

Nurse`s Preparedness in Disaster Response: A Cross-Sectional Study

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Abstract

Nurses play a pivotal role in disaster management. Therefore, it is essential that nurses maintain a high level of preparedness and possess the necessary skills to participate effectively in all phases of disaster management. Aim: This study was aimed to assess the levels of preparedness among nurses in disaster response. Methods: A descriptive cross-sectional study was conducted on 335 nurses working in three government hospitals and six primary health care centers in Al-Najaf city by using Convenience sampling. Furthermore, the data were collected using a self- report questionnaire included socio-demographic characteristic of participants and the Disaster Preparedness Evaluation Tool (DPET). the study continued from 14 October 2025 to 10 April 2026. Result: The current study results indicate the overall assessment of the nurses' level of preparedness about disaster response was moderate (57.01%). With respect to the relationship of participants' socio-demographic data with their preparedness levels the study revealed the existence of a statistically significant relationship between nurse`s preparedness level with all socio-demographic characteristics except current place of work. Conclusion: that the nurses were moderately prepared for disasters response. Reflecting the need to support this vital staff. Therefore, the study recommends providing disaster education and training as part of continuing education for all health workers, especially nurses and giving priority to promote a culture that reinforces the crucial role of nurses in disaster preparedness, response, and recovery.

Keywords: Disaster preparedness, Knowledge, Skills, Disaster management, Disasters, Nurses.

1. Introduction

Disasters occur in various parts of the world and not confined to a specific region. Disasters occur quickly and without prior warning resulting in economic, social, healthcare damage. Disasters are defined as sudden, catastrophic event that seriously disrupts the functioning of a community or society and causes human, material, economic or environmental losses that exceed the community's or society's ability to cope using its own resources [1]. Disasters can be categorized as either natural or man-made, based on the underlying causation. Natural disasters are those beyond the control of mankind. They comprise earthquakes, tornadoes, droughts, and volcanic eruptions. Man-made disasters comprise occurrences caused by the activities of mankind. They include wars, armed conflicts, structural failures, biological disasters, mass gatherings, and traffic accidents [2].

Globally, statistics indicate that in 2017, a total of 335 natural disasters occurred, affecting more than 95.6 million individuals. The disasters resulted in 9,697 deaths and incurred a cost of 340 billion United States dollars. Of all the disasters, 136 occurred in Asia, 93 in the United States, 42 in Africa, 39 in Europe, and 8 in Oceania. The distribution of disaster burden was not equitable, as Asia bore 44% of all disasters, 58% of all deaths, and 70% of all individuals affected [3]. In order to reduce the possible adverse consequences of a disaster, the implementation of a strategy for managing the disaster is necessary. There are four major steps in the management of a disaster. The four steps include mitigation, preparedness, response, and recovery. It is common for the mitigation and preparedness steps to take place before the occurrence of the disaster. The response step is carried out during the occurrence of the disaster, while the recovery step is carried out after the occurrence of the disaster [4].

The occurrence of disasters creates unique situations that require health care professionals to adapt to changing environments. Nurses, being the biggest population of health care professionals, play a critical role in managing disasters. Considering the aspect of disaster management, nurses are the first health care professionals to encounter the patient during a disaster occurrence. In the history of disasters, regardless of the type of disaster, nurses have been actively involved in all phases of disasters management [5]. Disaster nursing is defined by the Journal of the Japan Society of Disaster Nursing (JSDN) as the methodical and adaptable application of disaster-related knowledge and skills, as well as collaboration with other professional fields, from pre-disaster to post-disaster to reduce health risks and life-

threatening damage caused by disasters and assist activities to improve life ability [6].

Disaster preparedness consists of a set of measures undertaken in advance by governments, organizations, communities, or individuals to respond better and cope with the immediate aftermath of a disaster, whether it is human-induced or caused by natural hazards. The objective of this preparation is to reduce the loss of life and livelihoods [7]. Nurse's Preparedness in disaster response includes the possession of knowledge, skills, and abilities needed to be prepared for and respond to severe situations, which may be man-made or naturally caused. Nursing preparedness in disaster response refers to a process in which nurses get engaged in order to be adequately prepared for disaster response [8].

Nurses' knowledge of disaster management includes their understanding of emergency preparedness procedures and their awareness of best practices and protocols [9]. In addition, Nurse's knowledge in disaster management is an indispensable part, this part has a lot of benefits not only for nurses but also for health care organization in disaster-prone areas. Therefore, when the nurse was highly qualified and possesses the required knowledge about disaster management, they will be good health educator for public about how to cope with disaster. This knowledge possess by nurses about disaster may be adequate or inadequate, that based on allot of factors as level of education, previous experience, age and self-development. A nurse's familiarity with catastrophes is crucial to the readiness and response stages of the disaster management process [10].

In times of disasters, having nursing skills is essential. The skills include recognizing hierarchies, being aware of emergency response plans, conducting frequent practice exercises, using emergency equipment such as personnel protection equipment properly, adhering to communication channels and routes, taking part in exercise evaluation, and modifying the response plan as necessary. Technical efficiency, the capacity to use nursing techniques with specialized equipment, the ability to conduct physical examinations, clinical decision-making skills, trauma and triage skills, flexibility, and the capacity to carry out tasks in non-conventional roles are all examples of nurses' clinical skills in disaster situations [11]. Being prepared for disasters is a crucial professional skill for nurses since prepared nurses can help victims of disasters. Additionally, nurses are capable of delivering full relief management services that involve interdisciplinary professional teams and cross-sector coordination. These services include mapping the catastrophe location, offering disaster mitigation, triaging patients, and coordinating first aid. Isolation, quarantine, and decontamination; psychological concerns; epidemiology and clinical decision-making; communication and connectivity; triage and basic first aid; detection; access to vital resources and reporting; and the incident command system (ICS) are the eight dimensions that can be used to gauge nurse preparedness [12].

Iraq, like many other countries, is threatened by natural and man-made disaster. Man-made disasters have become prevalent in Iraq in recent years especially after the decade of 1980s. No doubt, human-made disasters have affected many people in the last few years. Moreover, from statistical data, it has been observed that 40,000 people got injured or died throughout 2014, 2015 and the first half of 2016 because of the occurrence of war. Though the intervention in any stage of the disaster management process can increase preparedness, develop warning systems, lower vulnerability, or even prevent disasters, yet the history in Iraq reveals that there has not been any planned response to disasters. Thus, giving a good disaster response poses a difficult task for nurses and therefore requires proper assessment of their knowledge, skills, and competency levels [13].

2. Methodology

2.1 Study Design and Settings

A descriptive cross-sectional design was used in the study. The study was conducted as multicenter study including three public hospitals and six primary healthcare centers in AL-Najaf city. The study was carried out during the period from 14 October 2025 to 10 April 2026.

2.2 Study Sampling

Convenience sampling was used in the study. The participants were selected based on their availability and voluntariness to participate at the time of data collection. The sample size was calculated to be 335 nurses using Krejcie & Morgan Formula.

2.3 Ethical Consideration

The researcher obtained ethical approval for this study from Medical Research Ethics Committee (MREC) of Faculty of Nursing in University of Kufa. Another approval was obtained from the Ministry of health. In addition, Informed consent was obtained from all participants prior to their participation in the study.

2.4 Data Collection Instruments

The data for the current study were collected using a self-report questionnaire which included two parts.

Part I: Socio-Demographic Characteristics

The first part of the questionnaire was socio-demographic data which consists of 8 items including (Age, Sex, Level of education, Years of clinical experience, Current place of work, Department, do you have previous experience in disaster management, have you attended a disaster risk management training course).

Part II: Disaster Preparedness Evaluation Tool

The second part of the questionnaire included Disaster Preparedness Evaluation Tool (DPET) which was adopted from previous studies [14, 15]. The instrument consists of 45 Likert type questions with three domains (knowledge (13 item), skills (11 item), and personal preparedness (21 item)). The range of the response scale was from 1 to 6 (strongly disagree to strongly agree). Internal consistency reliability for the original instrument using Cronbach's alpha was 0.91 while in the current study was (0.97).

2.5 Data Analysis

All the data in the current study were entered and analyzed using the statistical package for the Social Sciences (SPSS version 26). Descriptive statistics, such as means, standard deviation, Percentages, and frequencies were used to clarify the demographic characteristics of the participants. Inferential statistics were employed to examine relationship among variables such as One-way ANOVA and independent t-test.

3. Result

Table (1) summarized the frequency distribution of socio-demographic data. This table shows that the majority of the studied nurses were relatively young (57.91%) aged 26–35 years with a mean 30 ± 7.39 years, see figure (4.1). Females constituted a higher percentage of the sample (60.60%) than males (39.40%). Regarding educational level, 45.37% of the nurses held a bachelor's degree, followed closely by those with a nursing diploma (41.79%), while only 1.19% of them had postgraduate qualifications. In terms of professional experience, 57.61% of the participants had five years or less of clinical experience, with a mean 7 ± 7.03 years. Most participants were employed in hospitals (89.55%), with the emergency department representing the largest departmental placement (35.22%), highlighting a high exposure to acute and critical care settings. However, despite this clinical environment, 62.39% of nurses reported no previous experience in disaster management and 64.18% of them had not attended disaster risk management training courses.

Table 1: Statistical Distribution of Socio-Demographic Characteristics for the studied Nurses

Socio-Demographic characteristics	Rating and Intervals	F.	%
Age Groups (Years)	≤ 25	95	28.36
	26 - 35	194	57.91
	36 - 45	28	8.36
	46 and more	18	5.37
	Mean $\pm$ SD (Min-Max)	30 ± 7.39 (21-59)	
Sex	Males	132	39.40
	Females	203	60.60
Level of education	Nursing school	39	11.64
	Diploma of nursing	140	41.79
	Bachelor of nursing	152	45.37

	Postgraduate nursing	4	1.19
Clinical experience (Years)	≤ 5	193	57.61
	> 5	142	42.39
	Mean ± SD (Min-Max)	7 ± 7.03 (1-37)	
Current place of work	Hospital	300	89.55
	Primary health care center	35	10.45
Department	Primary health care units	35	10.45
	Emergency department	118	35.22
	Intensive care unit	33	9.85
	Operating room	20	5.97
	Medical ward	18	5.37
	Surgical ward	42	12.54
	Pediatric ward	17	5.07
	Other department	52	15.52
Do you have previous experience in disaster management?	Yes	126	37.61
	No	209	62.39
Have you attended a disaster risk management training course?	Yes	120	35.82
	No	215	64.18
Total		335	100%

Table (2) showed that the majority of nurses (62.69%) were classified at a moderate level of knowledge regarding disaster management, with an overall mean score of 3.42 ± 0.84 . A smaller percentage (19.70%) of nurses demonstrated a good level of knowledge, while 17.61% were categorized as having poor knowledge.

Table 2: Statistical distribution of the Disaster Preparedness Evaluation Tool Items about overall items of the Nurse's level of knowledge for Disaster Management.

Overall Items		F.	%	Mean ± SD	Assis.
Nurse's level of knowledge for disaster management	Poor	59	17.61	3.42 ± 0.84	Moderate
	Moderate	210	62.69		
	Good	66	19.70		

%= percentage, F. = frequency, Mean and Standard deviation (SD)); Mean ≤ 2.66: Poor, 2.67-4.33: moderate, 4.34 and more: Good, Assess.: Assessment.

Table (3) showed that 49.85% of the nurses were classified as having a moderate level of skill in disaster management, with an overall mean score of 3.27 ± 0.99 . About 31% of nurses fell within the poor skill category, while 19.10% demonstrated a good level of skill.

Table (3): Statistical distribution of the Disaster Preparedness Evaluation Tool Items about overall items of Nurse's

level of Skill for Disaster Management.

Overall Items		F.	%	Mean ± SD	Assis.
Nurse`s level of Skill for Disaster management	Poor	104	31.04	3.27 ±0.99	Moderate
	Moderate	167	49.85		
	Good	64	19.10		

%= percentage, F. = frequency, Mean and Standard deviation (SD)); Mean ≤2.66: Poor, 2.67-4.33: moderate, 4.34 and more: Good, Assess.: Assessment.

Table (4) showed that 52.84% of the nurses were classified as having a moderate level of personal preparedness for disaster management, with an overall mean score of 3.44 ± 0.99 . About 24% demonstrated a good level of preparation, while 22.99% were categorized as having poor preparation.

Table (4): Statistical distribution of the Disaster Preparedness Evaluation Tool Items about Overall Items of Nurse`s level of Personal Preparedness for Disaster Management.

Overall Items		F.	%	Mean ± SD	Assis.
Nurse`s level of personal preparedness for disaster management	Poor	77	22.99	3.44 ±0.99	Moderate
	Moderate	177	52.84		
	Good	81	24.18		

%= percentage, F. = frequency, Mean and Standard deviation (SD)); Mean ≤2.66: Poor, 2.67-4.33: moderate, 4.34 and more: Good, Assess.: Assessment.

Table (5) showed that the majority of nurses (57.01%) were classified at a moderate level of overall disaster preparedness, with an overall mean score of 3.39 ± 0.90 . About one-fifth of the nurses (20.90%) demonstrated a good level of preparedness, while 22.09% were categorized as having poor preparedness.

Table (5): Statistical distribution of the Disaster Preparedness Evaluation Tool Items.

Overall Items		F.	%	Mean ± SD	Assis.
The Disaster Preparedness Evaluation	Poor	74	22.09	3.39 ±0.90	moderate
	Moderate	191	57.01		
	Good	70	20.90		

%= percentage, F. = frequency, Mean and Standard deviation (SD)); Mean ≤2.66: Poor, 2.67-4.33: moderate, 4.34 and more: Good, Assess.: Assessment.

Table (6) showed that nurses' disaster preparedness is significantly influenced by several socio-demographic factors. Age, sex, level of education, clinical experience, department, previous disaster management experience, and attendance of disaster risk management training all had a significant positive association with preparedness scores, with older nurses, males, those with more experience, and those who had prior disaster exposure or training scoring higher. While, no significant difference was found based on the current place of work (hospital vs. primary health care center), p-value was > 0.05.

Table (6): Relationship between Socio-Demographic Characteristics of the studied sample and Disaster Preparedness Evaluation.

Socio-Demographic Characteristics	Rating and Intervals	Mean	SD	Statistical Test	P-Value
Age Groups (Years)	<= 25	2.95	0.60	35.93	<0.0001 (HS)
	26 - 35	3.37	0.88		
	36 - 45	4.36	0.72		
	46 and more	4.48	0.64		
Sex	Males	3.77	0.88	6.59	<0.0001 (HS)
	Females	3.14	0.83		
Level of education	Nursing school	3.99	1.01	7.35	<0.001 (HS)
	Diploma of nursing	3.25	0.93		
	Bachelor of nursing	3.36	0.80		
	Postgraduate nursing	3.36	0.18		
Clinical experience (Years)	<= 5	3.11	0.76	7.19	<0.0001 (HS)
	> 5	3.78	0.93		
Current place of work	Hospital	3.37	0.86	0.993	0.322 (NS)
	Primary health care center	3.53	1.18		
Department	Primary health care unit	3.35	0.79	2.29	0.027 (S)
	Emergency department	3.14	0.82		
	Intensive care unit	3.33	0.97		
	Operating room	4.00	0.89		
	Medical ward	3.57	0.98		
	Surgical ward	3.41	0.89		
	Pediatric ward	3.21	0.81		
	Other department	3.53	1.18		

Do you have previous experience in disaster management?	Yes	4.34	0.58	26.32	<0.0001 (HS)
	No	2.82	0.47		
Have you attended a disaster risk management training course?	Yes	4.30	0.67	21.00	<0.0001 (HS)
	No	2.88	0.55		

4. Discussion

The concept of disaster preparedness is broad and complex. In the current study, it encompassed three distinct dimensions: nurses' knowledge, skills, and personal preparedness. Although the overall level of nurses' disaster management preparedness was moderate across all three dimensions (57.01%), with a mean score of (3.39 ± 0.90), but a closer analysis of specific items within these dimensions reveals several notable findings.

In the knowledge section the highest mean score was (4.99±0.86) in item 2, "I would be interested in educational classes on disaster preparedness that relate specifically to my community situation." This finding indicates that nurses recognize the importance of disaster education. Conversely, the lowest mean score was (2.58±1.46) in item 13, "I have participated in emergency plan drafting and emergency planning for disaster situations in my community." This result may reflect a lack of integration of nurses as active partners in disaster planning and management.

In the skills section the highest mean score was (4.13±1.05) in item 14, "I am aware of what the potential risks in my community" this finding indicates that nurses demonstrate awareness of the risk factors present in their community. In contrast, the lowest mean score was (2.59±1.40) in item 24, "I participate/have participated in creating new guidelines, emergency plans, or lobbying for improvements on the local or national level" this finding show limited involvement of nurses in decision-making processes, in addition to insufficient training in leadership and health policy, and a lack of institutional empowerment.

In the personal preparedness of nurse section, the highest mean score was (3.84±1.13) in item 31, "As a nurse, I would feel confident in my abilities as a direct care provider and first responder in disaster situations " and the lowest mean score was (3.09±1.30) in item 39, "I participate in peer evaluation of skills on disaster preparedness and response " this results revealed ambiguity in the nursing role and a lack of understanding among nurses regarding their responsibilities during the different phases of disasters management.

The findings of the current study aligned with other studies conducted in United States of America, Indonesia, and Palestine [3, 16, 17]. All these studies reported a moderate level of disaster knowledge, skills and preparedness.

According to the current study, findings indicated that nurse's socio-demographic Characteristics age, sex, level of education, years of clinical experience, department, previous disaster management experience, and attendance of disaster risk management training all had a significant positive association with preparedness level ($P < 0.001$, $P = 0.027$, $P < 0.0001$). While, no significant difference was found based on the current place of work ($P = 0.322$). These results indicate that disaster preparedness is influenced by socio-demographic factors, and that experience, education, and training in disaster management may play a pivotal role in enhancing nurses' readiness. Furthermore, the nature of the department and years of experience may contribute to developing skills in handling emergency situations.

The current study results agree with other studies conducted in Indonesia and Iran [18-20]. Results of these studies showed that was significant relationships between socio-demographic Characteristics of the studied nurses with their

preparedness level.

Limitation

The research was restricted to three government hospitals and six primary healthcare centers within a single city (Al-Najaf, Iraq). Because of this localized focus, the findings regarding moderate disaster preparedness (57.01%) may not be fully generalizable to nurses working in private healthcare sectors, rural areas, or other provinces across Iraq

5. Conclusion

The results of the current study indicated that nurses were moderately prepared for disasters response in terms of knowledge, skills, and personal preparedness. Furthermore, the study results revealed the existence of a statistically significant relationship between nurse's preparedness level with all socio-demographic characteristics except current place of work. Based on the study's findings,

Authors Contribution

Za,Sa,Mo: Conceptualization of the study, literature search, data collection, statistical analysis, manuscript writing and editing.

HA,Mo,Ta.: contributed to the conceptualization of the study, assisted in data collection and analysis, participated in drafting and revising the manuscript, provided critical feedback throughout the research process and helped shape the final version of the article

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Conflict of Interest

The author acknowledges no conflict of interest in this study.

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