

Predictors of Disaster Readiness Perceptions among Emergency Department Nurses in the Eastern Region of Saudi Arabia

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Abstract

Background: Nurses play a crucial role in disaster response within emergency departments; however, limited evidence exists regarding their knowledge and skills in performing this role effectively.

Aim: This study aimed to explore emergency nurses' perceptions of their role in disaster management across selected hospitals in the eastern region of Saudi Arabia.

Methods: A descriptive cross-sectional design was used, involving a convenience sample of 150 emergency nurses from seven private hospitals in the region. Data collection was conducted over one month (1–31 October 2025) using a validated short-form electronic questionnaire adopted from a previous study and analyzed using SPSS version 30.

Results: The primary roles identified during disaster management included patient assessment and care, triage, leadership, resuscitation, and psychological support. Nurses demonstrated a high perception of their essential role in disaster response, with confidence and adequate knowledge. Married nurses reported significantly higher disaster role perception scores than single nurses ($p < 0.01$).

Conclusions: Emergency nurses are fundamental to disaster response efforts and possess satisfactory knowledge of their roles in management in the eastern region of Saudi Arabia. Continuous education and targeted training programs are recommended to enhance preparedness and strengthen the effectiveness of emergency nursing practice in disaster situations.

Keywords: Emergency Nurses; Nurses' Perception; Disaster Preparedness; Saudi Arabia.



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1. INTRODUCTION

Emergencies are situations in which normal regulatory requirements cannot be temporarily met, and immediate action is required due to a potential threat to public health (Sunshine et al., 2019). These emergencies usually result due to disasters, like natural disasters (Tornadoes and severe storms, hurricanes and tropical storms, floods, wildfires, earthquakes, and drought), Human-Caused Disasters, such as incidents of mass violence, wars, and nuclear missiles, or other incidents of mass trauma such as infectious disease outbreaks like COVID-19 outbreak (Jacobs - Wingo et al., 2019; Shi, 2019). The World Health Organization (WHO) defined a disaster as a sudden ecological event of such severity that it overwhelms local capacity and necessitates assistance from external sources (Makwana, 2019).

In the emergency department, nurses may confront a wide range of disasters, including natural events (such as floods, sandstorms, heat waves, and earthquakes), technological/ industrial incidents (chemical spills, explosions, fires, radiation leaks), and human-made crises (mass-casualty traffic accidents, building collapses, acts of violence, and terrorism) (Elkhouly et al., 2024). The healthcare environment nowadays is highly complex, and the nature of emergency nursing practice necessitates adequate orientation and practice in dealing with a wide array of patient conditions, supplies, equipment, procedures, policies, and processes (Rowe & Knox, 2023). Nurses working in emergencies should be able to quickly assess and analyze the patient's problems systematically and professionally and develop solutions that prioritize urgent intervention. Emergencies require advanced, specialized knowledge to be managed effectively, including proficiency with critical equipment and disaster supplies (Zhang et al., 2024). In disaster situations, nurses must be able to use and coordinate key resources such as airway and breathing equipment (oxygen delivery systems, bag-valve masks, suction devices), monitoring devices (cardiac monitors, pulse oximeters, blood pressure equipment), resuscitation and trauma supplies (defibrillators, IV access and fluids, dressings, splints), medications (emergency drugs, analgesics, sedatives), and personal protective equipment and isolation materials (Ghimire & Ghimire, 2025). Access to adequate logistical supplies, communication tools, and basic life-support materials is also essential to support safe, timely, and effective nursing interventions during disasters (Bekman & Benbenishty, 2025).

Nurses comprise the largest share of the healthcare workforce and would likely be the recipients of an emergency patient (Hassmiller & Wakefield, 2022). In such situations, the nurse's main role is to ensure rapid, safe, and coordinated care: performing triage and initial assessment, stabilizing and resuscitating critically

ill or injured patients, administering medications and treatments, monitoring vital signs, and continuously reassessing priorities as new casualties arrive. Emergency nurses also play key roles in implementing the hospital disaster plan, communicating with the multidisciplinary team and families, maintaining infection-prevention and safety measures, and providing psychological support to patients, relatives, and colleagues throughout and after the event (Noh & Bae, 2025).

Education curriculum should play a central role in developing core actions to improve interventions in emergencies, including training nurses and health workers for emergencies, improving emergency response in health facilities, and maintaining inventories for medical equipment and supplies for emergency interventions, mass casualties, and disaster management (Alrabie et al., 2025; Hamdi & Al Thobaity, 2023; Lin et al., 2024). However, schools of nursing offer little information on disaster response, and there is no standardized, evidence-based, multidisciplinary training for emergency response (AlOtaibi et al., 2024; White et al., 2025). Research has assessed the development of nursing competencies in students before and after internship programs (Hindriyastuti et al., 2019), and other studies have examined the level of competence demonstrated by nursing professionals in emergencies (Manero-Solanas et al., 2024). Across this literature, several factors consistently influence nurses' disaster-related roles, competencies, and knowledge, including the amount and quality of formal disaster education, participation in drills and simulations, prior experience with real disaster events, organizational support and clear role descriptions, availability of resources and equipment, and individual characteristics such as years of experience, specialty training, and self-efficacy. These factors collectively shape how confidently and effectively nurses perform their roles during disasters (da Conceição Gatinho Pires et al., 2026; Feng et al., 2025).

Saudi hospitals lack structured transition programs to develop these competencies in newly graduated nurses. Consequently, limited practical disaster training during undergraduate education means many graduates are not fully prepared to respond effectively to emergencies and disasters. In the absence of targeted emergency response interventions in clinical practice, nurses may experience role confusion and default to traditional bedside care during catastrophic events, rather than undertaking specialized responsibilities such as promoting recovery and critically evaluating the situation (Alzahrani & Kyratsis, 2017).

This research aimed explore emergency nurses' perceptions of their role in disaster management across selected hospitals in the eastern region of Saudi Arabia.

1.1 Theoretical framework

The theoretical framework for this study integrates a social-behavioral perspective with a mid-range nursing theory. Disaster readiness perceptions are conceptualized as nurses' cognitive appraisal of their own competencies—knowledge, expertise, and clinical judgment—in relation to the demands of emergency and disaster settings. Within this view, readiness reflects not only what nurses know, but also how confident they feel in mobilizing that knowledge under time pressure and uncertainty.

First, the theory of human behavior in the social environment (Sharma & Gupta, 2026) provides a broad lens to understand how both individual attributes and contextual factors shape nurses' disaster-related behaviors and perceptions. In emergency departments, nurses' responses are embedded in social norms, team dynamics, institutional policies, and the wider sociocultural and organizational environment, including the specific disaster risks and mass gathering context in Saudi Arabia. This theory supports examining individual variables (e.g., training, experience, prior disaster exposure) alongside contextual influences when exploring predictors of perceived readiness.

Second, the mid-range nursing theory of wisdom-in-action (Glück & Brienza, 2025; Matney et al., 2020) is adopted as the primary guiding framework. Wisdom-in-action describes how nurses integrate knowledge, experiential learning, and clinical judgment to make timely, appropriate decisions in complex and uncertain situations. In disasters and other high-acuity emergencies, there is limited time for extensive assessment; nurses must rapidly interpret clinical cues, rely on established cognitive schemas, and implement interventions with precision and confidence. From this perspective, disaster readiness perceptions represent nurses' self-evaluation of their capacity to enact wisdom-in-action when confronted with unpredictable, high-pressure events.

In line with these frameworks, the study focuses on disaster-related competencies—such as prior disaster education, clinical experience, perceived knowledge, and confidence—as key predictors of perceived disaster readiness among emergency department nurses. The social-behavioral perspective emphasizes attention to the contextual characteristics of the Eastern Region of Saudi Arabia (e.g., mass gatherings, organizational preparedness). At the same time, wisdom-in-action highlights the central role of knowledge integration and decision-making under uncertainty. Together, these theories provide a coherent basis for selecting study variables and interpreting how individual and contextual factors shape nurses' perceptions of disaster readiness.

1.2 Significance of the study

Despite the central role of frontline nurses in hospital emergency departments (EDs) during disaster response, studies found that nurses still have limited knowledge of the skills and expertise required to perform emergency clinical roles effectively in disaster management (Murphy et al., 2021). Little is known about their perception and understanding of their role during disaster management to perform this important clinical role effectively. In particular, there is a paucity of Saudi studies that directly measure emergency nurses' disaster preparedness (AlDulijand et al., 2023; Alzahrani & Kyratsis, 2017; Banaser et al., 2020), especially in the eastern region of Saudi Arabia. The Eastern Region of Saudi Arabia represents a critical setting for advancing emergency care research due to its unique demographic and geographical characteristics. This region is expected to host a substantial number of visitors during the FIFA World Cup 2034, significantly increasing population density and placing considerable demands on emergency healthcare services. In addition, the region is known for its diverse recreational activities and large-scale events, which regularly attract both domestic and international visitors to relatively confined areas. Such conditions heighten the risk of mass gatherings, injuries, and public health emergencies, thereby underscoring the urgent need for context-specific research to enhance preparedness, optimize emergency response systems, and ensure the safety and well-being of both residents and visitors. Therefore, the current study was imperative to assess nurses' perceptions of their roles during disaster management, especially given the dramatic circumstances in countries surrounding Saudi Arabia, which certainly increase the likelihood of future disasters requiring emergency management, God forbid.

1.3 Aim of the study

This study aimed to explore emergency nurses' perceptions of their role in disaster management across selected hospitals in the eastern region of Saudi Arabia.

Thus, the following are the objectives of this research:

1. To assess the sociodemographic characteristics of the participant emergency nurses.
2. To explore nurses' perception of their roles during disaster management at the Emergency Departments of Eastern Region Hospitals.
3. To identify the predictors of nurses' perception of their role during disaster management based on various sociodemographic characteristics.

1.4 Research question:

What are nurses' perceptions of their roles in disaster management within the emergency departments of hospitals in the Eastern Region of Saudi Arabia?

Which sociodemographic factors predict nurses'

perceptions of their roles in disaster management?

2. METHODOLOGY

- **Research design:** A descriptive, cross-sectional design was used for the current study.
- **Research Setting:** The emergency departments of selected private hospitals in the eastern region served as the setting for the current study, including Almana General Hospitals (AGH Dammam, AGH Aziziah, AGH Dammam, AGH Khobar, AGH Jubail, and AGH Hofuf) and Dar Afia Hospital. In addition to the convenience for the researcher, the hospitals were chosen for their large emergency departments, large staff, modern facilities, and staff cooperation.

2.1 Sample selection

A non-probability convenience sampling approach was used in this study. All accessible nurses with more than 6 months of experience in the emergency departments of the selected hospitals, regardless of nationality or gender, were invited to participate and constituted the study sample. The estimated total number of nurses working in the emergency departments of the seven hospitals was 200, of whom 182 met the eligibility criteria. The sample size was calculated using OpenEpi (Version 3) for a finite population of 200 nurses, assuming a 50% expected proportion, a 95% confidence level, 5% precision, and a design effect of 1, yielding a minimum required sample of 132 nurses. Multiple reminders and support from nurse managers were used to enhance participation and reduce non-response bias. Ultimately, 150 nurses completed the survey, yielding a response rate of 82.4%, exceeding the minimum required sample size and adequate to achieve the targeted statistical power.

2.2 Instruments

The study used a short-form, self-administered questionnaire adopted from a previous study conducted in Makkah, Saudi Arabia (Alzahrani & Kyratsis, 2017). The tool consisted of two parts: the first covered sociodemographic variables, and the second assessed nurses' perceptions of the emergency nurse's role in disaster management using 12 statements rated on a five-point Likert scale (from strongly agree to strongly disagree).

The original English questionnaire was used without modification. It was piloted with 20 emergency nurses from the same setting before large-scale distribution to ensure clarity of language and the absence of errors. As no substantial modifications were required, the pilot data were included in the final analysis. The tool had previously demonstrated validity and internal consistency in a Saudi Arabian study (Alzahrani & Kyratsis, 2017). In the current study, test-retest reliability was assessed using the pilot sample, and the questionnaire showed acceptable reliability (Cronbach's $\alpha = 0.87$).

2.3 Data Collection Procedure

Data collection was conducted by distributing an electronic Microsoft Forms questionnaire to a convenience sample of nurses over one month (1–31 October 2025) via email, WhatsApp, and other online platforms. Data collection commenced after obtaining ethical approval to conduct the study. The questionnaire began with a cover letter that introduced the researcher, outlined the aim of the study, described the procedures, potential benefits, and possible inconveniences associated with participation, and clearly explained that participation was voluntary, anonymous, and confidential. The cover letter also emphasized participants' autonomy, including their right to decline without any consequences.

Before accessing the main questionnaire, participants were explicitly asked whether they were willing to take part in the study. They were required to indicate their agreement electronically before proceeding, and this was considered informed consent. Registration using the participant's email address was required within Microsoft Forms solely to prevent duplicate responses; however, email addresses were not stored or linked to the dataset, and no personally identifying information was collected, thereby ensuring that all responses remained fully anonymous.

2.4 Ethical issues

Before conducting this research, approval was secured from the Institutional Review Board (IRB) of Mohammed Al-Mana College for Medical Sciences (IRB No. SR/RP/103) and Dar Afia Hospital (ethics approval No. DA-077/022/140) on May 12, 2025. In dealing with respondents, informed consent was obtained after the purpose and scope of the study were extensively explained on the survey cover page. Participants' acceptance without coercion to participate in the current study and to fill out the electronic questionnaire was considered informed consent. All respondents participated voluntarily in the study without coercion and were free to withdraw without any consequences. Respondents were not exposed to any harmful procedures or deceptions. Study participants were sufficiently protected from misuse of their data by the use of anonymous questionnaires.

2.5 Data analysis

Retrieved data from Microsoft Forms were then revised, coded, and analyzed using the Statistical Package for Social Sciences (SPSS), version 30 (IBM Corp, 2024). Data were presented using descriptive statistics, such as the mean and standard deviation, or number and percentage. The mean and standard deviation were used for continuous variables, whereas numbers and percentages were used for categorical variables. Additionally, regression analysis was conducted to identify significant independent predictors of the nurses' perception of the disaster management role, and P values were considered significant at 0.05 or lower.

3. RESULTS

Table 1 presents the sociodemographic characteristics of the 150 participating emergency nurses. The majority of participants were aged between 25 and <30 years (34.0%), followed by those aged 30 to <35 years (27.3%). Most respondents were Saudi nationals (72.7%) and females (61.3%). Regarding marital status, more than half were married (65.3%).

In terms of job title, nurse specialists accounted for the largest proportion (61.3%), followed by nursing technicians (15.3%), in-charge nurses (9.3%), head nurses (6.7%), and nursing supervisors (7.3%). The majority of participants had 5-9 years of experience (42.0%), followed by those with 6 months to <5 years (28.7%). Regarding educational attainment, most held a Bachelor of Nursing degree (67.3%), with fewer holding a nursing diploma (24.7%) or a postgraduate qualification (8.0%).

Table 1: Sociodemographic characteristics of the participants (N=150)

Sociodemographic data		n (%)
Age	<25 years	9 (6.1%)
	25 to <30 years	51 (34.0%)
	30 to <35 years	41 (27.3%)
	35 to <40 years	28 (18.7%)
	40 to <45 years	14 (9.3%)
	45 years or more	7 (4.6%)
	Total	150 (100.0%)
Nationality	Saudi	109 (72.7%)
	Non-Saudi	41 (27.3%)
	Total	150 (100.0%)
Gender	Male	58 (38.7%)
	Female	92 (61.3%)
	Total	150 (100.0%)
Marital status	Single	52 (34.7%)
	Married	98 (65.3%)
	Total	150 (100.0%)
Job title	Nursing Technician	23 (15.3%)
	Nurse Specialist	92 (61.3%)
	In-charge nurse	14 (9.3%)
	Head Nurse/Assistant	10 (6.7%)
	Nursing supervisor	11 (7.3%)
	Total	150 (100.0%)
Years of experience	6 months - < 5 years	43 (28.7%)
	5-9 years	63 (42.0%)
	10-14 years	35 (23.3%)
	15-19 years	5 (3.3%)
	20 years or more	4 (2.7%)
	Total	150 (100.0%)
Educational level	Nursing Diploma	37 (24.7%)
	Bachelor of Nursing	101 (67.3%)
	Postgraduate education	12 (8.0%)
	Total	150 (100.0%)

Figure 1 showed that most participants reported that their likely role in disaster management would be general patient assessment and care (41.3%), followed by triage (21.3%) and leadership (20.7%). Resuscitation

was selected by 14.0% of respondents, while only a small proportion indicated psychological care as their likely role (2.7%). Each participant selected a single role, and the categories were mutually exclusive.

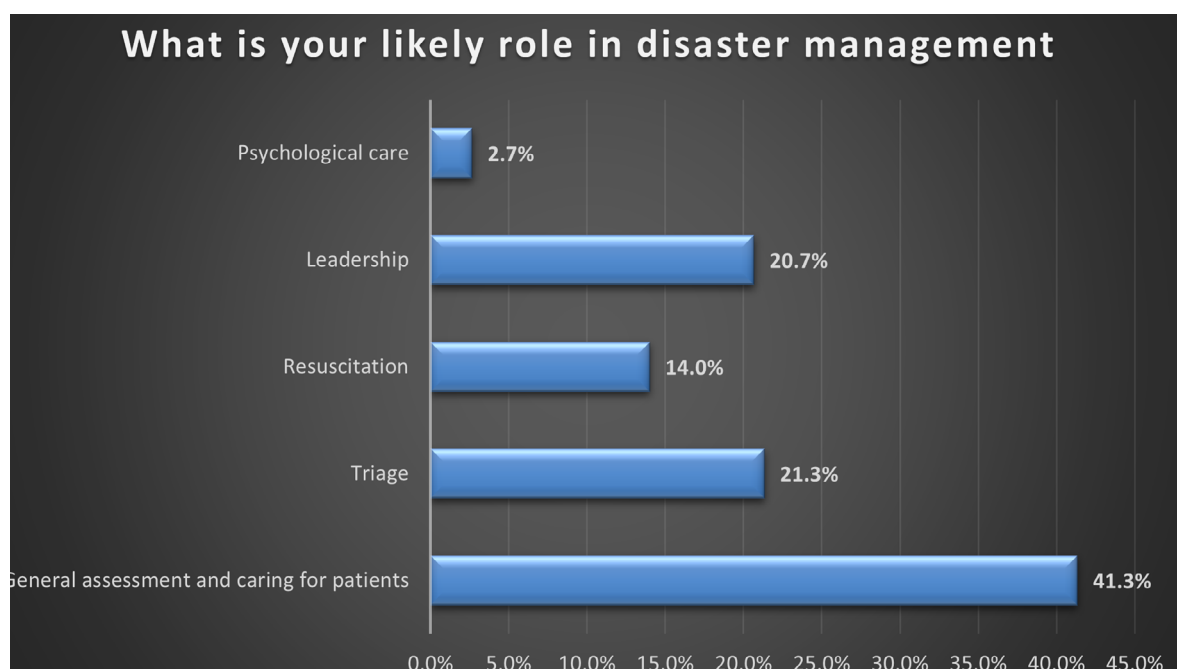


Figure 1: participants' most likely role in disaster management (N=150)

Table 2 showed that nurses generally held positive perceptions of emergency nurses' roles in disaster management, with the highest agreement for being key players in disasters (mean 3.75 ± 1.29) and for being confident and knowledgeable in responding effectively (3.60 ± 1.37). Moderate agreement was reported for roles related to general assessment and caring, timely response, communication, triage, resuscitation, surveillance,

prevention, leadership, and psychological care, with mean scores ranging approximately from 3.05 to 3.40. Overall, 51.2% of respondents (agree and strongly agree) expressed favorable perceptions across items, with an overall mean perception score of 3.29 ± 1.26 , indicating a generally positive but not strongly unequivocal perception of emergency nurses' disaster roles.

Table 2: Perception of the roles of Emergency nurses during disaster management

Items	Strongly disagree	Disagree	Neither	Agree	Strongly agree	Mean $\pm$ SD
	n (%)	n (%)	n (%)	n (%)	n (%)	
1. Emergency nurses are confident and knowledgeable in effectively responding to a disaster.	16 (10.7%)	24 (16.0%)	14 (9.3%)	46 (30.7%)	50 (33.3%)	3.60 ± 1.37
2. Emergency nurses are key players in a disaster.	13 (8.7%)	16 (10.7%)	21 (14.0%)	46 (30.7%)	54 (36.0%)	3.75 ± 1.29
3. The main role of emergency nurses during disasters is to provide general assessment and care for patients.	14 (9.3%)	30 (20.0%)	20 (13.3%)	54 (36.0%)	32 (21.3%)	3.40 ± 1.28
4. Emergency nurses are able to provide timely responses to emergency situations.	14 (9.3%)	23 (15.3%)	34 (22.7%)	51 (34.0%)	28 (18.7%)	3.37 ± 1.22
5. The main role of emergency nurses during disasters is to provide resuscitation.	15 (10.0%)	39 (26.0%)	25 (16.7%)	51 (34.0%)	20 (13.3%)	3.15 ± 1.23

Items	Strongly disagree	Disagree	Neither	Agree	Strongly agree	Mean $\pm$ SD
	n (%)	n (%)	n (%)	n (%)	n (%)	
6. The main role of emergency nurses during disasters is to provide triage and initial consultation.	21 (14.0%)	24 (16.0%)	35 (23.3%)	49 (32.7%)	21 (14.0%)	3.17 $\pm$ 1.26
7. During disasters, emergency nurses are responsible for providing direct clinical care and treatment to affected patients.	15 (10.0%)	44 (29.3%)	26 (17.3%)	48 (32.0%)	17 (11.3%)	3.05 $\pm$ 1.21
8. Emergency nurses can effectively communicate with patients, families and other clinicians to provide therapies during emergency situations.	11 (7.3%)	33 (22.0%)	25 (16.7%)	50 (33.3%)	31 (20.7%)	3.38 $\pm$ 1.24
9. During disasters, emergency nurses are responsible for surveillance.	16 (10.7%)	30 (20.0%)	37 (24.7%)	49 (32.7%)	18 (12.0%)	3.15 $\pm$ 1.19
10. During disasters, emergency nurses are responsible for prevention.	19 (12.7%)	37 (24.7%)	27 (18.0%)	44 (29.3%)	23 (15.3%)	3.10 $\pm$ 1.29
11. The main role of emergency nurses during disasters is to act as team leaders.	13 (8.7%)	39 (26.0%)	26 (17.3%)	49 (32.7%)	23 (15.3%)	3.20 $\pm$ 1.23
12. The main role of emergency nurses during disasters is to provide psychological care.	22 (14.7%)	29 (19.3%)	32 (21.3%)	41 (27.3%)	26 (17.3%)	3.13 $\pm$ 1.32
Overall perception score (mean of items)						3.29 $\pm$ 1.26

Figure 2 revealed that nurses generally had a positive perception of all listed emergency roles during disaster management, with mean scores clustered in the mid to upper range of the scale.

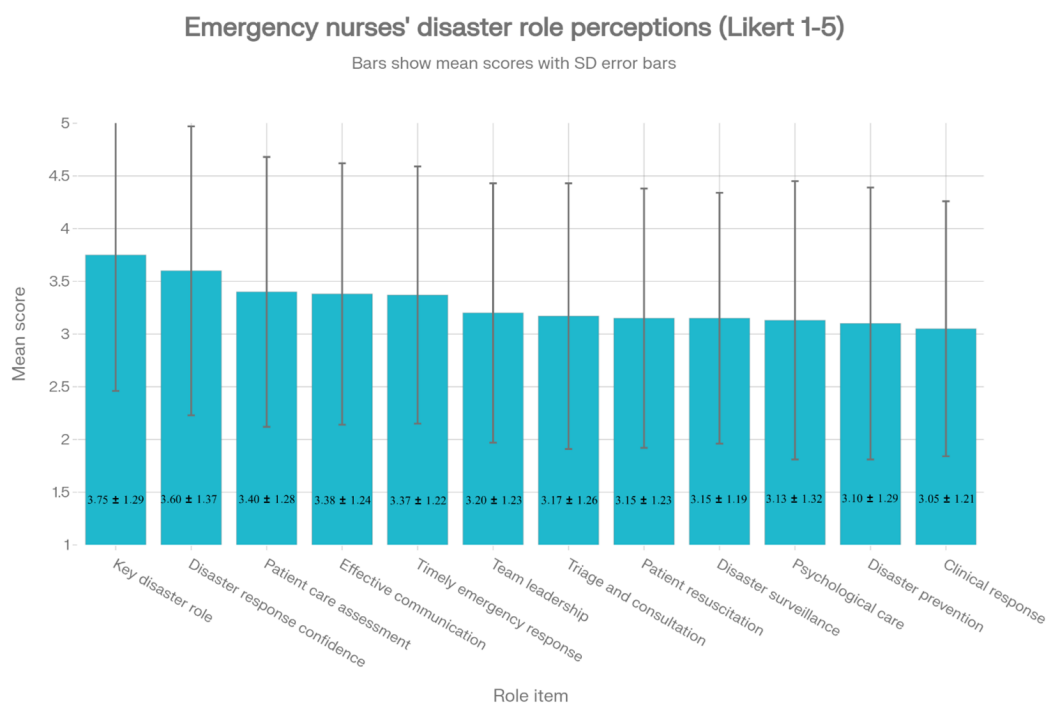


Figure 2. Perception of the roles of Emergency nurses during disaster management

Table 3 shows that, among the examined variables, only marital status significantly predicted nurses' perception of disaster management ($B = 0.512$, $p = 0.008$, $CI = 95\%$), with married nurses reporting higher perception scores than single nurses (3.50 ± 0.95 vs. 2.88

± 1.01). The regression coefficients for age, nationality, gender, job title, years of experience, and educational level were not statistically significant, indicating that these factors did not meaningfully influence perception scores in this model.

Table 3. Multiple linear regression for the predictors of nurses' perception of disaster management

ANOVA Model		Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	17.277	7	2.468	2.581	.016b	
	Residual	135.781	142	0.956			
	Total	153.058	149				
Multiple Linear Regression Model		Mean $\pm$ SD B	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			Std. Error	Beta			
(Constant)			1.764	0.489		3.608	0
Age	<25 years	2.78 $\pm$ 1.07	0.02	0.080	0.026	0.254	0.800
	25 to <30 years	3.16 $\pm$ 1.02					
	30 to <35 years	3.40 $\pm$ 1.02					
	35 to <40 years	3.39 $\pm$ 1.06					
	40 to <45 years	3.50 $\pm$ 0.69					
	45 and more	3.10 $\pm$ 1.33					
Nationality	Saudi	3.16 $\pm$ 1.03	0.326	0.230	0.144	1.416	0.159
	Non-Saudi	3.62 $\pm$ 0.90					
Gender	Male	3.17 $\pm$ 1.08	-0.044	0.208	-0.021	-0.213	0.831
	Female	3.36 $\pm$ 0.97					
Marital status	Single	2.88 $\pm$ 1.01	0.512	0.190	0.241	2.699	0.008*
	Married	3.50 $\pm$ 0.95					
Job title	Nursing Technician	3.01 $\pm$ 0.78	0.068	0.086	0.070	0.796	0.427
	Nurse Specialist	3.38 $\pm$ 1.06					
	In-charge nurse	2.86 $\pm$ 0.97					
	Head nurse	3.17 $\pm$ 1.05					
	Nursing supervisor	3.76 $\pm$ 0.88					
years of experience	6 months - less than 5 years	3.11 $\pm$ 1.03	-0.007	0.106	-0.006	-0.063	0.950
	5-9 years	3.54 $\pm$ 1.05					
	10-14 years	3.03 $\pm$ 0.89					
	15-19 years	2.93 $\pm$ 0.40					
	20 years or more	4.00 $\pm$ 1.02					
Educational level	Nursing Diploma	3.08 $\pm$ 0.98	0.070	0.185	0.038	0.379	0.705
	Bachelor of Nursing	3.31 $\pm$ 1.04					
	Postgraduate education	3.73 $\pm$ 0.75					

- Dependent Variable: Mean of Total Scores
- Predictors: (Constant), Educational level, Age, Gender, Job title, Marital status, years of experience, Nationality
- Significant at < 0.05

Marital status was the only sociodemographic variable that significantly predicted nurses' perception scores ($p < 0.05$); all other predictors in the model were not statistically significant.

4. DISCUSSION

The importance of this study lies in its focus on exploring emergency nurses' perceptions of their roles in disaster management and identifying the key predictors of these perceptions in Saudi Arabia.

Perceived Roles of Emergency Nurses in Disaster Management

The majority of nurses reported assuming general patient assessment and care, followed by triage, leadership roles, and resuscitation; the least-reported emergency nurse role was psychological care for disaster victims.

A similar study was conducted to assess emergency nurses' disaster preparedness during mass gatherings at Mecca hospitals, based on their perceptions. The study similarly showed that emergency nurses perceived their dominant role as providing general assessment and patient care (38%), followed by triage (26%) and resuscitation (21%). In contrast, the respondents gave lower priority to their leadership role during disaster management (Alzahrani & Kyratsis, 2017). Most respondents agreed that nurses are responsible for frontline triage, patient communication, administering first aid, and conducting assessments, with over half supporting each role (Olofinbiyi et al., 2020).

Nurses in the emergency and intensive care units of the provincial hospital in Indonesia demonstrated a generally good understanding of disaster emergency preparedness information, particularly in triage and basic first aid, detection of biological agents, and communication and connectivity, but showed comparatively lower understanding in epidemiology and clinical decision making, indicating specific knowledge gaps that need to be addressed to optimize

disaster response (Husna et al., 2022).

A study in Palestine found that emergency nurses in the Gaza Strip had a high role perception during disasters (81.5%) and strong disaster management knowledge (78%), reflecting confidence, participation in emergency plans, and updated experience (Saidam & Eljedi, 2020). On the contrary, a systematic review analyzed 62 studies across five major databases to assess critical care nurses' preparedness for disasters and found that nurses are generally underprepared for disastrous situations. These apparently conflicting findings may be partly explained by methodological and contextual differences. The Palestinian study was a single-country, cross-sectional survey focusing on self-reported role perceptions and knowledge among emergency nurses working in a setting of recurrent armed conflict and mass-casualty events, which may heighten perceived readiness through repeated exposure and frequent involvement in disaster response. By contrast, the systematic review pooled studies from diverse countries, healthcare systems, and clinical settings, many of which experience less frequent large-scale disasters, variable access to formal disaster training, and differing preparedness standards, which can lower average preparedness scores when combined. Our findings align more closely with the broader systematic evidence of under-preparedness, yet the Palestinian study highlights how repeated disaster exposure and strong role identity can lead to higher perceived readiness, underscoring the importance of considering both objective preparedness and contextual factors when interpreting nurses' disaster-related competencies.

Four main themes of disaster competence emerged: clinical critical care skills, operational readiness and coordination, public responsibility in disaster preparedness, and personal or intrinsic capacities for effective disaster response (van Esch et al., 2026).

There is potential to improve disaster readiness, national surge capacity, and community resilience, according to a United States study on the role of nurses as leaders in disaster planning and response. Nurses make up most of the healthcare workforce. The group of national institutions created a vision for the future of professional disaster nursing while also identifying potential and current impediments. The page summarizes a wide range of recommendations for nursing practice, education, legislation, and research, as well as implementation difficulties (King, 2022).

The literature agrees that nurses play a vital role in disaster response. Still, some studies, such as Köhler et al. (2026), highlight the lack of a clear mandate defining their specific responsibilities. The literature on nurses' roles in disaster management highlights three interrelated domains: their roles during emergency response, their knowledge and preparedness, and their lived experiences during disasters. Roles during response encompass hospital and public expectations, general and specialized nursing functions, assigned medical tasks (including during pandemics), role conflict, and willingness to respond. Knowledge-related themes include understanding what constitutes a catastrophe, core disaster competencies, the adequacy of undergraduate and continuing education, and participation in drills and training. Experiences during disasters involve the work environment, the nature of care provided, emotional responses, stressors, willingness to assist, lessons learned, and overall impact. Consistent with these themes, recent qualitative work with first-responder nurses in the Turkish earthquakes shows that nurses face major practical and psychosocial challenges, such as ineffective crisis management, poor communication, resource shortages, and emotional burden, alongside positive experiences like professional satisfaction and team support, underscoring the need to strengthen disaster preparedness and management strategies to support nurses' roles (Açık & Yeşilyurt Sevim, 2025).

Another review of the literature found that continuing education programs and undergraduate nursing courses should consider whether theoretical and practical training in disaster nursing competence is appropriate (Hung et al., 2021). The literature also highlighted concerns about the preparedness of emergency department nurses for disaster response and their capacity to transition to working in a disaster situation, and that disaster training and education improve nurses' knowledge, readiness, and skills (Özden, 2026).

The current study demonstrated the significance of the nursing role in disaster management, indicating that patient assessment and care were the most important and commonly adopted roles among nurses. However, the emergency nurse role has taken precedence, followed by the leadership role, which focuses on directing the responding team and managing efforts, key to disaster management success. According to the participants, the fourth most important job in disaster management was nurses' resuscitation, while the least important was the psychological care and support of victims.

In the current survey, almost one-third of the nurses strongly agreed that emergency nurses are crucial players in disaster management, the highest level of belief among participating nurses. Following that was the idea that emergency nurses are confident and knowledgeable in responding to crises, and that their primary duty during disasters is to provide general patient assessment and care. The highest mean scores were observed for 'Key disaster role' (3.75 ± 1.29) and 'Disaster response confidence' (3.60 ± 1.37), indicating that nurses generally perceive themselves as central actors in disaster management and feel reasonably confident in their ability to respond effectively. In contrast, comparatively lower mean scores were found for 'Clinical response' (3.05 ± 1.21), 'Disaster prevention' (3.10 ± 1.29), and 'Psychological care' (3.13 ± 1.32), suggesting areas where nurses may feel less confident or view their role

as less prominent. These findings highlight the need to strengthen nurses' competencies and engagement in preventive activities, hands-on clinical disaster response, and provision of psychological support to disaster victims.

In general, slightly more than half of the participants in the current study agreed or strongly agreed with the 12 statements describing the main roles of emergency nurses in disaster management. At the same time, roughly one-third disagreed or strongly disagreed. Overall, nurses in the eastern region of Saudi Arabia had a good general understanding of emergency nurses' roles in disaster management.

According to Alzahrani and Kyratsis (2017), most emergency nurses in Mecca's public hospitals appeared confident and knowledgeable about their roles in responding effectively to disasters and mass gatherings. They saw their main role as providing general assessment and care, with a timely response, including resuscitation, triage, and initial consultation. They reported high levels of proper communication with others during emergencies.

Another Saudi study found that during Hajj and Umrah seasons, the key aspects required to be implemented with proficiency by emergency nurses during disaster management included risk assessment, public health surveillance, regulations, legislation, and policy; emergency planning and response; environmental health; public health awareness; strengthening communication; and internal organization (Ridda et al., 2021).

4.1 Gaps in Preparedness, Prevention, and Psychological Care

In the present study, participants showed the least agreement on emergency nurses' roles in disaster prevention, clinical response, and psychological treatment, suggesting uncertainty about the scope and priority of these tasks within their practice. This ambiguity may reflect gaps in formal disaster training and limited emphasis on prevention and psychosocial care in existing

curricula and in-service programs, which traditionally prioritize immediate life-saving interventions and logistical coordination. A recent scoping review of 13 studies showed that, despite Saudi Arabia's high disaster risk, nurses' training and preparedness remain suboptimal and uneven, underscoring the need for more robust, standardized disaster education and capacity-building. It concludes that future research should prioritize experimental and interventional studies to test which educational and training strategies most effectively improve nurses' disaster readiness (Alsolmi, 2024).

From a practice perspective, this finding is concerning, as international frameworks for disaster nursing highlight nurses' roles across the full disaster cycle, including risk reduction, evidence-based clinical management, and provision of psychological support to victims and families. Limited clarity or perceived lower priority for these domains among emergency nurses in the Eastern Region of Saudi Arabia may translate into suboptimal implementation of prevention strategies and psychosocial interventions during real events. Therefore, targeted educational initiatives and institutional protocols are needed to explicitly define and reinforce nurses' responsibilities in prevention, clinical response, and mental health support as integral components of disaster readiness.

Compared to studies conducted in Saudi Arabia, fewer emergency nurses saw their role in a mass-gathering disaster as providing surveillance, prevention, leadership, or psychological care, despite all of these roles being labeled in the hospital's emergency plans for disaster response (Almutairi & Alodhialah, 2024; Alzahrani & Kyratsis, 2017). Emergency nurses' roles in disasters include competencies in communication, preparation and planning, incident management, safety and security, and intervention, as identified through a review of 15 articles from 2006 to 2022 (Motsepe & Schmollgruber, 2025). Furthermore, an Iranian study found that overall disaster preparedness

knowledge among hospital and pre-hospital emergency nurses was low, but nurses with higher disaster preparedness knowledge demonstrated better triage decision-making skills (Azizpour et al., 2022).

4.2 Predictors of Disaster Readiness

In the current study, only marital status significantly predicted nurses' perception of disaster management ($B = 0.512, p = 0.008$), with married nurses scoring higher than single nurses (3.50 ± 0.95 vs. 2.88 ± 1.01). This difference may reflect greater life experience, family responsibilities, and perceived obligations to protect and support others, which could heighten married nurses' sense of responsibility and engagement in disaster situations. It is also possible that married nurses, who are often older and more established in their careers, have greater exposure to disaster-related training or real-life events, which may enhance their perceived roles and confidence in disaster management. These hypotheses warrant further investigation in future studies using designs that can more directly explore the social and psychological mechanisms underlying this association.

That was supported by a previous study that found that marital status significantly predicted nurses' perceptions of disaster management, with married nurses scoring significantly higher than single nurses among 211 nurses (Erkin et al., 2023). On the contrary, a study found no statistically significant differences in nurses' attitudes and familiarity with disaster preparedness by marital status, contradicting the claim that marital status significantly predicts nurses' perceptions of disaster management. The study involved 88 nurses and used a quasi-experimental design with pre-and post-tests (AlOtaibi et al., 2024). Disaster preparedness knowledge was significantly predicted by triage decision-making ability, age, place of residence, previous disaster preparedness training, having worked during a disaster, and the type of organization providing training. These results

indicate that both individual characteristics and training-related factors influence nurses' disaster preparedness, and the authors recommend that educational and healthcare managers tailor disaster training programs to nurses' demographic and experiential profiles to enhance their preparedness (Azizpour et al., 2022).

5. Conclusions

The study concluded that the emergency nurses' usual and most frequently adopted roles during disaster management at eastern region hospitals were general patient assessment and care, followed by triage, leadership roles, resuscitation, and, finally, psychological care and support for disaster victims.

Measuring emergency nurses' knowledge of their roles in disaster management is regarded as one of the most significant concepts and standards for effective disaster management, as nursing is the largest and most extensive health sector. They stand on the front lines to deal with emergencies and disasters. Overall, nurses had sufficient awareness of emergency nurses' functions and roles in disaster management and a positive perception of their essential roles.

6. Implications for practice

The limited agreement on emergency nurses' roles in disaster prevention, clinical response, and psychological care may hinder timely, coordinated, and holistic care during actual disasters, particularly in providing psychosocial support to patients and families.

In clinical practice, institutions should explicitly delineate nurses' roles across all phases of disaster management and integrate these expectations into local protocols, disaster plans, and regular drills. Simulation-based training and interprofessional exercises should specifically emphasize prevention activities, evidence-based clinical management, and psychological support as core nursing functions—not optional tasks.

For education, the results highlight the need to strengthen and standardize disaster nursing content in undergraduate curricula and continuing professional development programs. Structured, competency-based education on disaster preparedness, including psychosocial care, would help align nurses' perceived roles with international best practices.

At the policy level, the findings support the development of national or regional standards for disaster nursing competencies tailored to the Saudi context, including those related to mass gatherings. Such standards

can guide curriculum design, institutional training priorities, and accreditation requirements, ensuring that disaster readiness becomes an integral and measurable component of emergency nursing practice.

7. Recommendations

The study recommends replicating this research using a mixed-methods design and more in-depth longitudinal data collection, with a larger sample of emergency nurses from both public and private hospitals across different regions of Saudi Arabia, to enhance the generalizability of the results. The findings can inform the development of targeted educational and training programs that emphasize nurses' specific roles in disaster response. It is further recommended that standardized disaster nursing curricula be developed and integrated across nursing schools in Saudi Arabia to ensure consistent knowledge and competencies among future nurses. In addition, healthcare institutions should implement regular disaster drills and workshops to strengthen nurses' practical competencies and readiness for real disaster situations. Overall, strengthening emergency nursing training and familiarizing nurses with disaster management plans are essential to improving preparedness, optimizing resource utilization, and minimizing the adverse impacts of future disasters.

8. Limitations

This study has several limitations. The use of self-report, Likert-type questionnaire (12 items) may have introduced respondent bias, and the cross-sectional design limits the ability to infer causality. Additionally, the use of a non-probability convenience sample and a relatively small number of participants from a single region in Saudi Arabia restricts the generalizability of the findings. Future research incorporating observational checklists, either alone or alongside questionnaires, is recommended to obtain more objective and reliable assessments of nurses' disaster management competencies and performance.

9. Declarations:

Data Availability Statement: The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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