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The Effect of Disaster Awareness Levels of Healthcare Professionals on Disaster Preparedness: A Cross-Sectional Study

Sağlık Çalışanlarının Afet Bilinç Düzeylerinin Afetlere Hazırbulunuşluk Durumuna Etkisi: Kesitsel Bir Çalışma

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ABSTRACT Objective: This study aims to evaluate the perceptions of healthcare professionals regarding their knowledge, skills, and readiness for disaster management and to examine the effect of disaster awareness levels on their preparedness for disasters. **Material and Methods:** The research data were collected by conducting an online survey through Google Forms with healthcare professionals residing in a city centre. Participants (n=394) were selected using the random sampling method. To measure the disaster awareness levels of the participants, the Disaster Readiness Scale developed by Inal et al. was used, whereas the Disaster Readiness Scale developed by Şentuna and Çakı was used to measure disaster preparedness. The SPSS 25.0 program was used to analyze the data obtained. The Pearson correlation analysis was used to look at the relationship between the variables, whereas the simple regression analysis was used to observe the effect between variables. **Results:** As a result of the study, it was determined that there was a positive significant relationship between the disaster awareness levels of healthcare professionals and their disaster preparedness and its subdimensions. Additionally, it has been revealed that the level of disaster awareness has a positive and significant effect on disaster preparedness. It was found that the factors affecting the level of disaster awareness and disaster preparedness of healthcare professionals were profession, age, and gender. **Conclusion:** Study findings showed that disaster awareness levels had a significant impact on the disaster preparedness behaviors of healthcare professionals.

Keywords: Disaster; disaster awareness; preparedness; health professionals

ÖZET Amaç: Bu çalışma, sağlık çalışanlarının afet yönetimine yönelik bilgi, beceri ve hazırlıklarına ilişkin algılarını değerlendirmek ve afet bilinç düzeylerinin afetlere hazırlık durumlarına etkisini incelemeyi amaçlamaktadır. **Gereç ve Yöntemler:** Araştırma verileri bir il merkezinde ikamet etmekte olan sağlık çalışanlarına anket formu tekniği uygulanarak Google Forms üzerinden çevrim içi anketle toplanmıştır. Katılımcılar (n=394), tesadüfi örnekleme yöntemi kullanılarak seçilmiştir. Katılımcıların afet bilinç düzeylerini ölçmek için İnal ve ark. tarafından geliştirilen Afet Bilinci Ölçeği, afetlere hazırlık durumlarını ölçmek için ise Şentuna ve Çakı tarafından geliştirilen Afetlere Hazırlık Ölçeği kullanılmıştır. Elde edilen verilerin analizinde SPSS 25.0 programı kullanılmıştır. Değişkenler arasındaki ilişkiye değerlendirmek için Pearson korelasyon analizleri ve değişkenler arası etkiye bakmak için basit regresyon analizi kullanılmıştır. **Bulgular:** Çalışma sonucunda, sağlık çalışanlarının afet bilinç düzeylerinin, afetlere hazırlık durumları ve alt boyutları arasında pozitif yönde anlamlı bir ilişki olduğu tespit edilmiştir. Ayrıca afet bilinç düzeyinin, afetlere hazırlık üzerinde pozitif yönde anlamlı bir etkiye sahip olduğu ortaya konulmuştur. Sağlık çalışanlarının afet bilinç düzeyleri ile afetlere hazırlık durumlarını etkileyen faktörlerin meslek, yaş ve cinsiyet olduğu bulunmuştur. **Sonuç:** Çalışma bulguları sağlık çalışanlarının afetlere hazırlık davranışlarında, afet bilinç düzeylerinin önemli etkisinin olduğunu göstermektedir.

Anahtar Kelimeler: Afet; afet bilinci; hazırlık; sağlık çalışanları

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Disasters are defined as the result of natural or human-induced events that occur unexpectedly at an unexpected time and affect society in social, economic, psychological, and many other aspects.[1] To cope with the unexpected effects of disasters and minimize the damage caused by disasters, all stages of disaster management systems must be fully applied. In disaster management systems, healthcare professionals have important duties. After a disaster occurs, healthcare professionals help disaster victims in addition to their routine work. This strains the capacity of both the healthcare institution and healthcare professionals.[2]

Healthcare professionals are on the front lines in responding to disasters. Therefore, it is particularly important to ensure that their knowledge and skills are sufficient to respond to such incidents.[3-5] However, when the literature is examined, there are many claims that healthcare professionals do not have the necessary competence for this task.[5-8] When the literature is analyzed, it can additionally be observed that many factors such as education level, age, gender, profession, professional experience, marital status, and disaster experience affect the disaster awareness levels and preparations of healthcare professionals.[9-11] Considering that preparedness is linked to performance in disaster situations, it is clear that the level of disaster awareness must be high for healthcare professionals to successfully respond to disasters.[8,12]

It has been observed that studies have recently been carried out globally to improve the disaster competencies of healthcare professionals. For example, the World Health Organization and the International Council of Nurses have collaborated to develop a set of competencies recommended as minimum requirements for healthcare professionals to be prepared in responding to disasters.[2] Accordingly, the promotion of disaster competencies in undergraduate curricula has been suggested to improve disaster competencies.[13] However, research shows that current curricula do not adequately prepare healthcare professionals to respond to disasters.[7,14,15]

Although there is a call for more disaster preparedness training at both undergraduate and graduate levels, the number of evidence-based training programs appears to be low.[16] Interestingly, many of the skills required to effectively respond to disasters appear to be skills used daily by emergency service professionals.[6,17] This suggests that perhaps the best solution for disaster preparedness training for healthcare professionals is to work alternately in emergency service units or receive more disaster training.

The aim of this study is to evaluate the factors affecting the knowledge, skills, and preparedness of healthcare professionals for disaster management and to investigate the effect of their level of disaster awareness on their disaster preparedness. In line with the aim of the study, answers to the following research questions were sought:

(i) What are the factors affecting the disaster awareness levels and disaster preparedness levels of healthcare professionals?

(ii) Do the disaster awareness levels of healthcare professionals affect their disaster preparedness?

Based on the research questions, data were collected and analyzed. Based on the findings, the results are discussed and recommendations are presented.

MATERIAL AND METHODS

PARTICIPANTS

This cross-sectional study included healthcare professionals living in a city centre.

The aim was to reach 384 people, which is the sample size developed by Collins and used when the number of units in the population is unknown when determining the sample size.[18] The data collection form was sent to the participants via Google Forms (Google LLC, ABD), and the participants who gave their informed consent on the first page of the form, filled it out. A total of 404 data forms were analyzed. All healthcare professionals living in a city centre were included in the study. Within the scope of the relevant population, it was observed that the sample was sufficient for the 5% error level, which is frequently aimed for in social sciences.[19]

DATA COLLECTION FORM

A data collection form consisting of 3 parts was used in the study. In the first section, the demographic characteristics of the participants included in the

study were determined. In the second section, the Disaster Awareness Scale developed by İnal et al. was used to measure the disaster awareness of the participants.[20] The scale consists of 17 items and is a 3-point Likert scale including frequency expressions such as "No" (0), "Slightly" (1), and "Yes" (2). In the third section, the Disaster Readiness Scale developed by Şentuna and Çakı was used to measure the disaster preparedness of participants.[21] The scale consists of 13 items and questions were answered according to a 4-category rating scale ranging from definitely no (1), no (2), yes (3), definitely yes (4). Therefore, the scale is a 4-point Likert scale.

ETHICAL APPROVAL

This study was carried out in accordance with the Declaration of Helsinki. For this study, ethical approval was obtained from the Ethics Committee of Kayseri University (date: October 9, 2023, no: 76/2023). Before participating in the survey, informed consent was obtained from each participant.

DATA ANALYSIS

Statistical analysis of the research data was carried out using the SPSS 25.0 package program (IBM Corp., Armonk, NY, ABD). The reliability of the scale data was evaluated with the Cronbach's alpha statistic in this study. According to Kılıç, the scale has medium reliability if the Cronbach's alpha value is between $0.61<\alpha<0.80$.[22] When the reliability coefficient of the scale falls within the range of $0.80\leq\alpha<1.00$, this indicates that the scale is highly reliable.

The reliability Cronbach's alpha values of the scales were determined to be as follows:

- Disaster Awareness Scale: 0.76
- Disaster Readiness Scale: 0.89.

The Pearson correlation analysis was used to examine the relationship between scale scores, after which the regression analysis was used to determine the causality effect. The significance level in the analyses was determined to be 0.05 ($p<0.05$).

RESULTS

Information about the demographic and individual characteristics of the participants in this study is given in Table 1.

It was determined that 53.2% (n=215) of the participants were male, 30.9% (n=125) were between the ages of 30-39, 55.0% (n=222) were unmarried, and 44.3% (n=179) had a bachelor's degree. Additionally, it was determined that 25.2% (n=102) of the participants had been working in their current institution for 1-5 years, and 35.6% (n=144) were other healthcare professionals (Table 1).

When Table 2 is examined, a positive significant relationship can be found between physical protection in disasters ($r=0.702$; $p<0.01$), disaster planning ($r=0.628$; $p<0.01$), disaster relief ($r=0.553$; $p<0.01$), and disaster warning and systems ($r=0.527$; $p<0.01$), which are the sub-dimensions of the disaster awareness level and disaster preparedness, and the total disaster preparedness ($r=0.733$; $p<0.01$). It was observed

TABLE 1: Demographic characteristics.

Demographic/individual findings		n	%
Gender	Female	183	46.4
	Male	211	53.6
	Total	394	100.0
Age	20-29	111	28.2
	30-39	122	31.0
	40-49	92	23.4
	50-59	53	13.5
	60 and older	16	4.1
	Total	394	100.0
Marital status	Married	179	45.4
	Unmarried	215	54.6
	Total	394	100.0
Level of education	High school	65	16.5
	Associate degree	95	24.1
	Bachelor	175	44.4
	Postgraduate	59	15.0
	Total	394	100.0
Duration of employment	Less than 1 year	67	17.0
	1-5 years	99	25.1
	6-10 years	81	20.6
	11-15 years	64	16.2
	16-20 years	38	9.6
	20 years and longer	45	11.4
	Total	394	100.0
Profession	Doctor	33	8.4
	Nurse	89	22.6
	Midwife	70	17.8
	Technician	60	15.2
	Other	142	36.0
	Total	394	100.0

TABLE 2: Mean, standard deviation and correlation analysis between research variables.

Dimensions	$\bar{X}$	SD	1	2	3	4	5	6
1. Total disaster awareness level	1.03	0.37	1					
2. Total disaster preparedness	2.61	0.61	**0.718****	1				
3. Physical protection in disasters	2.59	0.67	**0.677****	**0.918****	1			
4. Disaster planning	2.61	0.75	**0.620****	**0.861****	**0.725****	1		
5. Disaster relief	2.76	0.72	**0.549****	**0.793****	**0.621****	**0.557****	1	
6. Disaster warning and systems	2.47	0.79	**0.541****	**0.764****	**0.609****	**0.599****	**0.508****	1

**p<0.01; SS: Standard deviation.

TABLE 3: Simple regression analysis of the effect of disaster awareness level on disaster preparedness.

Independent variable	B	β	t value	p value
Invariable	1.399		22.062	0.0000
Disaster awareness level	1.173	0.718	20.439	0.0000

R=0.718 R2=0.516 ΔR2=0.515
F=417.770 p=0.0000

that employees with a high level of disaster awareness had a high level of disaster preparedness, and individuals with a low level of disaster awareness had a low level of disaster preparedness.

Due to the existence of a linear relationship between the variables for regression analysis, the simple regression analysis was applied between two variables to determine the causality effect of the disaster awareness level on disaster preparedness.

When Table 3 is examined, it can be observed that the regression model established between the independent (disaster awareness level) and dependent (disaster preparedness) variables was appropriate ($F=466.2661$; $p<0.05$). The disaster awareness level explains approximately 531% of the variation in disaster preparedness ($DR^2=0.516$).

When the t-test results regarding the significance of the regression coefficients are examined, it can be observed that the level of disaster awareness has a positive significant effect on disaster preparedness ($\beta=0.733$; $t=21.602$; $p<0.0000$). As the disaster awareness level of employees increases, their preparedness for disasters increases, whereas disaster preparedness decreases as disaster awareness levels decrease.

Based on the regression analysis results, the mathematical model for predicting disaster preparedness by the disaster awareness level variable is as follows:

Disaster Awareness Level=1.399 + 0.718 * Disaster Readiness

According to the t-test and analysis of variance results conducted to verify whether there were differences in terms of demographic variables, it was determined that there was a significant difference between gender, age and profession, and disaster preparedness. It has been determined that women had higher disaster preparedness levels than men, and that the marital status, education, and years of employment of the participating healthcare professionals had an insignificant relationship with both disaster awareness levels and disaster preparedness. However, it was observed that the disaster awareness levels of younger healthcare professionals were higher than that of the older group and that they were more prepared for disasters.

DISCUSSION

Disasters have negative effects on societies in economic, social, psychological, and many other aspects. One of the most necessary services in disasters that

have a negative impact on society is healthcare services. Due to the need for healthcare services after disasters, healthcare professionals have important responsibilities.[3,5] Therefore, the sensitivity level of healthcare professionals is expected to be higher than in other segments of the society.[23] Therefore, this study aimed to determine the disaster awareness levels of healthcare professionals and the factors affecting their disaster awareness and to examine the effect of disaster awareness levels on disaster preparedness.

When the findings obtained from the analysis are examined, it can be concluded that the disaster awareness levels of healthcare professionals have a positive and significant effect on disaster preparedness, and that employees with a high level of disaster awareness are better prepared for disasters. In the examination of the literature, Akbar et al., who obtained results similar to the results of our study, found in their research that having a high level of disaster awareness had a positive and significant effect on disaster preparedness.[24] Another similar study was conducted by Ao et al., and concluded that individuals with a knowledgeable awareness of earthquakes were more likely to be prepared for an earthquake.[25] Studies have shown that disaster preparedness actions can significantly and directly affect disaster preparedness.[26,27]

When the literature is analyzed, it is seen that profession, professional experience, age, gender, disaster experience, marital status, education level, and factors not limited to these affect disaster awareness and disaster preparedness of health professionals. Ünal et al. stated that men are more prepared for disasters than women due to their social roles; the effect of age factor on disaster preparedness may be due to past disaster experience or stable living conditions; and the factor of past disaster experience may cause motivation for disaster preparedness.[11] Çelebi and Uçku, stated that the increase in the education level of healthcare professionals increases their level of disaster knowledge, the reason for this may be that the increase in the education level increases individual disaster preparedness; married people may have higher disaster awareness due to their responsibility; the effect of the profession on disaster preparedness may be related to the level of education.[10]

In our study, it was determined that there was a relationship between the level of disaster awareness and disaster preparedness and the profession variable. It is thought that this result is due to the units, ages and disaster awareness trainings of the participants included in our study. When the studies are analyzed, it can be observed that there are studies present which determine that the profession factor is a factor affecting disaster awareness and disaster preparedness in healthcare professionals, similar to our study.[28,29] However, in one study, it is observed that profession do not affect the disaster preparedness and awareness level.[30]

In our study, it was concluded that there is a relationship between the level of disaster awareness and disaster preparedness and the age variable, and that participants in the 30-39 age group were more prepared than those in the 40-49 and 50-59 age groups. This difference may have resulted from the higher participation of the 30-39 age group in the study, disaster experience or education level. When the literature is examined, there are studies that reveal similar results to the results of our study, as well as studies that reveal the opposite.[11,31]

In our study, it was determined that female healthcare professionals were more prepared for disasters than male healthcare professionals. It is thought that this result may be due to women's willingness to play a role as responders in disasters. When the studies are examined, it is observed that the disaster preparedness and disaster awareness levels of women are higher than men, similar to the results of our study.[32,33] However, when some studies are analyzed, it can be observed that there results contrary to our study are present.[11,34]

CONCLUSION

Healthcare professionals have many duties in the aftermath of devastating disasters that occur unexpectedly at unexpected moments. Therefore, in this study, the aim was to evaluate the factors affecting the knowledge, skills and preparedness of healthcare professionals for disaster management and to investigate the effect of their level of disaster awareness on their disaster preparedness. For this purpose, answers to the following research questions were sought:

■ What are the factors affecting the disaster awareness levels and disaster preparedness levels of healthcare professionals?

■ Do the disaster awareness levels of healthcare professionals affect their disaster preparedness?

When the findings obtained from the analyses are examined, the following conclusions can be drawn.

In our study, it was concluded that the level of disaster awareness of healthcare workers has a significant effect on disaster preparedness and that occupation, age, and gender factors affect disaster preparedness but are not limited to these factors.

In line with these study results, providing training to healthcare professionals on disasters and conducting disaster drills for employees in order to increase disaster awareness and preparedness for disasters is recommended. For future research, it is recommended that the effects on the disaster preparedness of healthcare professionals by using all other variables in the literature are examined, the results of this study are reviewed with different studies examining the relationship between disaster awareness and disaster preparedness, and further studies be conducted using qualitative research methods.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Emrah Gökkaya, Özge Üstün;* ***Design:*** *Emrah Gökkaya, Özge Üstün;* ***Control/Supervision:*** *Emrah Gökkaya;* ***Data Collection and/or Processing:*** *Emrah Gökkaya, Özge Üstün;* ***Analysis and/or Interpretation:*** *Emrah Gökkaya, Özge Üstün;* ***Literature Review:*** *Emrah Gökkaya;* ***Writing the Article:*** *Emrah Gökkaya, Özge Üstün;* ***Critical Review:*** *Emrah Gökkaya;* ***References and Fundings:*** *Emrah Gökkaya, Özge Üstün;* ***Materials:*** *Emrah Gökkaya, Özge Üstün.*

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