our study is the first in Turkey that investigated disaster literacy levels, and its findings reveal that there is a need for further similar studies.

According to a study conducted by Chung and Yeng [20], 58.70% of participants had experienced a disaster and 59.11% had

Table 2
Distribution of disaster literacy scale scores by groups.

	Frequency (n)	Percent (%)
Insufficient (0–29)	607	28.4
Mediocre (30–35)	519	24.3
Sufficient (36–41)	522	24.5
Excellent (42–50)	486	22.8

Table 3
Comparisons by disaster literacy scale scores.

	Average ±SS	Median (min.–max.)		Test statistics	p
Gender					
Female	35.3 ± 8.3	35.7 (0–50)		U = 580,263	0.151
Male	34.7 ± 9.3	35 (0.6–50)			
Marital status					
Single	35.6 ± 8.6	36 (0–50)		U = 527,268	**0.003**
Married	34.4 ± 8.9	34.8 (0.6–50)			
The administrative unit of residence					
Province	35.4 ± 8.6	35.6 (1–50)		5.205	0.074
District	34.8 ± 9	35 (0–50)			
Town/Village	33.6 ± 9.4	33.3 (3.5–50)			
Region of residence					
Mediterranean Region	35.5 ± 8.7	35.7 (1–50)^{ab}		17.116	**0.009**
Eastern Anatolia Region	33.8 ± 8.3	34 (12.1–50)^{ab}			
Aegean Region	35.2 ± 8.4	35.6 (17.4–50)^{ab}			
Southeast Anatolia Region	32.9 ± 9.5	32.4 (2.9–50)^{a}			
Central Anatolia Region	35.3 ± 8.6	35.5 (2.3–50)^{b}			
Black Sea Region	35 ± 8.6	35 (0.6–50)^{ab}			
Marmara Region	36.1 ± 9.6	36.7 (0–50)^{b}			
Education status					
Literate	34 ± 10.7	36.3 (2.3–50)^{abc}		25.673	$p < 0.001$
Primary/Secondary school graduate	32.5 ± 9.8	34.2 (4.7–50)^{c}			
High school graduate	34.1 ± 9.2	34.2 (0.6–50)^{ac}			
Associate's degree	35.9 ± 8.7	36.3 (1–50)^{ab}			
Bachelor's degree	35.9 ± 8.2	35.9 (0–50)^{b}			
Master's degree	34.2 ± 8.1	34.6 (10.7–50)^{ac}			
Perception of monthly income level					
High	36.5 ± 8.4	36.5 (11.7–50)^{a}		24.387	$p < 0.001$
Medium	35.2 ± 8.4	35.5 (0–50)^{b}			
Low	32.9 ± 10	33.6 (1–50)^{c}			
Experienced a disaster					
Yes	35.1 ± 8.8	35.2 (0–50)		U = 505,142	0.733
No	35 ± 8.8	35.2 (0.6–50)			
Experienced a loss (property, relative, or injury)					
Yes	32.6 ± 9.5	33.5 (3.5–50)		U = 45,301	**0.001**
No	35.7 ± 8.5	35.9 (0–50)			
Received disaster training					
Yes	36.8 ± 8.2	37.1 (2.3–50)		U = 451,021	$p < 0.001$
No	33.5 ± 9	34 (0–50)			
Follow disaster-related news					
Yes	35.6 ± 8.5	35.9 (0–50)		U = 128,436	$p < 0.001$
No	29.9 ± 10	28.7 (2.3–50)			
Have a survival kit at home					
Yes	37.8 ± 8.4	38.3 (2.3–50)	U = 246,493	$p < 0.001$	
No	34.5 ± 8.7	34.8 (0–50)			
Have a family disaster emergency plan					
Yes	38.3 ± 8	38.6 (5.5–50)	U = 246,317	$p < 0.001$	
No	34.3 ± 8.8	34.6 (0–50)			
Have earthquake insurance					
Yes	36 ± 8.3	36.3 (2.7–50)	U = 506,575	$p < 0.001$	
No	34.3 ± 9.1	34.8 (0–50)			

χ^2 : Kruskal Wallis test result, U: Mann–Whitney *U* test result, $^{a\text{-}c}$: There is no difference between groups with the same letter.

participated in disaster prevention training programs. It was determined that the disaster literacy levels of individuals differed based on having experienced a disaster. According to the study conducted by Türker and Sözcü [26], disaster literacy levels differed in terms of disaster training history ($p < 0.001$) and disaster experience ($p = 0.02$). In a study conducted by Sözcü and Aydinözü [7], 53.03% of the participants had experienced a disaster, 57.47% of whom had experienced it recently. In addition, 44% of the participants had received disaster training and 38.58% participated in disaster-related activities. According to a study conducted by Olowoporoku [18], a majority of participants (91.4%) had experienced a disaster; however, approximately 38.9% received disaster management training. In Caliskan's [23] study, it was determined that 37.7% of the participants had experienced a disaster, and the vast majority (90% or more) had not experienced any loss (loss of property, loss of a relative, or injury) in a disaster. In the same study, 68.9% of the participants followed disaster-related news, 58.8% insured their houses against disasters, 24.0% received disaster training, 15.5% had a survival kit at home, 12.4% had a family disaster plan, and 3.5% members were members of a disaster-related nongovernmental organization. According to a study conducted in China, 80% of the participants had experienced a disaster, 26.1% received disaster training, and 75.1% had undertaken at least three among the following disaster measures: preparing a survival kit, having basic aid supplies, keeping emergency food and drinking water, storing essential medicines, and placing fire extinguishers [15]. In our study,

Table 4
Linear regression analysis results.

	β^1	Std. Error	β^2	t	p	Lower Limit	Upper Limit	Simple Correlation	Partial Correlation
(Constant)	31.554	1.433		22.025	p < 0.001	28.744	34.363		
Age	−0.101	0.019	−0.124	−5.246	p < 0.001	−0.139	−0.064	−0.106	−0.113
Gender (Male)	0.023	0.395	0.001	0.058	0.954	−0.752	0.798	−0.034	0.001
The administrative unit of residence									
Province	0.975	0.802	0.055	1.216	0.224	−0.598	2.548	0.043	0.026
District	0.528	0.812	0.029	0.651	0.515	−1.063	2.120	−0.021	0.014
Region of Residence									
Mediterranean	−0.490	0.918	−0.014	−0.534	0.594	−2.291	1.311	0.014	−0.012
Eastern Anatolia	−1.734	1.029	−0.041	−1.684	0.092	−3.753	0.285	−0.032	−0.037
Aegean	−0.597	1.064	−0.013	−0.561	0.575	−2.683	1.490	0.004	−0.012
Southeast Anatolia	−2.434	0.910	−0.070	−2.676	**0.008**	−4.218	−0.650	−0.067	−0.058
Central Anatolia	−0.396	0.647	−0.021	−0.612	0.540	−1.665	0.872	0.021	−0.013
Black Sea	−0.357	0.659	−0.020	−0.543	0.587	−1.649	0.934	−0.005	−0.012
Education status									
Primary school	−0.268	1.252	−0.007	−0.214	0.831	−2.723	2.188	−0.072	−0.005
High school	−0.582	1.041	−0.027	−0.559	0.576	−2.623	1.460	−0.055	−0.012
Associate's degree	0.833	1.037	0.039	0.803	0.422	−1.201	2.867	0.051	0.017
Bachelor's degree	0.900	1.021	0.049	0.881	0.379	−1.103	2.903	0.073	0.019
Master's degree	−1.005	1.109	−0.039	−0.906	0.365	−3.180	1.171	−0.037	−0.020
Experienced a disaster (Yes)	−0.233	0.395	−0.013	−0.589	0.556	−1.007	0.542	0.006	−0.013
Received disaster training (Yes)	2.233	0.377	0.127	5.929	p < 0.001	1.494	2.971	0.186	0.128
Follow disaster-related news (Yes)	4.777	0.624	0.162	7.658	p < 0.001	3.554	6.001	0.194	0.164
Have a survival kit (Yes)	2.638	0.505	0.112	5.223	p < 0.001	1.648	3.629	0.141	0.113
Have earthquake insurance (Yes)	1.075	0.389	0.061	2.761	**0.006**	0.312	1.839	0.099	0.060

$F = 12{,}533$; $p < 0.001$; Adj. $R^2 = 0.098$; Durbin Watson = 1888; β^1: Nonstandardized coefficient; β^2: Standardized coefficient.

among all participants, 33.8% experienced a disaster before, 18.2% of whom stated that they had experienced at least one type of loss (loss of property, loss of a relative, or injury). It was deduced that 47.8% of the participants had received disaster-related training, 90.3% followed disaster-related news, 16.6% had a survival kit at home, and 45.8% had earthquake insurance. Compared to relevant studies in the literature, although the participants in our study had limited experience with disasters, they were found to be more eager to receive disaster training and follow disaster-related news. This can be attributed to the fact that Turkey was designated as "Disaster Education Year" in 2021 and "Disaster Practice Year" in 2022, during the research period, and the effect of the activities organized within this scope. The active use of social media as part of such initiatives has contributed to increasing social awareness regarding disasters; social media can be utilized as an effective, alternative method to reach out to individuals affected by disaster [27–29]. Despite attempts to increase awareness as discussed previously, several participants have neither a survival kit at home nor a disaster plan. This can be regarded as an indication that disaster literacy remains at the theoretical level and does not translate into action. It is important to increase the number of similar initiatives in Turkey to turn individuals' knowledge of disaster prevention into action.

Zhang et al. [14] conducted a study to determine disaster literacy levels of university students and factors affecting these levels; the findings deduced that the overall disaster literacy scale of university students was low. In a study conducted by Yusuf et al. [30], less than half of the participants (45.50%) were found to have high disaster knowledge levels [30]. In a study conducted by Sözcü and Aydinözü [7], it was determined that preservice teachers' disaster knowledge level and behaviors were moderate, their affective tendencies were partially strong, and their overall natural disaster literacy level was relatively high. The average of the preservice teachers' total natural disaster literacy scale scores was found to be 40.84 (min: 0, max: 50), which is a moderate score. In a study conducted with prospective geography teachers, it was deduced that their disaster literacy levels are high, but they are at a moderate level in terms of attitude dimension, one of three dimensions of disaster prevention literacy [26]. Fadilah et al. [31] investigated the earthquake literacy levels of individuals who had experienced a disaster and determined that following an earthquake, satisfactory improvement was observed in terms of the skill dimension of disaster prevention literacy whereas the slowest improvement was observed in the knowledge dimension. In another study assessing disaster knowledge and disaster literacy of teachers and secondary school students, it was determined that the level of disaster literacy of participants was sufficient, but their level of knowledge management about disaster literacy was low [17]. Chan et al. [15] stated that the disaster risk literacy levels of Chinese individuals should be improved. Similarly, in our study, more than half of the participants were found to have insufficient/mediocre levels of disaster literacy. These findings reveal that in Turkey, more efforts are required to increase disaster literacy (with its knowledge, affective, and behavioral dimensions). As witnessed in relevant studies, disaster knowledge levels of participants are insufficient, and it is understood that further research is required, especially with regard to the transformation of this knowledge into behavior.

When the disaster literacy levels of participants were examined by gender, it was found that the overall disaster literacy scale score

average of participants did not differ significantly by gender. In a study conducted by Sözcü and Aydinözü [7], when the disaster literacy levels of preservice teachers were examined by gender, it was reported that female preservice teachers were more disaster-literate than male preservice teachers; however, there was no statistically significant difference between them. In their study, Seyihoglu et al. [32] and Türker and Sözcü [26] concluded that disaster literacy levels did not vary by gender. Similarly, in the study conducted by Olowoporoku [18] to investigate disaster literacy levels in Nigeria, no relationship was found between gender and disaster literacy levels. According to a study by Fadilah et al. [31] investigating the earthquake literacy levels of individuals who had experienced a disaster, literacy levels did not differ by gender ($p < 0.05$). The findings of our study are consistent with the results of these previous studies. However, unlike our study, in a study conducted by Ku and Li [33] with the participation of teachers, it was concluded that females had better average scores than males in terms of disaster prevention attitudes. Similarly, Yusuf et al. [30] found in their study that male participants had higher levels of disaster knowledge than female participants. This result is probably related with the characteristics of sample groups and cultural differences between the respective societies of participants.

Exploring the relationship between disaster literacy and income level, in a study conducted by Jafari et al. [34] in Iran to determine the level of preparedness of households for disasters, it was reported that families lacked a low economic status with the necessary information for disaster safety and preparedness. In a study conducted in Australia, Teo et al. [35] determined that among individuals with low socioeconomic status, disaster literacy levels are low and information-seeking disposition is weak, and thus, they are at risk of greater disasters. Similarly, in this study, the overall disaster literacy scale score average of individuals with low monthly income was found to be lower than those with medium/high monthly income. When participants' disaster literacy was compared to their educational level, it was discovered that those with a high school or more advanced educational level had higher disaster literacy scale score averages. Chung and Yen [20], Olowoporoku [18], and Sözcü and Aydinözü [7] all found a statistically significant link between disaster levels and educational status ($p > 0.05$), which is consistent with our findings. A study conducted in Indonesia emphasized the need for optimizing school literacy movement, which comprises learning activities, implementation, and development stages, for raising awareness about disasters [16].

In their study, which assessed the disaster literacy levels of university students and factors affecting these levels, Zhang et al. [14] stated that disaster training and disaster preparedness affect the disaster literacy levels of university students. We have found that disaster literacy scale scores of individuals who reside in disaster-prone areas and areas that experienced natural disasters in recent years are higher. In addition, disaster literacy levels were found to be high in regions inhabited by individuals with better socio-economic levels and better education, which is the primary explanation for the disparity in literacy levels between regions. In a study conducted by Sözcü and Aydinözü [7], the disaster literacy scale score was reported to differ by the region of residence, having experienced a loss in a disaster, having received disaster training, following disaster-related news, having a survival kit and a family disaster plan, and having earthquake insurance. Similarly, in this study, individuals' disaster literacy level scale average score differed by having received disaster training, following disaster-related news, having a survival kit and a family disaster plan, and having earthquake insurance. The disaster literacy scale score varied by age, region of residence, receiving disaster training, following disaster-related news, having a survival kit, and having earthquake insurance. These findings highlight the importance of raising individuals' awareness of disasters.

It is recommended to strengthen public education to increase disaster literacy levels of individuals in Turkey and to popularize disaster training to raise awareness within the society. Turkey has been declared as the "Disaster Training Year" in 2021 to raise awareness regarding disasters and to create a frontline against disasters [5]. From 2021 onward, authorities striving to safeguard and promote public health should join forces to raise society's disaster literacy levels.

4.1. Limitations of the study

By considering samples from a reasonably large population and different regional backgrounds, it can be challenging to determine the unique conditions of disaster literacy. It could be that every citizen in a disaster-prone area has an exceptional understanding of the disaster threat.

5. Conclusion

This study measures disaster literacy levels in Turkey and analyzes related factors. The study findings reveal that more than half of the participants had insufficient/mediocre levels of disaster literacy. There are numerous factors affecting disaster literacy, and the most significant of them is following disaster-related news. Considering environmental issues and climate change, government bodies should be primarily responsible for raising social awareness regarding natural disasters and informing the society about disasters beginning childhood. Moreover, all media outlets should keep natural disasters on their agenda to increase public awareness, and all state institutions and nongovernmental organizations should participate in disaster preparedness and disaster relief efforts. In addition, it is concluded that the number of initiatives should increase to enhance awareness and readiness within the society in terms of disaster reduction and management.

Funding statement

There were no specific funding sources for this study.

Credit author contribution statement

Fatma Zehra Genc: Methodology, Investigation, Data curation, Formal analysis, Writing – original draft. Suzan Yildiz:

Conceptualization, Methodology, Writing–review & editing. Emine Kaya: Conceptualization, Methodology, Writing – review & editing. Naile Bilgili: Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing –review & editing, Supervision.

Data availability statement

The findings of this study can be obtained from the relevant corresponding author upon request.

Declaration of competing interest

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

Acknowledgment

We thank all participants in the present study for their generous cooperation.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijdrr.2022.102991.

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