

Preparedness of Emergency Departments in Turkish Hospitals for Disasters and Recommendations for Future Planning: The Case of the Kahramanmaraş Earthquake

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Abstract

Purpose: The February 6, 2023, Kahramanmaraş earthquake caused severe structural damage to hospitals and disrupted emergency healthcare services, underscoring the importance of well-prepared Hospital Disaster and Emergency Plans (HAPs). This study evaluated the experiences of emergency physicians, nurses, paramedics, and support staff in emergency departments (EDs) during and after the earthquake, focusing on hospital preparedness, disaster-response effectiveness, and infrastructure challenges.

Methods: In this descriptive cross-sectional study, healthcare professionals working in EDs across six earthquake-affected provinces (Gaziantep, Adiyaman, Kahramanmaraş, Şanlıurfa, Kilis, and Malatya) completed an online survey assessing sociodemographic characteristics, presence at the hospital during and after the earthquake, perceived adequacy of disaster preparedness, implementation of HAP protocols, and infrastructure conditions.

Results: A total of 189 healthcare professionals participated. Structural damage was reported in 76.2% of hospitals, yet 84.7% of respondents remained at or returned to their workplace. Only 46.0% reported that the HAP was implemented, and 69.3% were unaware of their hospital's designated disaster chairperson. Overall, 56.6% considered their hospital inadequately prepared, and 59.8% reported a lack of regular training and drills. Infrastructure problems were common: 39.7% experienced power outages, 50.3% heating problems, and 45.5% water shortages. Concern for family safety adversely affected patient-care focus in 60.3% of respondents.

Conclusion: Significant gaps in hospital disaster preparedness were identified, including limited awareness of HAP protocols, insufficient training, and infrastructure vulnerabilities. Strengthening disaster-response plans, expanding staff training, and improving resource allocation are essential to enhance hospital resilience. Further research is needed to develop and validate standardized hospital disaster-management strategies.

Key Words: Disaster Planning; Earthquakes; Emergency Service, Hospital; Emergency Medicine; Health Personnel

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Introduction

Earthquakes are major disasters that occur unexpectedly, causing significant casualties and injuries. During an earthquake, hospitals, especially emergency departments, face extraordinary workloads and chaotic environments in addition to structural damage (1). Emergency medicine specialists and other professionals bear the most critical responsibilities during and after a disaster. In such cases, they must manage not only healthcare services, but also secondary problems caused by the disaster. This includes organizing existing resources, generating new resources, and ensuring their most effective use (2).

The most effective method of combating disasters is pre-disaster preparedness planning. Modern disaster management systems adopt a proactive approach focused on risk reduction rather than a reactive intervention approach aimed solely at “saving lives.” (3) For this purpose, the Ministry of Health in Turkey has created the “Hospital Disaster and Emergency Plan (HAP) Preparation Guide.” This guide was prepared in accordance with international standards published by the World Health Organization (WHO) and its affiliated organizations. (4-6) In modern disaster management, hospitals are held responsible for adapting and developing exemplary approaches shared within these guidelines

to their institutions and for making all necessary preparations, plans, training, and drills in advance to ensure effective intervention during disasters and emergencies (7).

Despite the presence of HAPs in all hospitals in Turkey, the report by the Presidency of the Republic of Turkey Strategy and Budget Department dated March 3, 2023 states that in the Kahramanmaraş earthquake on February 6, 2023, 42 hospital buildings in the region—27 under the Ministry of Health, six under universities, and nine from the private sector—suffered severe and moderate damage (8). Most of these institutions were rendered non-operational during and after the earthquake.

Contemporary disaster management is commonly conceptualized as a continuous cycle of mitigation, preparedness, response, and recovery, in which the preparedness phase is most directly linked to the resilience of health systems and critical infrastructure (2,3). Within this framework, hospitals—and emergency departments in particular—function as critical infrastructure whose ability to remain operational determines a community's capacity to absorb the shock of a disaster. The HAP operationalizes the preparedness phase at the institutional level by defining

command structures, staff roles, training, and drills. Despite the formal existence of HAPs in all Turkish hospitals, little primary evidence describes how these plans are understood and implemented by frontline ED staff during a catastrophic event—a gap that the Kahramanmaraş earthquake provided an unfortunate opportunity to examine.

Accordingly, this study examines the medical and managerial practices of emergency medicine specialists, healthcare professionals, and support personnel working in the EDs of hospitals in the affected region during and after the earthquake, together with their evaluations of the HAP. Specifically, we addressed three questions: (i) to what extent were HAP protocols known and implemented in the affected EDs; (ii) how did infrastructure and personal factors, such as concern for family, affect staff functioning; and (iii) which sociodemographic factors were associated with returning to duty? In doing so, the study aims to raise awareness of the need to develop adequate and applicable HAPs.

Material and Methods

Figure 1 illustrates the selection process of participants for the study. A total of 500 emergency department (ED) staff members were identified as eligible for the study. Out of these, 300 individuals were invited to

participate in the survey. Ultimately, 189 participants completed the survey, representing the final study population.

This descriptive study examines the evaluations of HAP by healthcare professionals, including physicians, nurses, paramedics, and support staff (cleaning, security, technical personnel) working in emergency departments in cities affected by the 2023 Kahramanmaraş Earthquake.

The target sample size was determined based on the estimated number of emergency medical professionals in the affected regions and feasibility constraints.

The study was conducted over a total period of 14 months, with ethical approval obtained from the Non-Interventional Ethics Committee of Gaziantep Islam Science and Technology University on, protocol no. 293.30.02. The study was carried out in emergency departments in cities affected by the earthquake, where the study conductors resided: Gaziantep, Adıyaman, Kahramanmaraş, Şanlıurfa, Kilis, and Malatya. A structured recruitment approach was used, targeting emergency department professionals from multiple hospitals in earthquake-affected regions. While participation was voluntary, efforts were made to include a diverse and representative sample of healthcare workers.

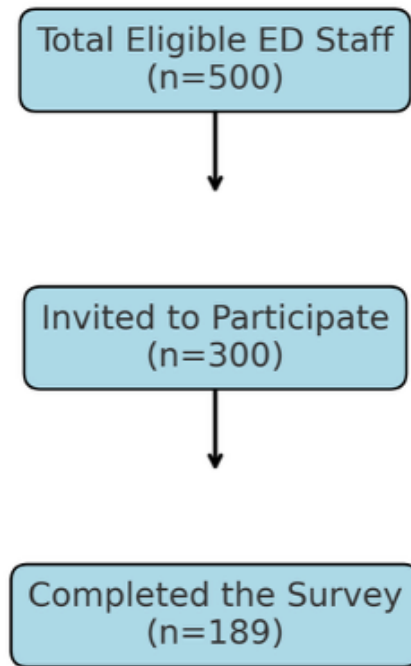


Figure 1. Participant Selection Flowchart

The survey was created as a Google Form and distributed through a link shared in the WhatsApp announcement groups of hospital emergency department staff, inviting voluntary participation. For ethical appropriateness, participants were asked to complete the form outside of working hours. Personnel who were not working in hospitals in the earthquake zone, or who were deployed from outside the region to provide support, were excluded. All survey items were mandatory, and no missing data were recorded in the dataset.

The data collection form consisted of three sections:

1. The first section contained six questions investigating sociodemographic

characteristics such as age, gender, marital status, profession, years of service, and the name of the hospital where the participant worked.

2. The second section included three questions about whether the participant was in the hospital during or after the earthquake, when they arrived at the hospital if they were not present, and the protective measures they took during the earthquake.

3. The third section contained eight questions investigating the hospital's preparedness for disasters (Question 10), the identity of the HAP Chair, the duties of their unit in HAP (Question 13), task distributions (Question 14), and whether

HAP training (Question 15) and drills (Question 16) were conducted and implemented (Question 17). Additionally, it included questions about how communication was maintained during the earthquake, whether patient evacuations were carried out, concerns for family members (Question 19) and their impact on medical work (Question 20), triage applications (Question 21), structural safety (Question 23), adequacy of medication and supplies (Question 24), power outages (Question 25), toilet adequacy and hygiene (Question 26), hospital hygiene (Question 27), heating conditions (Question 28), water accessibility (Question 29), and emergency physician opinions on patient discharges (Question 30) and rest opportunities (Question 31).

The survey consisted of 31 questions, with Questions 10, 13, 14, 15, 16, 17, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, and 31 designed in a five-point Likert scale format. Questions were developed as a semi-structured survey form by academic experts in disaster-related fields through literature review. The appropriateness of the semi-structured form was reviewed by an expert specializing in measurement and evaluation.

Our study is descriptive in nature. The results were summarized using frequency distributions. Relationships between

qualitative variables were analyzed using Fisher's Exact Test or Pearson's Chi-Square Test. Descriptive statistics were presented as count (n) and percentage (%) for categorical variables. Statistical analyses were conducted using SPSS 25.0 (IBM Corporation, Armonk, New York, United States), and a p-value of <0.05 was considered statistically significant.

Results

A total of 189 participants were included in this study, comprising 69.8% (132 individuals) male and 30.2% (57 individuals) female. The age distribution of the participants was as follows: 6.3% (12 individuals) were between 18-25 years, 49.2% (93 individuals) were between 26-35 years, 31.7% (60 individuals) were between 36-45 years, and 12.7% (24 individuals) were aged 46 years and above. In terms of marital status, 34.4% (65 individuals) were single, while 65.6% (124 individuals) were married. Participants were asked to respond to questions about their behaviors during and after the earthquake. The distribution of responses and their relationship to the earthquake are presented below.

In the "Examination of Their Status During the Earthquake (Table-1)" table, the participants' age, gender, sociodemographic characteristics, and their responses regarding their situation during the

earthquake were analyzed. It was determined that 47.1% of the participants were physicians, 31.7% had 0 to 5 years of professional experience, 36.5% arrived at the hospital within an hour after the earthquake, and 61.7% communicated via

WhatsApp. Additionally, 76.2% of the hospitals where they worked were damaged, 76.7% conducted patient evacuations, and 50.3% of the participants did not implement the drop-cover-hold position during the earthquake.

Table 1. Sociodemographic Characteristics and Earthquake Circumstances

		n (%)
Profession	Physician	89 (47.1)
	Nurse/technicians	59 (31.2)
	Support staff	41 (21.7)
Years of service	0-5	60 (31.7)
	6-10	43 (22.8)
	11-20	59 (31.2)
	20 and above	27 (14.3)
Presence at the Hospital During or After the Earthquake	Yes	160 (84.7)
	No	29 (15.3)
Time to Reach the Emergency Department	0-1 hr	69 (36.5)
	1-4 hr	61 (32.3)
	4-12 hr	15 (7.9)
	12-24 hr	13 (6.9)
	After 24 hr	31 (16.4)
Communication During and After the Earthquake	(GSM)	60 (31.6)
	Internal line	7 (4)
	WhatsApp	108 (57.1)
	Social media	4 (2.1)
	Radio devices	1 (0.5)
	other	9 (4.7)
	total=	189 (100)
Hospital Damage	Damaged	144 (76.2)
	Not damaged	45 (23.8)
Drop-Cover-Hold Practice	Did	94 (49.7)
	Did not	95 (50.3)
Patient Evacuations After the Earthquake	Yes	145 (76.7)
	No	44 (23.3)
HAP Implementation During and After the Earthquake	Yes	87 (46)
	No	102 (54)
Awareness of HAP Chairperson	Yes	58 (30.7)
	No	131 (69.3)

The opinions of the staff who participated in the study regarding developments following the earthquake are presented in

Table 2. Of the participants, 56.6% believed that their hospital was not adequately prepared for disasters, 49.2% reported not

knowing their unit's responsibilities under the Hospital Disaster Plan (HAP), and 46.6% stated that task assignments were not done properly. Furthermore, 59.8% indicated that sufficient and regular information about HAP was not provided. Only 12.2% of participants reported that HAP drills were conducted regularly in their unit, and 11.1% considered HAP adequate and applicable. While 27% of the participants believed that triage systems

were implemented in hospitals after the earthquake, 22.8% strongly disagreed with this view. Additionally, 52.3% found the number of medications and supplies available in the hospital after the earthquake sufficient, and 46% believed that patients in appropriate conditions were quickly discharged. However, only 14.3% thought that the hospitals were structurally safe after the earthquake.

Table 2. Feedback from participants on the implementation of HAP during and after the earthquake

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	n(%)	n(%)	n(%)	n(%)	n(%)
My hospital was adequately prepared for disasters.	70 (37)	37 (19.6)	40 (21.2)	20 (10.6)	22 (11.6)
I know the duties of my unit according to the HAP (Hospital Disaster and Emergency Plan)	75 (39.7)	18 (9.5)	37 (19.6)	22 (11.6)	37 (19.6)
Task distributions in HAP were properly organized	68 (36)	20 (10.6)	59 (31.2)	13 (6.9)	29 (15.3)
Sufficient and regular information on HAP was provided	83 (43.9)	30 (15.9)	36 (19)	14 (7.4)	26 (13.8)
Regular HAP drills are conducted in my department.	90 (47.6)	28 (14.8)	31 (16.4)	17 (9)	23 (12.2)
HAP is adequate and applicable	73 (38.6)	29 (15.3)	49 (25.9)	17 (9)	21 (11.1)
Triage systems were applied to all patients who visited the hospital post-earthquake.	43 (22.8)	10 (5.3)	45 (23.8)	40 (21.2)	51 (27)
My hospital was structurally safe after the earthquake.	72 (38.1)	21 (11.1)	41 (21.7)	28 (14.8)	27 (14.3)
Medications and supplies were sufficient after the earthquake.	34 (18)	20 (10.6)	36 (19)	46 (24.3)	53 (28)
Emergency physicians quickly discharged patients when appropriate post-earthquake.	20 (10.6)	8 (4.2)	38 (20.1)	36 (19)	87 (46)

When analyzing Table 3, it was observed that 60.3% of participants reported that concerns about their families negatively impacted their work performance, and

86.2% stated that they experienced concerns about their families and loved ones while working in the hospital. Additionally, 39.7% of participants reported

experiencing power outages that hindered medical operations after the earthquake. A total of 57.7% found the toilet hygiene inadequate, while 22.2% considered the general hospital hygiene sufficient. Moreover, 50.3% of participants reported

facing heating issues, and 45.5% stated having difficulty meeting their water needs. Furthermore, 70.9% of participants reported that they could not find sufficient opportunities to rest within the hospital after the earthquake.

Table 3. Feedback on Family Concerns, Basic Needs, and Hygiene Conditions Post-Earthquake

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	n(%)	n(%)	n(%)	n(%)	n(%)
Concerns about my family negatively affected my work.	30 (15.9)	13 (6.9)	32 (16.9)	27 (14.3)	87 (46)
I worried about my family and loved ones during my post-earthquake hospital shifts.	7 (3.7)	7 (3.7)	12 (6.3)	18 (9.5)	145 (76.7)
Energy outages hindered medical work post-earthquake.	37 (19.6)	33 (17.5)	44 (23.3)	25 (13.2)	50 (26.5)
Hospital toilets were sufficient and hygienic post-earthquake.	83 (43.9)	26 (13.8)	39 (20.6)	20 (10.6)	21 (11.1)
The hospital provided a hygienic work environment post-earthquake	79 (41.8)	23 (12.2)	45 (23.8)	21 (11.1)	21 (11.1)
There were heating problems in the hospital post-earthquake.	45 (23.8)	19 (10.1)	30 (15.9)	23 (12.2)	72 (38.1)
There were difficulties in accessing water in the hospital post-earthquake	48 (25.4)	23 (12.2)	32 (16.9)	24 (12.7)	62 (32.8)
All staff had sufficient opportunities to rest within the hospital post-earthquake.	105 (55.6)	29 (15.3)	24 (12.7)	6 (3.2)	25 (13.2)

Analysis of Relationships Between Participants' Presence at Their Workplace After the Earthquake and Sociodemographic Characteristics

When examining the relationships between participants' presence at their workplace after the earthquake and the implementation of the Hospital Disaster Plan (HAP), working hours, behavior during the

earthquake, profession, and other sociodemographic characteristics:

A statistically significant relationship was found between participants' gender and their presence in the hospital after the earthquake ($p=0.032$). Among those present in the hospital during the earthquake, 72.5% (116 individuals) were male, and 27.5% (44 individuals) were female. Among those

absent, 55.2% (16 individuals) were male, and 44.8% (13 individuals) were female.

No significant relationship was found between participants' professions and their presence in the hospital during the earthquake ($p=0.936$). Of those present, 47.5% (76 individuals) were physicians, 31.3% (50 individuals) were healthcare personnel, and 21.3% (34 individuals) were support staff.

No significant differences were observed based on professional experience ($p=0.985$). Among participants, 31.3% (50 individuals) had 0-5 years of experience, 23.1% (37 individuals) had 6-10 years, 31.3% (50 individuals) had 10-20 years, and 14.4% (23 individuals) had more than 20 years of experience.

Age groups showed no significant differences in the presence of participants at the hospital during the earthquake ($p=0.836$). Among those present, 6.9% (11 individuals) were aged 18-25, 48.1% (77 individuals) were aged 26-35, 31.9% (51 individuals) were aged 36-45, and 13.1% (21 individuals) were aged 46 and above.

No significant relationship was observed between marital status and presence at the hospital during the earthquake ($p=0.663$). Among those present, 66.3% (106 individuals) were married, and 33.8% (54 individuals) were single.

No significant differences were identified based on hospital damage status ($p=0.169$). Among participants whose hospitals were damaged, 74.4% (119 individuals) were present, while 25.6% (41 individuals) were in undamaged hospitals.

Family Concerns

No statistically significant differences were found between the level of agreement with the statement, "Concerns about my family negatively affected my work," and the time taken to return to duty after the earthquake ($p=0.702$). Of those who returned within 0-1 hours, 49.3% (34 individuals) strongly agreed with this statement, while 51.6% (16 individuals) of those who returned after 24 hours or more also strongly agreed.

A marginally significant relationship was found regarding the statement, "I had concerns about my family and loved ones while working in the hospital after the earthquake" ($p=0.068$). Among those who returned within 0-1 hours, 79.7% (55 individuals) strongly agreed, while 77.4% (24 individuals) of those who returned after 24 hours or more also strongly agreed.

Professional Experience and Returning to Duty

A significant relationship was identified between professional experience and the time taken to return to duty after the earthquake ($p=0.035$, $p<0.05$). Participants

with less than five years of experience and those with 10-20 years of experience had significantly higher rates of returning to the hospital within one hour compared to others. Similarly, employees with less than five years of experience also showed significantly higher rates of returning to the hospital after 24 hours compared to their counterparts.

Hospital Damage and Response Time

Employees from damaged hospitals were significantly more likely to return to their workplace within one hour or between one and four hours compared to those from undamaged hospitals ($p=0.008$, $p<0.05$). Specifically, 68.1% (47 individuals) of employees from damaged hospitals returned within one hour, and 96.8% (30 individuals) returned after 24 hours. Conversely, 31.9% (22 individuals) from undamaged hospitals returned within one hour, and only 3.2% (1 individual) returned after 24 hours

Discussion

Hospitals and emergency departments (EDs) are the first points of contact for disaster victims. The structural integrity and operational functionality of these facilities are critical for public health. Our study shows that participants did not consider their hospitals and EDs safe, with 76.2%

stating their workplaces were damaged (Table 1).

Numerous studies confirm that hospitals and EDs often lack sufficient structural resilience against earthquakes. For instance, Dennis et al. reported structural damage in 73 hospitals during the 1994 Northridge earthquake. Similarly, in earthquakes in Iran and Pakistan, 90% of healthcare facilities were damaged, whereas 60% were affected in Peru; in China, many hospitals collapsed and became non-operational for medical services (9).

Structural damage to hospitals inevitably necessitates the evacuation of inpatients. These evacuations should be managed according to a triage system and hospital capacity. In this context, emergency departments (EDs) should promptly discharge green zone patients on an outpatient basis, while all inpatients should be transferred accordingly. In our study, 76.7% of hospitals were evacuated, and 68% of emergency physicians rapidly discharged suitable patients. However, only 48.2% of participants reported implementing a triage system during these procedures (Table 1 and Table 2).

Several studies in the literature indicate that hospital evacuations and triage applications are commonly performed during disasters (10).

Our study also revealed that a significant majority of participants reported that triage systems were not fully implemented (Table 1 and Table 2). This finding highlights a critical gap in the management of disaster scenarios, where an effective triage process is essential for organizing patient care and ensuring the optimal use of available resources. Addressing this gap requires enhancing staff training and establishing clear, actionable protocols to improve the implementation of triage during emergencies.

In addition to structural damage, non-structural failures—such as power outages, water shortages, ventilation system failures, and information and communication technology disruptions—can also compromise healthcare services (11,12). In the United States, the annual probability of in-hospital crisis and disaster events (IHCDs) due to non-structural factors is 0.33%, and in the Netherlands, 134 IHCD incidents leading to emergency department closures were reported between 2000 and 2020 (12).

Our study found that power outages following the earthquake significantly disrupted medical operations, compounding non-structural damage with structural failures. In addition to medical challenges, power outages led to severe heating problems (Table 3). However, unlike some

previous reports, our study did not identify shortages in medications or medical supplies (11). This may be attributable to Turkey's robust stockpiling systems for pharmaceuticals and medical materials.

Our study found that 50.3% of participants did not implement the drop-cover-hold maneuver during the earthquake. This proportion is high among healthcare professionals; however, neurophysiological studies indicate that individuals tend to exhibit intense emotional responses to traumatic stress when facing unpredictable threats (13). It is therefore possible that, despite being healthcare professionals, participants failed to act deliberately because of the strong traumatic stress induced by the earthquake. Moreover, several studies have reported that healthcare professionals have limited knowledge of and competencies in disaster preparedness (14). The high proportion of participants who did not perform drop-cover-hold may also be linked to insufficient knowledge and training.

Our study found that most participants believed their hospitals were not adequately prepared for disasters. Participants also reported insufficient knowledge of the Hospital Disaster and Emergency Plan (HAP) and a lack of regular drills (Table 2). The literature supports that HAP awareness among healthcare workers is a critical factor

in disaster preparedness, and studies have consistently reported that healthcare professionals feel unprepared for disasters and lack confidence in their ability to respond effectively (15). Lakbala et al. found that, although 87.5% of participants had knowledge of the HAP, 75.5% were unaware of the hospital's emergency warning system, and only 17% had received disaster-management training (16). Our findings are consistent with this, as 69.3% of our participants did not know who their HAP chairperson was (Table 1). HAP awareness and regular disaster drills reduce uncertainty and improve disaster-preparedness perceptions (15,21). Previous studies suggest that hospitals should conduct at least three drills per year in accordance with HAP guidelines (16); in our study, however, only 12.2% of participants reported that regular drills were conducted in their departments (Table 2).

A sudden surge in patient numbers following a disaster places enormous strain on emergency departments, and the availability of sufficient, well-trained personnel is a key factor in managing such crises (17). In large-scale disasters, the personal impact on hospital staff and their families directly affects workforce availability. Healthcare professionals who report for duty may experience significant distress because of concerns for their

families and a lack of access to basic necessities such as water, food, shelter, heating, and hygiene. This not only undermines healthcare service delivery but also constitutes a major barrier preventing healthcare workers from continuing their duties (18,19). Ensuring that healthcare workers' basic needs are met during disasters is crucial to allow them to focus on patient care, and providing essential resources within hospitals and EDs may encourage staff to return to work (19). Our study found that 86.2% of participants were concerned about their families while on duty, and 60.3% reported that these concerns negatively affected patient care (Table 3).

A statistically significant relationship was found between gender and returning to duty after the earthquake, with female healthcare workers being less likely to return to their workplaces than male staff. Similarly, Shapira et al. studied a missile attack that increased hospital admissions and found that male staff, parents of children older than 14 years, and those in managerial positions were more likely to return to work (20). Although natural and human-made disasters differ substantially, both studies indicate that female healthcare workers are less willing to return to hospitals after a disaster. This may be attributable to gendered caregiving responsibilities, as

women are often expected to assume primary childcare and eldercare roles (18,20,22).

Many disaster-response plans focus on maintaining emergency operations but often overlook the well-being and quality of life of personnel (22). In our study, 39.7% of participants reported power outages, while only 22.2% considered hospital hygiene adequate. In addition, 50.3% reported heating problems, 57.7% found toilet hygiene inadequate, 45.5% struggled to meet their water needs, and 70.9% stated that they did not have sufficient opportunities to rest (Table 3). These findings indicate that post-disaster living conditions for hospital and ED staff were markedly suboptimal. Similarly, Ochi et al. studied hospital personnel after the 2011 Japan earthquake and identified basic unmet needs—such as food, fuel, and transportation—as major barriers to staff returning to work (23).

Our study did not specifically investigate food access, which is a limitation. However, based on participant feedback, we observed that many staff faced difficulties in accessing food, especially hot meals, post-disaster. This study used a voluntary sampling method via digital communication platforms, which may introduce selection bias by favoring respondents with greater digital access and willingness to participate.

The findings of this study reflect the experiences of emergency medical professionals in hospitals affected by the Kahramanmaraş Earthquake. However, generalizability to other disasters may be limited due to differences in healthcare infrastructure, preparedness levels, and resource availability in different regions.

Our findings also indicate that healthcare workers arrived at damaged hospitals more quickly and that most of those who responded were newly trained professionals. This suggests that emergency department personnel may be particularly sensitive and responsive in disaster situations.

Conclusion

This study identified significant gaps in hospital disaster preparedness, including limited awareness of HAP protocols (reported by 69.3% of respondents), inadequate disaster training (59.8%), and infrastructure vulnerabilities such as power and water shortages. Translating these findings into practice, we recommend that hospitals (i) designate and publicly identify the HAP chairperson and unit-level responsibilities so that every ED staff member can name them; (ii) conduct at least three documented, scenario-based disaster drills per year, as specified in HAP guidelines; (iii) protect non-structural systems—power, heating, water, and

sanitation—through redundant supplies and periodic Hospital Safety Index assessments; and (iv) embed staff-support measures, including family-communication and welfare provisions, into the HAP to sustain workforce availability.

Effective disaster management depends on HAPs that are based on international standards, regularly reviewed, and adapted to evolving risks. Ensuring that the basic needs of healthcare workers are met during disasters is equally essential to keep them focused on patient care.

Further research—ideally multicenter and prospective—is needed to assess the long-term impact of disasters on health systems and to validate standardized protocols for hospital disaster management.

Author Contribution

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Conflict of Interest

The authors declare that they have no conflict of interest.

Ethics Committee Approval

This study was approved by the Gaziantep Islam Science and Technology University Ethics Committee (Approval Reference Number: 293.30.02).

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