

## Assessing disaster preparedness of emergency nurses in Saudi Arabia: A study on educational needs

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### ABSTRACT

This study aimed to evaluate how well emergency nurses (ENs) at a leading hospital in Saudi Arabia are prepared for disasters by conducting an assessment of their educational needs. The research explains the importance of this assessment for the nurses, discusses the expected outcomes based on existing literature, and describes the process of collecting data from 29 ENs using a specific questionnaire. The study used statistical methods to analyze the data and found significant gaps in the nurses' knowledge and training for disaster preparedness. The results of the assessment can help educators understand the learning needs of the nurses and suggest ways to improve their training. The study proposes a 30-hour training course based on the assessment findings and recommends revising the current methods of instruction for nurses to better prepare them for disasters.

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### 1. Introduction

Communities all over the world are vulnerable to the effects of natural disasters (Labrague et al., 2018; Ma et al., 2023), and Saudi Arabia is no exception to this rule. According to the Centre for Research on the Epidemiology of Disasters, 56 disasters have happened in Saudi Arabia since 1980. These disasters have killed about 4,700 people, seriously hurt 34,000 others, and caused USD 1.87 billion in damage. As a result of these disasters, Saudi hospitals have faced difficulties related to management and skill sets. The reaction of healthcare professionals, particularly nurses, is crucial in mitigating the detrimental impact of disasters on victims' healthcare outcomes, particularly given the frequency of catastrophes (Labrague et al., 2018; Ghosh et al., 2022; Aldulijand et al., 2023; Alruwaili et al., 2023).

Hospital ENs are on the front lines of dealing with such problems. Nurses are entrusted with the responsibility of delivering secure and proficient healthcare to the general public in the event of a catastrophe. Consequently, in order to optimize hospital resources, each nurse must possess a

minimum level of proficiency in handling such circumstances. Although disaster preparation is a fundamental component of nursing education, with a specific focus on fundamental principles and the care of victims (Labrague et al., 2018; Mayumi et al., 2009), nurses have little exposure to and knowledge of emergency responses.

Communities globally are increasingly susceptible to the impacts of natural disasters, and Saudi Arabia is no exception. Since 1980, 56 disasters have occurred in Saudi Arabia, resulting in approximately 4,700 fatalities, 34,000 injuries, and damages amounting to USD 1.87 billion. These events have highlighted the significant challenges faced by Saudi hospitals in disaster management and underscore the necessity for healthcare professionals, particularly nurses, to be well-prepared to mitigate adverse effects on healthcare outcomes (Khatri et al., 2023).

Emergency nurses (ENs) play a pivotal role in disaster response due to their frontline position in healthcare delivery during catastrophes. Despite the fundamental inclusion of disaster preparation in nursing education, there is a significant gap in the practical knowledge and exposure of nurses to emergency response scenarios. Studies have shown that many nurses lack the required proficiency and confidence in handling emergency situations effectively (Khatri et al., 2023).

The assessment of educational needs among ENs is crucial for improving their disaster preparedness. Current nursing curricula often do not adequately

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cover emergency preparedness, leading to a disparity between the theoretical knowledge and practical skills required during disasters. For instance, only a small percentage of nurses report feeling confident in their abilities to manage bioterrorism incidents or other large-scale emergencies (Hasan et al., 2021).

Recent evaluations reveal that even experienced nurses exhibit significant deficiencies in disaster management competencies, including gaps in areas such as the incident command system (ICS), ethical triage, epidemiology and surveillance, decontamination procedures, communication during emergencies, and psychological care for disaster victims (Farokhzadian et al., 2024). Addressing these gaps through targeted educational interventions is essential for enhancing the overall preparedness and response capabilities of ENs in Saudi Arabia.

To address these deficiencies, this study proposes a comprehensive training program tailored to the specific needs of Saudi ENs. The program includes critical components such as hands-on drills and simulations, which have been shown to significantly improve disaster response skills. The proposed curriculum aims to bridge the gap between current competencies and the practical demands of disaster management. By enhancing the disaster preparedness of ENs, we can ensure a more robust and effective healthcare response during crises, ultimately improving patient outcomes and resilience within the healthcare system.

## 2. Literature review

Recent studies on nursing education have placed a strong emphasis on being prepared for disasters (AlHarbi and HALqahtani, 2023; Chapman and Arbon, 2008; Fox and Timm, 2008). The Swedish nurses surveyed by Nilsson et al. (2016) said they were only somewhat ready for any kind of emergency. In addition, a study conducted in rural Texas revealed that only 10% of nurses demonstrated confidence in evaluating and diagnosing patients who had been exposed to bioterrorism chemicals (Jacobson et al., 2010). According to a study conducted by Al Khalailah et al. (2012), 65% of nurses in Jordan reported being inadequately prepared for a crisis. A similar finding was made by Öztekin et al. (2014) in Japan, where they discovered that the nursing staff had a low mean level of readiness for disasters. Another study found that there was a significant knowledge gap between nursing school grads and their actual needs in terms of emergency preparedness (Matlock, 2017). A study conducted by Ibrahim (2014) in Saudi Arabia discovered that nurses were only minimally equipped to deal with any kind of emergency. Recent studies have found that nurses, even after extensive training and practical experience, continue to report significant deficiencies in emergency preparedness and competency. They also have a limited understanding of disaster management planning and the application of disaster guidelines (Al Khalailah et al., 2012; Nash,

2015; Whetzel et al., 2013). Alhajjaj and Aldamigh (2017) conducted a study to evaluate the capability of academic emergency departments (EDs) in central Saudi Arabia to treat pediatric patients according to international standards. This study included visits, inspections, and interviews in four academic departments. The findings revealed significant gaps: essential components for pediatric emergency treatment were noticeably lacking in the 193 criteria examined. Only two centers had a specialized pediatric resuscitation bed, none had a dedicated pediatric crash cart, and basic equipment such as weighing scales and hypothermia monitors were missing. The average score across all centers was 53%, with notable deficiencies in equipment and drug availability (49.6%). Furthermore, none of the centers had developed policies for family-centered care or specialized procedures for managing pediatric emergencies. This underscores the critical need for substantial improvements in infrastructure, policies, equipment, and preparedness to adequately handle pediatric emergencies in these academic EDs.

A study by Alshehri (2016) aimed to assess the preparedness of ENs in Saudi Arabia for disasters, given the country's history of natural and man-made catastrophes. Data were collected from 72 participants at two government hospitals in Riyadh, with a response rate of 31.7%. Surveys showed that only 60% of nurses felt confident in their roles after completing training within the last year, despite most understanding their duties after reviewing the disaster plan. Confidence was higher among those who had participated in mass casualty or disaster training programs compared to those who had not. Surprisingly, only 26% of respondents felt confident after experiencing a real disaster, with no significant difference between those who had and those who had not experienced such events. The study concludes that nurses have limited disaster experience, reflected in their low confidence levels after real disaster involvement. This highlights the need for enhanced disaster training to ensure nurses are well-prepared. The findings underscore the importance of improving education and training programs for ENs in Saudi Arabia to better prepare them for various disaster scenarios.

The absence of disaster-related core competencies in nurse training curricula is a contributing factor to the perceived lack of readiness among nurses (Coyle et al., 2007). Numerous scholars have since underscored the necessity for nursing curriculum developers to incorporate disaster education components into their curricula at both the graduate and undergraduate levels (Alfred et al., 2015). Updated emergency preparation knowledge and abilities must be acquired through education for nurses to maintain competency in this area (Dyson et al., 2009). After receiving emergency training, undergraduate nursing students reported high levels of confidence and skill management in the face of disasters, according to a study on emergency preparedness (Alim et al., 2015). Hence, in order to evaluate the present state of emergency

preparedness among nurses in Saudi Arabia and formulate a suitable curriculum to bridge this deficiency in competencies, it is critical to undertake an emergency needs assessment (ENA) (Matlock, 2017).

### 2.1. Target audience: ENs in Saudi Arabia

According to the findings of this study, Saudi ENs require fundamental skills in the area of disaster preparedness. Considering that the demand for nursing staff is significantly higher during times of crisis, the audience that this study intends to target consists of ENs who are in the second grade (Lavin, 2006). The justification for focusing on registered nurses is their ability to facilitate coordination among hospital staff, victims, and families in the event of a disaster, as well as deliver critical long-term relief and emergency medical care. This is particularly crucial given the critical nature of clear communication in disaster planning and response. Through the implementation of clinical procedures and the management of leadership, they play a crucial part in readiness for emergency situations. In addition to this, they place an emphasis on analytical and critical thinking, and they make sure that financial responsibility and accountability are met.

Emergency nursing necessitates the capacity to use information, critical thinking, and decision-making in stressful work environments. Fundamental nursing competencies and skills taught in general nursing curricula are insufficient to prepare ENs for such circumstances. As a result, different nursing schools have come up with their own special courses for EN training. Many healthcare institutions and researchers have underlined the need for training ENs over the years (Fung et al., 2008; Veenema, 2006). Nevertheless, numerous studies have documented that ENs are deficient in fundamental knowledge and abilities to handle emergencies with efficacy (Alfred et al., 2015; Weiner et al., 2005). In several instances, ENs were not even provided with the most basic educational materials or chances for training to advance their skills (Bistaraki et al., 2011; Duong, 2009).

### 2.2. Anticipated outcomes

Efforts have been made to create disaster preparation and planning programs with the aim of mitigating the adverse effects of catastrophes (Barnes et al., 2008). Nurses subject themselves to danger in any calamity (Baack, 2011). Due to a lack of available literature on nursing models for disaster response and preparedness (Baack, 2011), the main goal of this ENA was to provide evidence regarding the necessary education and training to enhance the abilities of Saudi nurses in disaster management (Rebmann et al., 2008).

Garbutt et al. (2008) found that most nurses feel ill-equipped to handle disasters due to the insufficient coverage of emergency preparedness, mass casualties, and mass evacuations in the nursing

curriculum (Buyum et al., 2009). The primary objective of the present research was to provide up-to-date information on areas where the nursing curriculum might be enhanced. As to the findings of Hammad et al. (2011), most nurses have little knowledge and comprehension of their duties in disaster response. They lack practical experience in disaster planning and have a limited grasp of catastrophic events. Although several nurses have undergone disaster education and training, there were significant concerns over the appropriateness, relevance, and availability of these courses. Nurses with advanced training and extensive experience in post-disaster treatment were anticipated to possess elevated levels of expertise. Nurses might get advantages from a comprehensive, research-supported program for disaster education and training facilitated by this ENA.

### 3. Research methodology

The study's assessment instrument aimed to evaluate the level of preparedness among nurses in handling crises. The EPIQ, a commonly used tool for assessing nurses' understanding and proficiency in emergency/disaster preparation, underwent revisions specifically for this objective (Garbutt et al., 2008). The survey had three components: The study aims to gather the professional and demographic data of the nurses, measure their level of expertise in emergency preparation, and evaluate their job satisfaction by inquiring about their workplace (Wieck et al., 2009).

The first segment of the questionnaire inquires about the responsibilities, areas of expertise, professional background, age, and ethnicity of the nurses. Additionally, it includes two inquiries on their previous involvement in disaster or emergency situations. The EPIQ consists of nine subscales, which were included in the study without any changes since they aligned with the needs of the research, as explained in the following section on the execution of the instrument. The evaluation comprehensively assesses a nurse's understanding of disaster and emergency preparation using a 5-point Likert scale. The elements of this scale include factors such as the ICS, ethical concerns in triage, epidemiology and surveillance, decontamination, communication and connection, psychological issues, particular populations, and the capacity to access essential resources. Previous studies using the instrument have shown that it is reliable for the different parts, with Cronbach's alpha values ranging from 0.83 to 0.94 for the subscales and 0.97 for the overall EPIQ score. The internal consistency values for the entire EPIQ score range from 0.84 to 0.95 (Garbutt et al., 2008).

The three questions in the self-regulation section of the questionnaire are about the motivation, dedication, and readiness of nurses to perform efficiently in the event of a community tragedy. For this section, a Cronbach's alpha of 0.91 was recorded. This final portion focuses on the

atmosphere of the workplace and the level of job satisfaction. It inquires as to whether nurses would endorse an individual for employment with their organization and whether they are committed to remaining with their current employer in the long run. Cronbach's alpha was 0.85 for the healthcare climate. The EPIQ was chosen as the sole instrument identified in the literature that assessed the gap between nurses' present understanding of disaster preparedness and their future educational requirements, which was the primary aim of this ENA (McKibbin et al., 2011). Given that nurses are the most sought-after healthcare professionals during a disaster (Lavin, 2006), they must possess a more comprehensive understanding and practical experience in areas such as mass immunization, mass evacuation, treatment of mass casualties, infection control, and prevention of additional damage (Gebbie and Qureshi, 2002). As a result, the EPIQ evaluates the readiness of nurses to manage significant catastrophes in order to fortify regional healthcare systems through the promotion of more efficient emergency response policies and training.

The Emergency Preparedness Information Questionnaire (EPIQ) was chosen because of its demonstrated usefulness in measuring nurses' preparation for crises, which perfectly aligned with the research's main aim of evaluating the preparedness of ENs in Saudi Arabia. The EPIQ, developed by Garbutt et al. (2008), was chosen for this Education Needs Assessment (ENA) due to its reliability, as evidenced by strong Cronbach's alpha values, and thorough assessment across critical dimensions of disaster preparedness, such as ICSs, ethical triage considerations, communication, and resource access.

### 3.1. Ethical considerations: Tool selection

According to Gostin (2004) and Thompson et al. (2006), it is essential to take into consideration the ethical framework while working with nurses as a target population. At the same time, ethical research is essential for the development of nursing as a professional discipline. It is also essential to ensure that nurses provide services of the best possible quality during times of disaster. Consequently, in order to guarantee the study's legitimacy and validity, various ethical concepts served as the guiding principles for this research. The aforementioned principles encompassed regard for individuals' autonomy and persons, beneficence and nonmaleficence, justice and fairness, honesty and confidentiality (Beauchamp and Childress, 2001; Storch et al., 2004).

Individuals who opted to partake in the research were required to provide informed assent by signing a consent form. The researcher provided nurses with comprehensive details regarding the study's characteristics, enabling them to make a well-informed decision prior to their involvement. The data gathered will assist educators in developing more real, engaging, and targeted curricula to

prepare nurses to serve during disasters. Before, during, and after data collection, each respondent was handled fairly and equitably. The nurses' privacy and confidentiality were always observed, and no names or other information that could be used to find them were ever gathered.

### 3.2. Implementation of the assessment tool

The tool was assessed for relevance and validity, and it was determined to be appropriate for use in this ENA in the Saudi setting. After requesting permission, Prof. Peltier, the tool's designer, agreed. With the author's permission, the researcher requested nursing staff from different Saudi EDs. The objectives of this ENA were thoroughly reviewed with the managers of the education/training and quality management departments. This discussion determined the most efficient methods of contacting and surveying nurses. The respondents were selected using purposive sampling, and in total, 29 individuals participated in the questionnaire.

### 3.3. Data analysis

Researchers performed both descriptive and inferential statistical analyses on the data from the Emergency Preparedness Information Questionnaire (EPIQ). A comprehensive overview of the nurses' professional and demographic traits, as well as their levels of knowledge and work satisfaction, were provided using descriptive statistics. The study used inferential statistics, such as regression analysis and correlation, to evaluate the predictive power of specific components on the total disaster preparation ratings and to uncover possible relationships between various variables.

These statistical techniques were used to characterize ENs' preparation for catastrophe situations as well as to pinpoint important aspects and determinants that affect it. The study used a rigorous statistical methodology to give a detailed understanding of the relationships between different variables. This understanding will help educators and policymakers develop more focused training programs and policies that will improve the preparedness of ENs in Saudi Arabia.

## 4. Results

The results are shown in this section after the analysis to detect trends that could guide the creation of educational programs. A summary of the demographic data is provided in Table 1. According to Table 1, the majority of nurses were between the ages of 20 and 29 (M=24), with 5 to 10 years of experience (M=7.17). They pointed out a variety of specialist practice areas, but emergency services were the most common (15), followed by a medical-surgical unit (5). Despite having at least ten years of experience in emergency services, the majority had never worked in a recovery facility or shelter.



**Table 1:** Demographic variables

Characteristic	Frequency	Percent
<b>Age: Mean 24</b>		
20-29	14	48.27
30-39	13	44.82
40 and above	2	6.89
<b>Experience: Mean 4</b>		
Less than 5 years	7	24.13
5-10 years	15	51.72
10 years and above	7	24.13
<b>Professional role</b>		
Staff nurse 1	17	58.62
Staff nurse 2	9	31.03
Advance practice RN	3	10.34
<b>Specialty practice areas</b>		
Medical-surgical	5	17.24
OB-Gyn	3	10.34
Critical care	3	10.34
Pediatrics/neonatal	2	6.89
Operating room/PACU	1	3.44
Emergency services	15	51.72
<b>Active participation in major disaster</b>		
Yes	11	37.93
No	18	62.06
<b>Work experience in post-disaster shelter</b>		
Yes	9	31.03
No	20	68.96

The average reported experience is 4 years, with nurses categorized by their years of experience. About 24.13% of the nurses have less than 5 years of experience, 51.72% have 5-10 years of experience, and 24.13% have 10 years or more of experience. This distribution provides a clear understanding of the varying levels of professional expertise among the emergency nursing staff.

The professional positions are mostly composed of individuals who identify as Staff Nurse 1 (58.62%), followed by Staff Nurse 2 (31.03%), and a lesser proportion as Advance Practice RN (10.34%). This analysis illuminates the hierarchical organization within the nursing personnel, where various positions signify distinct duties and varying degrees of proficiency.

Table 1 also provides detailed information on the nurses' areas of specialist practice. The specialization of Emergency Services is the most prevalent, accounting for 51.72% of the participants. Additional areas of specialization are Medical-Surgical (17.24%), OB-Gyn (10.34%), Critical Care (10.34%), Pediatrics/Neonatal (6.89%), and Operating Room/PACU (3.44%). The presence of several specialist practice areas highlights the need for diverse skill sets and knowledge in the field of emergency nursing.

In addition, Table 1 shows the extent of nurses' engagement in significant calamities, with 37.93% reporting their involvement and 62.06% expressing their lack of active participation. Understanding the practical experience and exposure of nurses to real-life crisis events is essential, and this differentiation plays a critical role in that understanding. Finally, the study investigates the nurses' professional background in post-disaster shelters, revealing that 31.03% of them have reported having experience in this field, while 68.96% have indicated that they have not worked in post-disaster shelters. This feature offers further background on the participation of nurses in post-disaster aid endeavors.

According to Table 2, in general, ENs reported a mean of 2.40 for their knowledge of emergency preparations, and they expressed a low level of self-reported familiarity with disaster and emergency preparation. Their level of familiarity with epidemiology and surveillance was the highest (M=2.33), while their level of familiarity with a specific population was the lowest (M=2.54). They reported having a moderate level of catastrophe preparedness knowledge.

**Table 2:** Descriptive statistics for EPIQ preparedness competencies

No	Competency	N	Min	Max	M	SD
1	Emergency terms	29	1.00	3.71	2.3946	.67938
2	ICS	29	1.25	3.63	2.4688	.55133
3	Ethical triage	29	1.50	3.75	2.4375	.60715
4	Epidemiology surveillance	29	1.00	4.00	2.3750	.82355
5	Decontamination	29	1.33	4.33	2.4405	.75932
6	Communication	29	1.00	4.00	2.4133	.72358
7	Psychological issues	29	1.00	4.00	2.4732	.67474
8	Special populations	29	1.00	4.00	2.4821	.83313
9	Assessing critical cases	29	1.00	4.00	2.6071	.81171
10	Assessment readiness	29	1.00	4.50	2.5000	.97183
11	Self-regulation	29	1.00	5.00	2.8333	1.14934
12	Healthcare climate	29	1.25	3.75	2.6071	.69198
Total	Perceived preparedness	29	1.32	3.80	2.4481	.62265

**Table 3** demonstrates that perceived preparation was marginally linked with self-regulation and the healthcare atmosphere. The self-regulation and perceived preparation correlation coefficient was 0.529. The value of healthcare climate was marginally greater at 0.677%. This showed that self-regulation, a motivating drive, could be a factor in nurses' self-perception of being prepared to face disaster-related issues. In addition, their level of preparation may be influenced by the healthcare

climate, which refers to job satisfaction at work. In addition, there was a significant association (0.741) between the environmental conditions of healthcare and self-regulation. There was a logical connection between contentment in one's work and the drive to succeed. Other links were found between age and experience, experience and healthcare environment, professional role and disaster experience, and post-disaster shelter (but these links don't mean that one caused the other).

**Table 3:** Correlations between dependent and independent variables

Construct	1	2	3	4	5	6	7	8	9	10
Perceived preparedness	1									
Self-regulation	.529**	1								
Healthcare climate	.677**	.741**	1							
Professional role	-.439*	-.291	-.310	1						
Specialty practice area	.140	.197	.048	.124	1					
Experience	-.243	-.165	-.418*	-.025	-.089	1				
Age	.077	-.266	-.263	-.030	-.278	.590**	1			
Ethnicity	-.221	-.081	-.162	.336	.117	-.121	.040	1		
Disaster experience	-.115	.323	.119	-.450*	-.042	.329	-.185	-.102	1	
Post-disaster shelter	.123	.176	.103	-.580**	.129	.104	-.043	-.285	.359	1

\*: Denotes the correlation is significant at the 0.05 level (2-tailed); \*\*: This denotes that the correlation is significant at the 0.01 level (2-tailed)

## 5. Discussion

Nurses rated their emergency preparedness knowledge on a 5-point Likert scale (1 = unfamiliar, 5=extremely knowledgeable). In general, they reported a mean score of 2.40 for their knowledge of emergency readiness, with a low level of self-reported familiarity with disaster and emergency planning. Their level of familiarity with epidemiology and surveillance was the highest (M=2.33), while their level of familiarity with a specific population was the lowest (M=2.54). [Wisniewski et al. \(2004\)](#) used the same instrument and found that nurses had a low level of self-reported familiarity with emergency preparedness. Likewise, the majority of nurses in Taiwan exhibited inadequate capacity to respond effectively to disasters ([Sultan et al., 2018](#)). The study's results identified and ranked the educational and training requirements of nurses employed in Saudi Arabia. These requirements included a stronger focus on subject matter pertaining to protocols for attending to children and adolescents, as well as the provision of suitable care for vulnerable and sensitive patient populations in the context of large-scale emergencies. The nurses (M=2.38) reported being equally comfortable with triaging patients and gaining access to vital resources. This indicated that, as the majority were emergency services personnel, they possessed greater expertise in the psychological and physical evaluation of victims, were more acquainted with triage procedures, and were aware of the most recent resources and the proper reporting agency. Since these areas have been heavily emphasized in the literature for the purpose of developing emergency preparedness programs, their significance is emphasized here. Finding and understanding federal, state, and local regulations and procedures are essential components of this domain, which is why [Kerby et al. \(2005\)](#) emphasized the significance of traits related to

reporting and accessing key information for training. [Gebbie et al. \(2009\)](#) stated that it is imperative for all nurses to be aware of the who, what, and where of reporting for emergency and catastrophe situations.

It is critical that nurses serve children and young people with effective treatment during a large-scale disaster, as well as sensitive and vulnerable patient groups (e.g., older adults, pregnant women, and persons with disabilities) with adequate physical and psychological care. Nurses in Saudi Arabia, on the other hand, expressed the least acquaintance with this topic (M=2.54). This finding suggested that when developing an educational program, a greater emphasis must be placed on material pertaining to the provision of appropriate special care during a large-scale emergency.

The next four aspects were decontamination (M=2.40), ICS (M=2.41), communication and connection (M=2.42), and psychological concerns (M=2.43), with which nurses had a modest level of familiarity. One probable explanation for their lack of experience is that the majority of them had not been involved in catastrophic disasters. Nurses indicated the least amount of familiarity (M=2.55) with the ICS's access and response to site safety issues. They reported limited familiarity with the decontamination procedures outlined in the emergency operations plan for their facility (M=2.44). They expressed the least familiarity with two aspects of communication and connectivity: The first was a chain of custody, where most were unsure of how to report on specific individuals during major disasters (M=2.51), and the second was the efficient dissemination of information regarding the level of risks during disasters.

### 5.1. Implications for future practice

The majority of responders had more than seven years of experience as ENs. A very low average score was obtained across all preparedness competencies.

The mean score for familiarity with emergency terms was the lowest ( $M=2.39$ ), followed by reported communication ability ( $M=2.41$ ) and ethical considerations associated with triage ( $M=2.43$ ). The capacity to assess crucial cases had the highest mean ( $M=2.60$ ). For the purpose of this study, the dependent variable, perceived preparation, was generated by taking the average of all ten preparedness abilities that were included in the EPIQ. Furthermore, the mean score of perceived preparation was extremely low ( $M=2.44$ ) overall. Based on these findings, it was determined that all readiness competency domains need development for the nurses working at the hospital. This improvement can be achieved by education and training.

Tests of correlation revealed a mediocre relationship between perceived readiness and self-regulation/healthcare atmosphere. As a measure of their drive to provide quality treatment, nurses' levels of self-regulation were examined. The moderate positive correlation between motivational drive and perceived preparedness indicated that nurses who possessed this trait were more eager to be ready to confront the difficulties that may arise during a disaster. Nurses' job satisfaction at their location of employment, which was the hospital, was measured by the healthcare atmosphere. The positive moderate connection between job satisfaction and perceived preparation suggests that nurses' perceptions of their own preparedness for disasters are influenced by their level of job happiness. As part of the demographic data, it was anticipated that the nurses' prior experience in addressing critical difficulties would be able to predict their level of perceived preparedness (Al Thobaity et al., 2015). On the other hand, it was discovered that the nurses at the hospital did not have any prior experience in dealing with disasters, which was not a predictor of their assessed level of preparation.

The study's conclusions have important applications for improving ENs' readiness for disasters in Saudi Arabia. The knowledge and ability gaps that have been found highlight how urgently customized educational interventions are needed. The ENA's recommendation to use a 30-hour course template can represent the first step in resolving these shortcomings. The knowledge acquired can be used by health professional educators to review and modify current training programs so that they better meet the unique requirements of ENs in Saudi Arabia. The healthcare system will improve ENs' overall preparedness for disasters by customizing instructional methodologies to overcome the knowledge gap. This will eventually result in more effective emergency response in real-world circumstances. Furthermore, the research offers a framework for creating a thorough, targeted curriculum that complies with Saudi Arabia's unique needs. This makes the study an invaluable tool for decision-makers, instructors, and medical facilities

looking to improve emergency nursing preparedness for disasters.

## 5.2. Predicted outcomes vs. actual outcomes

The actual results closely matched the expected ones. Drawing from the existing body of literature concerning the emergency preparedness of nurses in Saudi Arabia, it is evident that the curriculum lacks a comprehensive framework to enhance nurses' understanding of this subject matter. The nurses in this study exhibited a limited level of self-reported familiarity with disaster and emergency preparedness, as evidenced by their mean score of 2.40 on the familiarity with emergency preparedness scale. Consistent with the anticipated result, this discovery unveiled a dearth of comprehensive frameworks in the field of emergency nursing education pertaining to Saudi nurses. Second, emergency drill-based training leads to better results. For example, Al Thobaity et al. (2015) and Tzeng et al. (2016) showed that nurses learned more about how to handle disasters by taking part in training drills and sims. In this particular study, the nurses' prior experiences dealing with disasters did not serve as a reliable indicator of their perceived level of readiness. The findings of the research conducted in this area, on the other hand, have provided support for the implementation of emergency exercises and the instruction of theoretical concerns of catastrophe preparedness. There is a moderate shortage of understanding on the management of large-scale disasters, as demonstrated by simulations of disasters.

## 5.3. Recommendations

The results of the present study were consistent with other investigations in that they demonstrated that hospital nurses did not believe they were adequately equipped to manage significant emergencies. It was clear from the low mean score ( $M=2.44$ ) for perceived preparation that action needed to be taken to improve things, as outlined below. First, a review of the course material used to instruct nurses is necessary. The target group identified weaknesses in a number of noteworthy competency areas. As a result, it is advised that curriculum development concentrates on these weak areas. The mean level of nurses' knowledge of phrases connected to emergencies, for instance, was found to be poor. Study materials might prevent this shortcoming by including key phrases relevant to emergencies. Second, the results of emergency drill-based training are more desirable. As Al Thobaity et al. (2015) and Tzeng et al. (2016) showed, nurses' first-hand experience with training exercises and simulations enhanced their understanding of disaster management. According to the present research, nurses' prior disaster management expertise should increase their responsiveness and functional activity in the event of an actual catastrophe.

The third result was that while some nurses had received education and training in crisis management, there were significant issues with the suitability, relevance, and accessibility of these programs, according to [Hammad et al. \(2011\)](#). However, the majority of respondents in the present survey identified emergency services as their area of expertise, suggesting that they were knowledgeable about and had experience with disaster preparation. However, given that their overall level of knowledge was not very high, it was reasonable to assume that nurses received some training in this area; however, there was disagreement over the suitability, significance, and accessibility of such training.

## 6. Challenges conducting ENA

Finding a valid, trustworthy tool and agreeing on it was not easy. Due to the fact that the literature was restricted in this area, the instrument required careful examination. Permission and access to the Saudi Arabian target group from Australia was difficult and time-consuming. Additionally, there were some drawbacks to the questionnaire, such as the possibility of response-recall bias, questions that were not clear, issues with the layout of the questions, and answers that were either incorrect or incomplete. Due to the fact that this study was primarily concerned with ENs, additional responsibilities were neglected; however, these could be addressed in subsequent research. The focus of this study was on the duties and skills of nurses during a large-scale disaster; however, the study did not identify the responsibilities that nurses play in the post-disaster response and recovery process.

## 7. Conclusions

The regularity and intensity of disasters necessitate that healthcare facilities train their employees to handle large-scale crises and catastrophes. Unfortunately, research has shown that ENs are less prepared to deal with the special issues that disasters present. An attempt was made

in the current ENA to gain an understanding of the shortcomings that exist in the competencies of ENs in a variety of competency domains related to disaster preparedness. For the purpose of data collection, the EPIQ was utilized due to its high validity and reliability ([Baack, 2011](#)). The data were statistically analyzed, and the results showed that nurses working at a major teaching hospital in Saudi Arabia lacked preparedness for disasters in all of the skill domains that were found. According to the findings of the study, the dependent variable was perceived preparation, which was determined by the overall mean score of these abilities. Considering the poor level of preparedness for disasters that were discovered, it is necessary to review the teaching materials and procedures that are already in place in order to better equip nurses with professional expertise in the management of crisis situations. It is, therefore, possible that the findings would give empirical foundations for the development of emergency preparation education and training programs for engineers in Saudi Arabia. Suggested syllables (32 credit hours) are shown in [Table 4](#).

### 7.1. Limitations and future research

Although this research offers useful data on Saudi Arabian ENs' readiness for disasters, several limitations should be noted. The study's limited emphasis on a single teaching hospital and small sample size of 29 ENs have limited the applicability of the results to a larger population of ENs working in various healthcare environments. Future studies will broaden the focus by including more participants and a variety of healthcare facilities. Furthermore, response bias is a concern due to the dependence on self-reported data. Future research employs observational evaluations or objective measurements to lessen this. To direct future training programs and policy creation, it would be essential to investigate the long-term efficacy of the suggested 30-hour course design and evaluate the durability of increased disaster preparation abilities among ENs.

**Table 4:** Proposed topics for the program: Suggested syllabus (32 credit hours)

No.	Lecture topic	Lecture/practicum	Time spent on learning
1	Introduction to emergency terms	Lecture	5 hours
2	Introduction to ICS	Lecture and practicum	4 hours
3	Exploring ethical issues in triage	Lecture	3 hours
4	What is epidemiology surveillance?	Lecture and practicum	4 hours
5	Decontamination causes and symptoms	Lecture and practicum	4 hours
6	Effective communication in emergencies	Lecture and practicum	3 hours
7	What are the psychological issues of trauma?	Lecture	3 hours
8	Identification of a special population	Lecture and practicum	3 hours
9	Identification of critical situations	Lecture	3 hours

## Compliance with ethical standards

### Ethical considerations

This study was conducted following ethical principles essential for nursing research, ensuring the quality of services provided by nurses during

disasters. Ethical principles such as respect for individuals' autonomy, beneficence, nonmaleficence, justice, fairness, honesty, and confidentiality guided the research. Participants provided informed consent by signing a consent form after being thoroughly informed about the study's nature and purpose. Privacy and confidentiality were



maintained throughout the study, with no personal identifiers collected. The study protocol was approved by the Institutional Review Board (IRB) of Monash University and King Saud University, ensuring compliance with ethical standards.

### Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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