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Evaluating Disaster Literacy Levels Among First Aid Trainers: The Case of Bursa Province

İlk Yardım Eğitmenlerinin Afet Okuryazarlığı Düzeylerinin Değerlendirilmesi: Bursa İli Örneği

ABSTRACT

Objective

First aid instructors play a vital role in disaster preparedness, response, and recovery processes, making it crucial to understand the factors affecting their disaster literacy levels. This study aims to investigate the factors influencing the disaster literacy levels of first aid instructors.

Material and Methods

This cross-sectional study involved 179 first aid instructors residing in Bursa, Turkey. Data were collected using a Demographic Information Form and the Disaster Literacy Scale (DLS). Binary logistic regression was used to evaluate the factors affecting the DLS scores and its sub-dimensions.

Results

Of the participants, 66.5% were female, 25.7% were nurses, and 50.8% had more than 6 years of teaching experience. The average age of the participants was 39.22 ± 9.07 years, and the mean DLS score was 36.39 ± 6.61 . The sub-dimension scores of the DLS ranged from 35.4 ± 8.46 to 38.62 ± 6.66 . Males (OR=0.33, CI=0.15-0.75), emergency medical technicians (OR=3.18, CI=1.13-8.98), and other healthcare workers (OR=3.32, CI=1.16-9.55) showed lower competency in preparedness. Participants who had received disaster training had higher knowledge in mitigation/prevention (OR=2.81, CI=1.27-6.22), preparedness (OR=2.37, CI=1.05-5.35), recovery/rehabilitation (OR=3.12, CI=1.39-7.05), and overall disaster literacy (OR=2.70, CI=1.22-6.01). Members of non-governmental organizations (NGOs) had higher knowledge in mitigation/prevention (OR=2.64, CI=1.02-6.33), preparedness (OR=3.44, CI=1.30-9.11), and recovery/rehabilitation (OR=2.67, CI=1.04-6.88) compared to non-members.

Conclusion

This study identifies key factors affecting disaster literacy among first aid instructors, highlighting the importance of disaster training and NGO membership in enhancing preparedness and response capabilities. There is a need for further studies to improve disaster literacy levels, particularly in specific sub-dimensions, among first aid instructors. Targeted training programs are recommended to increase disaster preparedness levels.

Key Words

Disaster, Literacy, First aid, Trainer, Education

ÖZ

Amaç

İlk yardım eğitmenleri afete hazırlık, müdahale ve iyileştirme süreçlerinde hayati bir rol oynamaktadır. Bu nedenle afet okuryazarlığı düzeylerini etkileyen faktörlerin anlaşılması önemlidir. Bu çalışma, ilk yardım eğitmenlerinin afet okuryazarlığı düzeylerini etkileyen faktörleri araştırmayı amaçlamaktadır.

Gereç ve Yöntemler

Bu kesitsel çalışmaya Bursa, Türkiye'de ikamet eden 179 ilk yardım eğitmeni dahil edilmiştir. Veriler Demografik Bilgi Formu ve Afet Okuryazarlığı Ölçeği (AOÖ) kullanılarak toplanmıştır. AOÖ puanlarını ve alt boyutlarını etkileyen faktörleri değerlendirmek için ikili lojistik regresyon analizi kullanılmıştır.

Bulgular

Katılımcıların %66,5'i kadın, %25,7'si hemşire ve %50,8'i 6 yıldan fazla eğitimlik deneyimine sahiptir. Katılımcıların yaş ortalaması $39,22 \pm 9,07$ ve ortalama AOÖ puanı $36,39 \pm 6,61$ idi. AOÖ'nün alt boyut puanları $35,4 \pm 8,46$ ile $38,62 \pm 6,66$ arasında değişmektedir. Erkekler (OR=0,33; GA=0,15-0,75), acil tıp teknisyenleri (OR=3,18; GA=1,13-8,98) ve diğer sağlık çalışanları (OR=3,32; GA=1,16-9,55) hazırlık konusunda daha düşük yeterlilik göstermiştir. Afet eğitimi almış katılımcılar, zarar azaltma/önleme (OR=2,81; GA=1,27-6,22), hazırlık (OR=2,37; GA=1,05-5,35), iyileştirme/rehabilitasyon (OR=3,12; GA=1,39-7,05) ve genel afet okuryazarlığı (OR=2,70; GA=1,22-6,01) konularında daha yüksek bilgiye sahip olmuştur. Sivil toplum kuruluşu (STK) üyeleri, STK üyesi olmayanlara kıyasla zarar azaltma/önleme (OR=2,64; GA=1,02-6,33), hazırlık (OR=3,44; GA=1,30-9,11) ve iyileştirme/rehabilitasyon (OR=2,67; GA=1,04-6,88) konularında daha yüksek bilgiye sahiptir.

Sonuç

Bu çalışma, ilk yardım eğitmenlerinin afet okuryazarlığını etkileyen temel faktörleri belirlemekte ve afet eğitiminin ve STK üyeliğinin hazırlıklı olma ve müdahale yeteneklerini geliştirmedeki önemini vurgulamaktadır. İlk yardım eğitmenleri arasında özellikle belirli alt boyutlarda afet okuryazarlığı düzeylerini iyileştirmek için daha fazla çalışmaya ihtiyaç vardır. Afet hazırlığını artırmak için hedefe yönelik eğitim programları önerilmektedir.

Anahtar Kelimeler

Afet, Okuryazarlık, İlk yardım, Eğitmen, Eğitim

INTRODUCTION

Every year, many people around the world are injured and lose their lives as a result of disasters. These disasters typically result in injury, loss of life, and loss of property and livelihoods due to extreme events affecting large groups of people. The impact of these events increases over time, affecting more people and the infrastructure on which they depend (1). In Turkey, due to its geological and topographical structure, earthquakes are frequently encountered and often turn into disasters. According to the Index for Risk Management (INFORM) report, which analyzes potential disaster trends, Turkey is considered risky (2). According to the Sendai Framework for Disaster Risk Reduction, raising public awareness increases the capacity to cope with disasters, and the importance of effective management in efforts to reduce the negative impacts of disasters is emphasized (3). In this context, individuals' knowledge, skills, and attitudes about disasters affect their resilience at each stage of a disaster, highlighting the need to increase awareness. Given the increasing frequency of disaster risks and damages worldwide, disaster literacy is an issue that attracts significant attention.

Disaster literacy includes the knowledge, skills, and attitudes necessary to cope with disasters and is also important for understanding, promoting, and supporting these efforts (4). Disaster literacy is defined as people's capacity to access, understand, appraise, and apply disaster information to make informed decisions and follow instructions in everyday life concerning mitigating, preparing for, responding to, and recovering from a disaster to maintain or improve quality of life throughout their lives (5). In the formulation of disaster preparedness and response strategies, it is necessary to increase knowledge and skills on public health emergencies, which are an important component of the community's response to disasters, in addition to disaster literacy (6). In this regard, it is emphasized that first aid is a critical tool as part of the national disaster plan. First aid provided in cases of acute illness or injury before hospitalization enables the person and those around them to maintain life functions (7).

Most disaster-related deaths occur due to the lack of pre-hospital medical support in the post-disaster period, necessitating the intervention of first aiders until health personnel arrive (8). In fact, first aid practices can prevent the worsening of the situation and increase the chance of survival with simple interventions in life-threatening cases such as disasters (9). Studies have shown that first aid training increases the ability of community members to respond more effectively to prehospital emergencies (10). As a result, first aid training contributes to disaster response capacity and disaster literacy.

First aid training ensures that individuals are informed about the health risks and hazards caused by disasters and raises awareness about interventions. In this context, the International Liaison Committee on Resuscitation (ILCOR) provides the first points of action for intervention in

resource-limited environments by targeting all individuals who are not healthcare personnel with the concept of the chain of survival (11). In Turkey, first aid training is carried out in line with the standards set by the First Aid Regulation. First aid trainers play an important role in increasing the knowledge, skills, and awareness of participants by teaching basic first aid skills to the community and enabling effective intervention in prehospital emergencies. Trainers' understanding of disaster phenomena can enhance first aid training by ensuring skills match real-life situations (12). Training should be regularly updated, refreshed, and enhanced with scenario-based exercises for emergency response (13). To address these training needs, first aid instructors require strong capacities, including disaster literacy, awareness of unique disaster conditions, and tailored educational methods. Despite standardized program topics, trainers' knowledge and experience should adapt to changing needs. This study aims to determine the levels of disaster literacy and its subdimensions among first aid trainers, who are crucial in managing the disaster process for the well-being of societies, and to support development and progress in the fields of first aid and disaster literacy.

MATERIALS and METHODS

Study Design and Participants

This cross-sectional epidemiological study was conducted between November 2022 and October 2023. The population of this study consisted of 196 first aid trainers working in first aid training centers in Bursa, Turkey. Inclusion criteria for the study were residency in Bursa province and active involvement in first aid training. No sampling method was applied, as the aim was to reach the entire population. A total of 179 out of 196 first aid instructors meeting the inclusion criteria (91.4%) voluntarily participated in the research.

Data Collection and Instruments

After obtaining ethical approval and institutional permission, a 20-minute questionnaire consisting of a Demographic Information Form and the Disaster Literacy Scale was administered to the participants for research purposes. The survey was conducted face-to-face with accessible participants, while those working away from the city center were reached through an online form. In both methods, informed consent was obtained from the participants.

The data collection tool consisted of two parts: the Demographic Information Form and the Disaster Literacy Scale (DLS). The Demographic Information Form included 10 questions covering age, gender, education level, profession, marital status, duration of first aid instructorship, disaster experience, disaster education, membership in any non-governmental organizations related to disasters, and previous involvement in disaster response. The DLS, developed by Çalışkan and Üner (2022) consisted of 61 questions and is divided into four sub-dimensions: mitigation/prevention, preparedness, response, and recovery/rehabilitation (14). The mitigation/prevention sub-dimension

comprised 17 items, the preparedness sub-dimension 16 items, the response sub-dimension 13 items, and the recovery/rehabilitation sub-dimension 15 items. Each item was graded on a 5-point scale: 1 point (very difficult), 2 points (difficult), 3 points (undecided), 4 points (easy), and 5 points (very easy). There were no reverse items in the scale. The total score obtainable from the scale ranges from 61 to 305. For ease of calculation, the total score was standardized using the formula " $\text{Index} = (\text{arithmetic mean} - 1) \times (50/4)$ " to obtain a value between 0 and 50. The overall Cronbach's Alpha value of the scale was 0.954, with sub-dimension values ranging between 0.831 and 0.830. Higher scores on the scale indicate higher disaster literacy levels. Scoring was characterized as follows: 0-29 points indicated inadequate DLS, 30-35 points indicated limited DLS, 36-41 points indicated adequate DLS, and 42-50 points indicated excellent DLS.

Statistical Analysis

The frequencies and percentages of the participants' sociodemographic independent variables are presented. The relationship between the DLS, its sub-dimensions, and disaster information processing processes is illustrated with a heat map. The initial forms of the independent variables are as follows: age (years), gender (male/female), education level (associate degree, bachelor's degree, and postgraduate degree), profession (nurse, emergency medical technician, paramedic, biologist, and other), marital status (single, married), duration of instructorship (years), disaster experience (yes/no), disaster education (yes/no), disaster NGO membership (yes/no), and taking part in a disaster (yes/no). Here, age (≥ 39 / ≤ 38) and years of training (≥ 6 / ≤ 5) were re-categorized based on the mean values observed in the sample. DLS and sub-dimension (mitigation/prevention, preparedness, response, and recovery/rehabilitation) scores, which are dependent variables, were converted into four categorical variables (adequate, limited, inadequate, and excellent) using the equation " $\text{Index} = (\text{arithmetic mean} - 1) \times (50/4)$ " specific to literacy domains (accessing, understanding, appraising, and applying information). The percentage distribution of each of these variables was presented graphically.

DLS and its sub-dimensions (inadequate and limited = low, adequate and excellent = high), which were previously converted into four categorical variables using the formula, were re-categorized into two categorical structures. Thus, in the study, the binary logistic model Enter method was used to predict the outcome between the variables and possible factors affecting the participants' scores in DLS and its sub-dimensions. The outcome variable was defined in the model as high (reference) and low disaster literacy. For this purpose, five separate logistic regression models were established with DLS and its sub-dimensions. In the analyses, the Hosmer-Lemeshow test was used for model fit, and the cases with type 1 error levels below 5% were interpreted as statistically significant. SPSS 25.0 statistical package program (IBM; Armonk, New York, USA) was used for data entry.

Ethical Considerations

This study was approved by the University of Health Sciences Hamidiye Scientific Research Ethics Committee on December 12th, 2022, with reference number 14159 (Decision number: 26/25). Participants were informed about the aim and significance of the study and voluntarily provided written and verbal informed consent to participate.

RESULTS

The majority of the participants were female (66.5%) and held a bachelor's degree (59.2%). Nurses were the most represented group (25.7%), followed by EMTs (24.0%) and paramedics (20.1%). Most of the participants were married (68.2%), and the distribution of the duration of instructorship was almost equal between those with five years or less (49.2%) and those with more than six years (50.8%). Disaster experience was reported by 41.3% of the participants, and 39.7% had received disaster education. Membership in disaster-related NGOs was low (20.7%), and 38.5% had participated in a disaster. The mean age of participants was 39.22 ± 9.07 years, with a range from 23 to 63 years (Table I).

Table I. Characteristics of the participants

Variables	n	%
Gender		
Female	119	(66.5)
Male	60	(33.5)
Education level		
Associate degree	43	(24.0)
Bachelor's degree	106	(59.2)
Postgraduate degree	30	(16.8)
Profession		
Nurse	46	(25.7)
EMT	43	(24.0)
Paramedic	36	(20.1)
Biologist	14	(7.8)
Other*	40	(22.3)
Marital status		
Single	57	(31.8)
Married	122	(68.2)
Duration of instructorship		
5 and under	88	(49.2)
6 and above	91	(50.8)
Disaster experience		
Yes	74	(41.3)
No	105	(58.7)
Disaster education		
Yes	71	(39.7)
No	108	(60.3)
Disaster NGO membership		
Yes	37	(20.7)
No	142	(79.3)
Taking part in a disaster		
Yes	69	(38.5)
No	110	(61.5)
	Mean \pm SD	Min - Max
Age	39.22 (9.07)	23 - 63


*Other: Social worker, doctor, optician, environmental health technician, x-ray technician, anaesthesia technician, dialysis technician, laboratory technician, phys-

iotherapist, medical secretary, occupational health specialist, biomedical technician, operating room technician.

The heat map of the participants' scores on the DLS and its sub-dimensions is shown in Figure 1. The highest mean scores or heat temperatures are observed in the areas of understanding information in the preparedness sub-dimension (40.39 ± 7.00), and understanding information (41.30 ± 6.50) and accessing information (40.92 ± 6.70) in the response sub-dimension (Figure 1).

The categorical distributions of the participants' scores on the DLS and its sub-dimensions are presented in Figure 2. Inadequate, limited, adequate, and excellent findings are observed in disaster literacy scores. Accessing information in the preparedness sub-dimension is the most inadequate (54.7%); accessing information in the mitigation sub-dimension is the most limited (30.7%); appraising information in the mitigation and response sub-dimensions and applying information in the preparedness sub-dimension are the most adequate (44.1%); and understanding information in the response sub-dimension is the most excellent (47.5%). DLS and sub-dimension scores were inadequate in the range of 3-55%, limited in the range of 7-30%, adequate in the range of 17-44%, and excellent in the range of 15-47% (Figure 2).

Five different logistic regression models were performed between the DLS and sub-dimension levels of the participants and some variables. The overall DLS scores of the participants who did not receive disaster education were lower (OR=2.70, CI=1.22-6.01; $p=0.02$). In the mitigation/prevention dimension, the DLS scores of the participants who did not receive disaster education (OR=2.81, CI=1.27-6.22; $p=0.01$) and those who did not have NGO membership (OR=2.64, CI=1.02-6.83; $p=0.04$) were lower. In the preparedness sub-dimension, the scores of males (OR=0.33, CI=0.15-0.75; $p=0.01$) were higher and the scores of other health workers (OR=3.32, CI=1.16-9.55; $p=0.03$), the scores of those who did not receive disaster education (OR=2.37, CI=1.05-5.35; $p=0.04$), and the scores of those who did not have NGO membership (OR=3.44, CI=1.30-9.11; $p=0.01$) were lower. In the recovery/rehabilitation sub-dimension, the DLS scores of the participants who did not receive disaster education (OR=3.12, CI=1.39-7.05; $p=0.01$) and the scores of those without NGO membership (OR=2.67, CI=1.04-6.88; $p=0.04$) were lower. No relationship was found between the response sub-dimension and the variables ($p>0.05$) (Table II).

Figure 1. Heat map of participants' disaster literacy levels


0 41.3

Disaster information acquisition processes*

Disaster dimensions	Accessing the information	Understanding the information	Appraising the information	Applying or using the information	Total
Mitigation/ Prevention	37.24 (6.52)	36.13 (8.34)	37.92 (7.73)	29.26 (11.67)	36.03 (6.66)
Preparedness	28.88 (12.15)	40.39 (7.00)	36.94 (7.53)	38.08 (7.53)	36.22 (7.07)
Response	32.05 (10.69)	41.30 (6.50)	40.92 (6.70)	38.30 (10.69)	38.62 (6.66)
Recovery/ Rehabilitation	31.47 (11.26)	39.58 (11.25)	37.36 (8.48)	32.61 (10.62)	35.04 (8.46)
DLS					36.39 (6.61)

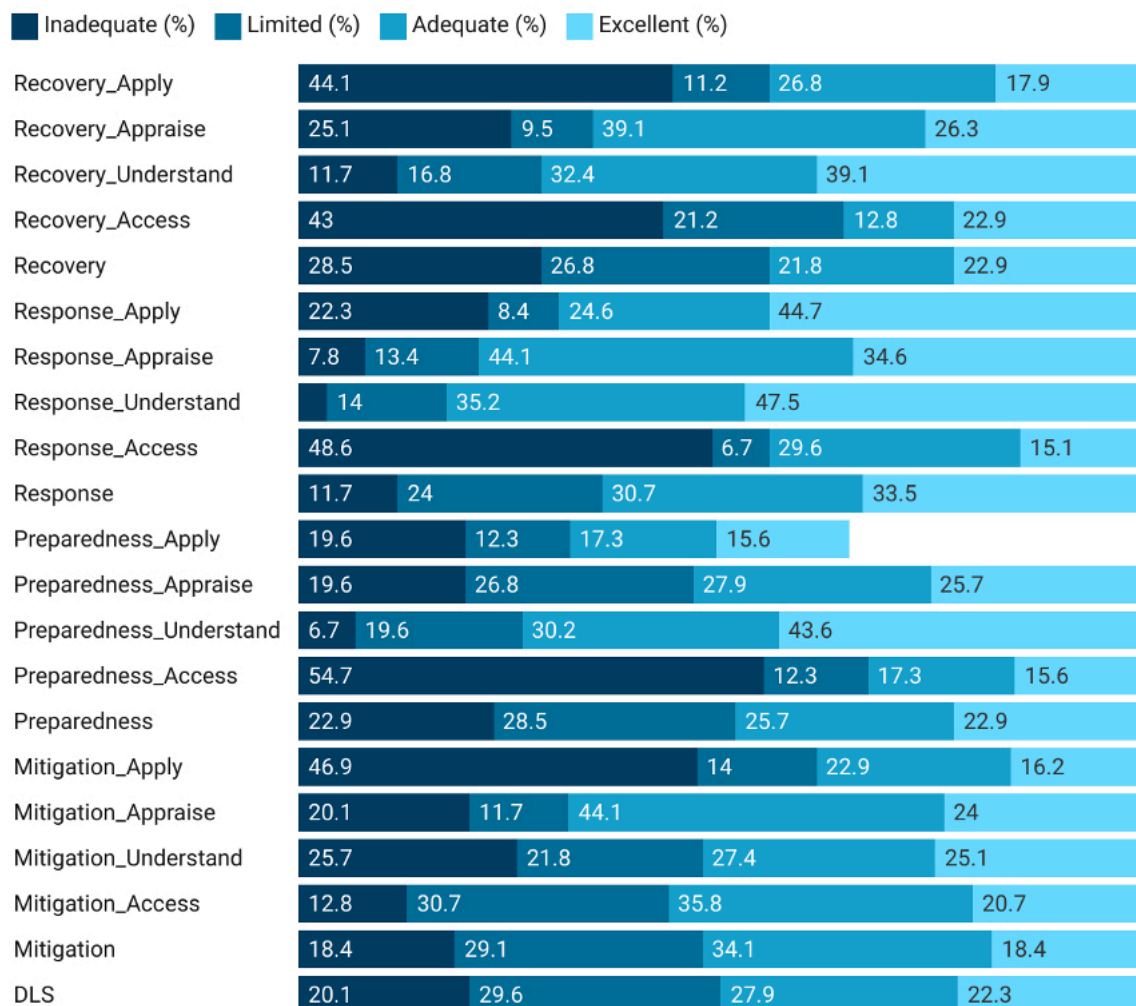
*It is given as $\bar{X} \pm SD$ **Figure 2.** Categorical distribution of participants' disaster literacy scores

Table II. Logistic regression results of DLS and subdimensions

Result Variables	n	DLS	Mitigation/Prevention	Preparedness	Response	Recovery/Rehabilitation
		OR (%95 CI); p	OR (%95 CI); p	OR (%95 CI); p	OR (%95 CI); p	OR (%95 CI); p
		0 = Adequate/Excellent 1 = Inadequate/Limited	0 = Adequate/Excellent 1 = Inadequate/Limited	0 = Adequate/Excellent 1 = Inadequate/Limited	0 = Adequate/Excellent 1 = Inadequate/Limited	0 = Adequate/Excellent 1 = Inadequate/Limited
Gender						
Female (ref)	119					
Male	60	0.60 (0.28-1.31); 0.20	0.49 (0.22-1.08); 0.08	0.33 (0.15-0.75); 0.01	0.68 (0.31-1.49); 0.34	0.72 (0.32-1.60); 0.42
Age						
≥39 (ref)	96					
≤38	83	1.19 (0.55-2.54); 0.66	1.31 (0.61-2.84); 0.49	1.59 (0.73-3.47); 0.25	0.94 (0.44-2.03); 0.88	1.01 (0.46-2.23); 0.98
Education level						
Postgraduate (ref)	30					
Associate degree	43	0.57 (0.20-1.74); 0.32	0.32 (0.10-1.01); 0.05	0.49 (0.16-1.52); 0.22	0.94 (0.29-3.02); 0.92	0.58 (0.19-1.78); 0.34
Bachelor's degree	106	1.57 (0.62-3.96); 0.34	0.82 (0.32-2.10); 0.68	1.31 (0.51-3.35); 0.57	1.84 (0.70-4.81); 0.21	1.33 (0.51-3.45); 0.56
Profession						
Nurse (ref)	46					
EMT	43	1.62 (0.59-4.41); 0.35	1.73 (0.63-4.78); 0.29	3.18 (1.13-8.98); 0.03	1.13 (0.40-3.18); 0.81	1.16 (0.42-3.22); 0.78
Paramedic	36	1.34 (0.44-4.08); 0.61	2.55 (0.79-8.19); 0.12	3.16 (0.97-10.26); 0.06	1.59 (0.52-4.87); 0.41	2.69 (0.82-8.86); 0.10
Biologist	14	2.63 (0.64-10.81); 0.18	1.33 (0.33-5.41); 0.69	1.80 (0.43-7.46); 0.42	2.11 (0.54-8.33); 0.29	4.76 (0.99-22.97); 0.05
Other	40	1.34 (0.49-3.71); 0.57	1.18 (0.42-3.32); 0.76	3.32 (1.16-9.55); 0.03	1.80 (0.65-5.03); 0.26	1.45 (0.52-4.08); 0.48
Marital status						
Married (ref)	122					
Single	57	0.75 (0.35-1.61); 0.46	0.52 (0.24-1.14); 0.10	0.54 (0.24-1.19); 0.13	0.59 (0.27-1.29); 0.19	0.47 (0.21-1.03); 0.06
Duration of instructorship						
6 and above (ref)	91					
5 and under	88	1.13 (0.54-2.36); 0.74	0.95 (0.45-1.99); 0.89	0.96 (0.46-2.03); 0.92	1.15 (0.55-2.41); 0.72	1.19 (0.55-2.55); 0.66
Disaster experience						
Yes (ref)	74					
No	105	1.74 (0.88-3.41); 0.11	1.43 (0.73-2.82); 0.30	1.29 (0.65-2.55); 0.46	1.40 (0.71-2.76); 0.33	1.15 (0.58-2.27); 0.69
Disaster education						
Yes (ref)	71					
No	108	2.70 (1.22-6.01); 0.02	2.81 (1.27-6.22); 0.01	2.37 (1.05-5.35); 0.04	1.86 (0.84-4.09); 0.12	3.12 (1.39-7.05); 0.01
Disaster NGO membership						
Yes (ref)	37					
No	142	2.47 (0.96-6.35); 0.06	2.64 (1.02-6.83); 0.04	3.44 (1.30-9.11); 0.01	1.74 (0.66-4.57); 0.26	2.67 (1.04-6.88); 0.04
Taking part in a disaster						
Yes (ref)	69					
No	110	1.19 (0.54-2.63); 0.67	0.96 (0.43-2.13); 0.92	1.13 (0.50-2.53); 0.77	0.88 (0.40-1.95); 0.76	1.43 (0.63-3.23); 0.39
Constant		-2.092; 0.014	-1.342; 0.110	-2.107; 0.015	-1.965; 0.022	0.177; 0.041
CS: Correct classification		%65.9	%67.0	%67.6	%66.5	%67.0
HL: Hosmer-Lemeshow		0.656	0.319	0.811	0.481	0.111
Ref: Reference						
DLS: Disaster Literacy Scale						

DISCUSSION

In this study, some demographic factors affecting the disaster literacy status of first aid trainers were examined. These factors are important in solving health problems arising in disasters and emergencies. Because disaster literacy can be used as a technique to minimize the risk of disasters, high disaster literacy among trainers can encourage the behavioral responses of participants to disasters and contribute to the level of knowledge about disasters and disaster risk reduction (15). On the other hand, the subjects included in first aid training programs cover the information needed for prehospital health problems caused by disasters. Although this information is limited within first aid resources, trainers need to adapt their training to current needs and realities. In fact, in environments with unique conditions such as disasters, adapting evidence-based first aid skills - especially in crime scene management and safety - to the disaster environment will help understand disaster risk (12). Additionally, in the First Aid Regulation, first aid training in disasters is also specified within the scope of the training that first aid trainers can provide, and its duration and content are detailed.

When disaster literacy studies are evaluated in the literature, it is seen that different participant groups are involved

in the studies. When the studies in which DLS was applied are evaluated, various findings emerge: in one study, the DLS score of individuals aged 18-60 years was found to be limited at 35.00; an inadequate DLS score of 27.29 was reported in a study conducted with nursing home residents; limited scores of 35.61 and 32.97 were found in two studies conducted with nursing students; in another study conducted with prehospital emergency health care workers, the adequacy rate was 36.40; and an inadequate score of 39% was reported in another study conducted with individuals over the age of 18 living in Istanbul (16-21). When reviewing other studies related to disaster literacy, it was found that while the general disaster literacy levels among university students were evaluated to be low; in studies conducted with teacher candidates and teachers, the levels of natural disaster literacy were found to be above average (22-24). In another study conducted with teacher candidates, it was also found that their levels of natural disaster literacy were relatively high; however, their disaster knowledge levels and behaviors were moderate, while their affective tendencies were partially strong (25). When compared with other groups studied in the literature, it can be noted that groups with teaching skills and professional-level health education have relatively higher levels of disaster literacy (18, 19, 23, 25, 26). Therefore, it is possible to mention the positive impact of first aid instructors having educational skills and

professional-level health education on disaster literacy.

In this study, the overall disaster literacy score of first aid instructors was found to be 36.39, with the highest total score among the sub-dimensions being 38.62 for the response dimension. Additionally, it was determined that the first aid trainers were most adequate in the areas of appraising knowledge in the sub-dimensions of mitigation and response, and applying knowledge in the sub-dimension of preparedness. In this context, it can be said that first aid knowledge is especially needed in the response phase, and this dimension is higher than others because it contributes to the understanding of information. However, the lowest scores were observed in the access to information sub-dimension of preparedness (28.8%) and the application of information sub-dimension of mitigation/prevention (29.2%), indicating that participants fell into the limited category in these areas. In this context, it is evident that there are areas where the disaster literacy levels of first aid trainers need improvement. This indicates that if first aid trainers' access to disaster information is improved, it will make a positive contribution considering their competencies in the evaluation and application of information. Therefore, efforts to improve disaster literacy should focus on specific areas, particularly access to disaster-related information and the effective application of this information. These areas can be addressed by integrating disaster-related content into formal education systems, from primary school through higher education. Additionally, ongoing training and disaster drills for first aid trainers can help address gaps in disaster preparedness and response skills. Developing specialized training modules for different educational levels and professional groups can further enhance disaster awareness and address the gaps identified in this study.

No difference was found between the age variable of first aid instructors and disaster literacy and its sub-dimensions. In many studies in the literature, it has been found that as the age of participants increases, there is an increase in their general disaster literacy levels (17, 22). Özata's study on nursing students also yielded similar results to this study (20). However, a study found that younger individuals were more likely to reach an excellent level of disaster literacy. This situation can be interpreted as the possibility that disaster education activities targeting the younger population will contribute to disaster literacy (21).

Although there was no difference in the total DLS score in the gender variable, it was determined that the preparedness sub-dimension was higher in male participants. In other disaster literacy studies, although there was no difference in the total DLS score in the gender variable (20, 24, 25, 27-29). In Karakaş's study, disaster literacy scores of males were found to be high in the recovery and mitigation sub-dimensions, in Çelebi and Sarikahya's study, disaster literacy scores of females were found to be high, and in Bulut's study, the female gender variable had a positive effect on disaster literacy (17, 18, 21). On the other hand, it is important to investigate the effects of gender on disaster preparedness

behaviors (30, 31).

No difference was found in DLS and its sub-dimensions in the education level variable of first aid trainers. In the study by Çelebi and Sarikahya, the level of disaster literacy and all sub-dimensions of 1st-year university students were found to be high (18). However, in another study conducted among university students, the level of disaster literacy increased as the grade level increased (16, 22, 25, 29, 32). Additionally, there is a study indicating that a low level of education negatively affects disaster literacy (33). In Karakaş's study, the disaster literacy level of participants with high school and higher education levels was found to be high (17). Furthermore, it is thought that well-educated individuals may generally be more prepared to cope with disasters and may have higher knowledge and awareness about disaster management (30). Studies emphasize that learning, implementation, and development activities to increase the level of disaster awareness should be optimized in schools (19, 34-36).

In this study, no difference was found in the levels of disaster literacy and some sub-dimensions in the title variable of first aid trainers. However, the level of the preparedness sub-dimension was found to be low in EMTs and other health workers. The need for EMTs, who have an important place in prehospital emergency health services, to receive disaster training is emphasized in many studies (37-39). Additionally, there is a need for different health professionals to receive disaster training during their education and to examine their disaster literacy levels in detail.

No difference was found in DLS and its sub-dimensions in the marital status variable. In the literature, it has been observed that the resettlement process affects married groups more than single groups in recovery studies, and in general disaster awareness studies, married participants have a higher level of disaster knowledge than single participants (40-43). Other studies mention that married participants have more social support in the post-disaster process and that married individuals may have more responsibilities towards their families in disaster situations (44, 45). Therefore, their awareness and preparation for disaster literacy may be higher.

In this study, no difference was found in the DLS and its sub-dimensions concerning the variables of the first aid trainers' duration of training, whether they or their relatives experienced a disaster in the past, and whether they were assigned to a disaster area in the past. This result aligns with some studies in the literature (17, 20, 25). However, there are also studies indicating that disaster experience increases the level of disaster literacy (18, 22, 24, 26, 46). In Demirdelen and Çakıcı's study, the behavioral disaster literacy of participants without disaster experience was found to be high (23). Additionally, there are studies showing that participants working in the disaster area have higher disaster literacy (26, 47, 48). In another study investigating earthquake literacy levels, it was found that participants

who had experienced an earthquake had improved disaster prevention skills (28). It is emphasized that experiences of past emergencies have a strong impact on recognizing and evaluating these situations in the future (49).

In this study, 39.7% of the participants received disaster-related training. According to the findings, those who did not receive any disaster-related training from first aid trainers had lower DLS total scores and sub-dimensions of mitigation/prevention, preparedness, and recovery/rehabilitation. In the literature, it has been determined that the factor of receiving disaster training positively affects disaster literacy (16, 19, 22, 24, 25).

In Genç's study, 47.8% of the participants; in Olowoporoku's study, 39.9%; and according to Sözcü and Aydınöz's study, 44% received disaster-related training (16, 25, 29). Considering the low rates of disaster education found in studies on disasters and the effect of disaster education on disaster literacy, it is clear that providing disaster education to all segments of society starting from schools will contribute to the management of disaster risk (35). In this context, it can be said that disaster education contributes to understanding potential risks and taking necessary precautions to reduce damage. When first aid trainers are evaluated both as members of society and as individuals who contribute to the education of others, the importance of receiving disaster training becomes even more significant.

Although it was determined that the first aid trainers' membership to any non-governmental organization related to disasters did not show any difference in the DLS total score, the levels of mitigation/prevention, preparedness, and recovery/rehabilitation sub-dimensions of those who were not NGO members were found to be low. It is emphasized that being a member of a non-governmental organization affects the capacity to cope with disasters and highlights the importance of acting jointly compared to individual efforts in coping with disasters (50).

Study Limitation

The findings of this study should be interpreted in the context of the following issues. The study is based on self-reports of first aid instructors regarding their disaster literacy tendencies. A significant limitation is that the research universe only includes the province of Bursa and active first aid instructors conducting first aid training. Additionally, the study did not include a question group that could infer between emergency and disaster-related topics in the first aid certification program and the DLS.

CONCLUSIONS

In this study, the overall DLS scores of first aid trainers have been found to be adequate. Specifically, when evaluating the sub-dimensions and learning areas of disaster literacy, it has been observed that first aid trainers are particularly successful in understanding information in the intervention sub-dimension. However, it was found that participants had insufficient access to information in the preparedness sub-dimension. Therefore, efforts to increase first aid instructors' access to disaster-related knowledge, as well as enable instructors to use knowledge in disaster preparedness and evaluate knowledge in mitigation and response efforts, should be implemented. In this context, it is recommended to create tailored disaster education programs based on the participants' educational level and professional role. For instance, basic disaster literacy concepts can be introduced in schools, while more advanced topics could be integrated into vocational and professional training programs. In addition, regular disaster preparedness simulations and workshops aimed at increasing hands-on experience and knowledge application could be beneficial, particularly for healthcare professionals like first aid instructors. The findings of this study provide a pathway for future studies proposing a potential first aid instructor training program aimed at improving disaster literacy levels.

Ethics Committee Approval

This research complies with all the relevant national regulations, institutional policies and is in accordance with the tenets of the Helsinki Declaration, and has been approved by the Hamidiye Scientific Research Ethics Committee of the University of Health Sciences (approval number: 2022/14159).

Informed Consent

All the participants' rights were protected and written informed consents were obtained before the procedures according to the Helsinki Declaration.

Author Contributions

Concept - T.Ö., C.Ç., Design - T.Ö., C.Ç., Supervision - C.Ç., K.K., Materials - T.Ö., A.D.K., Data Collection or Processing - Ö.T., A.D.K., Analysis and/or Interpretation - A.D.K., C.Ç., Literature Search - T.Ö., A.D.K., C.Ç., K.K., Writing Manuscript - T.Ö., A.D.K., C.Ç., K.K., Critical Review - T.Ö., A.D.K., C.Ç., K.K.

Conflict of Interest

The authors have no conflict of interest to declare.

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