

*Original Article*

# Disaster management knowledge and practices among nurses: A cross-sectional study

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**Objectives:** Disasters significantly disrupt human life and societal structures worldwide, necessitating robust disaster preparedness systems. Nurses play a crucial role in disaster response; however, ongoing training and specialized skills are essential due to the dynamic nature of these events. This study aims to address the lack of data on nurses' perceptions of disaster education and preparedness. Understanding these perceptions is vital for improving nursing education and enhancing the effectiveness of disaster response.

**Material and Methods:** An observational cross-sectional study was conducted with a sample of 60 nursing staff working in the OPD, emergency, and ICU wards of Guru Teg Bahadur (GTB) Hospital in Delhi. A self-administered questionnaire on knowledge and practices related to disaster management was provided to the participants, and their responses were recorded. The questionnaire consisted of three sections: questions pertaining to participant and baseline information, knowledge, and practices. Additionally, there was a separate section for participants to offer suggestions on how to improve their knowledge and practices.

**Results:** The results indicated a significant level of awareness and knowledge (70.9%) among the participants regarding disaster management. However, notable gaps exist in specific expertise and experience related to disaster preparedness and response. It was observed that only 32 participants (53.3%) regularly or occasionally participated in disaster drills, highlighting a lack of practice among them.

**Conclusion:** The assessment of disaster management practices among hospital staff revealed both strengths and areas for improvement. While there is a general awareness and understanding of disaster management principles, gaps in practical engagement and procedural knowledge remain. There is a strong consensus on the need for more workshops and simulated training. To address these issues, it is essential to implement regular mandatory drills and enhance training programs. These measures will help hospitals cultivate a more resilient workforce capable of effectively responding to disasters and ensuring the safety of patients and the community.

**Keywords:** Disaster preparedness, Knowledge, Nursing staff, Practices

**INTRODUCTION**

Disasters cause significant disruptions, impacting human lives, economic stability, and physical structures globally.<sup>1</sup> They range from natural calamities to human-made crises, affecting individuals, families, groups, and communities.<sup>2</sup> Effective disaster management relies on preparedness, risk assessment, and multidisciplinary approaches to address both short-term and long-term health needs.<sup>3,4</sup> The goal of disaster preparedness is to establish robust systems, procedures, and resources for providing seamless assistance to disaster victims, focusing on immediate response and long-term recovery. Continuous learning, strategy adaptation, and community

engagement are crucial for building resilience. Nurses play a vital role in disaster management and recovery, but they often lack adequate emergency preparedness. Training, education, and specialized skills are essential for enhancing their preparedness.

A study at Guru Teg Bahadur (GTB) Hospital in East Delhi, a 1,600-bed multi-specialty facility, aims to assess nurses' knowledge and practices regarding disaster preparedness. Given the hospital's comprehensive medical services and its exposure to various disasters, effective preparedness is critical. Using a meticulously designed questionnaire, the study seeks to understand the knowledge and preparedness

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levels of nursing professionals, providing insights for future strategic improvements. The primary objective of the study is to document the level of knowledge and practices of nurses regarding disaster management at GTB Hospital. Secondary objectives include assessing the skill levels and determining the training status of nurses in disaster management.

## MATERIAL AND METHODS

An observational cross-sectional study was conducted to address the aims and objectives. We included nursing staff working in the outpatient department, emergency wards, and ICU for at least one year. The study took place at GTB Hospital between April 2024 and August 2024. Participants received a self-administered questionnaire, and their responses were recorded. The questionnaire consisted of three sections: participant and baseline information, questions related to knowledge, and questions related to practices. Additionally, there was a separate section for participants to provide suggestions on how to improve knowledge and practices.

The data was entered into an MS Excel spreadsheet, followed by statistical analysis to address the study's aims and objectives. The data collected using the study tools were converted into a computer-based format and analyzed using SPSS version 20.0 software.

## RESULTS

### General characteristics of the participants

A total of 60 participants were recruited for the present study, with ages ranging from 24 to 55 years and a mean age of 37.7 years. Among the participants, 27 (45%) were male, and 33 (55%) were female. The participants' experience varied from 1 to 29 years, with a mean experience of 11.5 years. Regarding educational qualifications, 31.7% had completed a diploma, 61.7% had earned a bachelor's degree, and 6.7% had completed a master's degree. It was noted that 38.3% of the participants had no training in disaster management, while 56.7% had received training, and 5% were unsure if they had undergone any training.

### Nursing staff's knowledge and practices regarding disaster preparedness

#### Knowledge assessment of participants

The knowledge assessment of participants is detailed in Table 1. It was observed that 25 participants (41.7%) had experience in dealing with disasters, and 96.7% agreed that Delhi is at risk of both natural and man-made disasters. Among the 60 participants, 16 (26.7%) indicated that they were familiar with the major components of the disaster plan, 20 (33.3%) had partial knowledge, and 24 (40%) were unaware of the

**Table 1:** Knowledge assessment of participants

Knowledge assessment	Yes	No
1. Disasters come in many shapes and sizes.	57(95%)	3(5%)
2. Disaster is a mismatch between event-driven needs and the resources that can be met.	54(90%)	6(10%)
3. Disaster management is the sole responsibility of healthcare workers.	22(36.7%)	38(63.3%)
4. The research literature on disaster management is easily accessible.	39(65%)	21(35%)
5. The research literature on disaster management is understandable.	41(68.3%)	19(32.7%)
6. Know where to find relevant research or disaster management information to fill knowledge gaps.	35(58.3%)	25(41.7%)
7. In case of a disaster, there is sufficient support from local officials on the governance level.	40(66.7%)	20(33.3%)
8. Familiar with the principle of triage	54(90%)	6(10%)
9. Does your hospital have an emergency plan?	55(91.7%)	5(8.3%)
10. Are you aware of the hospital's emergency evacuation procedures during disasters?	39(65%)	21(35%)
11. Realistic on-scene training is vital to an efficient and effective disaster management plan.	53(88.3%)	7(11.7%)
12. Disaster management is truly a system-oriented specialty and involves multiple responding agencies.	58(96.7%)	2(3.3%)
13. Do you know where to find the disaster plan?	26(43.3%)	34(56.7%)
14. Do you know what drills are?	56(93.3%)	4(6.7%)
15. Do staff members understand their roles during a drill?	50(83.3%)	10(16.7%)

components. Additionally, it was noted that 35 participants (58.3%) were aware of the potential risks and emergencies in the country.

#### Practices assessment of participants

When asked about their participation in drills and exercises related to disaster management, 6 participants (10%) stated that they participate regularly, 20 (33%) said rarely, 22 (36.7%) indicated occasionally, and 12 (20%) reported that they never participate.

It was noted that 6 participants (10%) felt that the disaster management practices in the hospital were very effective, 28 (46.7%) considered them effective, 20 (33.3%) felt neutral, and 6 (10%) deemed them ineffective. Additionally, 38 participants (63.3%) stated that disaster drills are conducted in the hospital. However, the results also indicated that 42 participants (70%) reported there is no ongoing training available in the hospital. Furthermore, 28 participants (46.7%) indicated that the disaster plan in the hospital is updated frequently, and 27 (45%) reported having personal or family emergency plans for disaster situations. When asked if there is a need for more workshops and simulated training to prepare for disasters, 57 participants (95%) agreed. The skill assessment and training status of the participants is detailed in Table 2.

**Table 2:** Skill assessment and training status of the participants

Skill assessment	Yes	No	Don't know
1. My role in disaster management is clear	35(58.3%)	12(20%)	13(21.7%)
2. Ready to handle whatever potential risks and disaster emergencies exist in the community	40(66.7%)	8(13.3%)	12(20%)
3. Previously attended any workshops/ seminars about disaster management	36(60%)	24(40%)	--
4. If yes, the knowledge gained is enough to practice in real situations	21(35%)	15(25%)	--
5. Nursing education enabled me to be ready to practice in the setting of disaster (natural: e.g.: earthquakes and floods; or human-made: e.g.: embargo or wars)	47(78.3%)	13(21.7%)	--
Training Status	Yes	No	
1. Willing to attend the emergency medicine education incorporated in the continuous professional education programs	56(93.3%)	4(6.7%)	
2. Other extracurricular resources (e.g. internet, TV, radio, and newspapers) enable me with a sufficient degree of readiness to practice under disaster	34(56.7%)	26(43.3%)	
3. Need more training on providing patient-centered care in the situation of disaster	58(96.7%)	2(3.3%)	

### Suggestions for improvement in knowledge and practices

Participants were asked to provide suggestions for enhancing knowledge and practices related to disaster management. A significant portion, 22 individuals (36.6%), recommended organizing seminars on disaster management is essential. Additionally, 32 participants (53.3%) expressed the need for more workshops to strengthen their understanding and preparedness.

When asked about improving practical applications, 36 respondents (60%) emphasized the importance of conducting mock drills and realistic training sessions. Additionally, 29 individuals (48.3%) highlighted the value of establishing a skills lab to facilitate hands-on learning and skill development.

## DISCUSSION

In our study, we enlisted 60 participants employed as nursing staff at GTB Hospital, Delhi. The results indicated a significant level of awareness and knowledge among participants regarding disaster management; however, notable gaps remain in specific expertise and experience related to disaster preparedness and response. The assessment of disaster management practices revealed various strengths and weaknesses in the current system, providing insights into areas that require improvement to enhance preparedness and response capabilities.

### General awareness and perceptions

An overwhelming majority (95%) of participants recognize that disasters come in many forms, indicating a high level of general awareness about their diverse nature. Similarly, 90% understand that a disaster is characterized by a mismatch between event-driven needs and available resources, suggesting a solid conceptual grasp of disaster dynamics. A substantial proportion of participants (96.7%) acknowledged that Delhi is at risk of both natural and man-made disasters. This high level of agreement reflects widespread recognition of the region's vulnerability, which is essential for fostering a culture of preparedness. However, only 41.7% of participants had direct experience in dealing with disasters, highlighting a potential gap between theoretical awareness and practical experience. Consistent with the study by Younis *et al.*<sup>5</sup> (2020) a significant portion (36.7%) mistakenly believes that disaster management is solely the responsibility of healthcare workers, revealing a critical misconception. While 65% of participants find disaster management literature accessible and 68.3% find it understandable, a notable minority (35% and 32.7%, respectively) struggle with these aspects. In a study by Nasir *et al.* (2023) 81.6% of participants agreed that disaster preparation is essential for all healthcare personnel, not just doctors or nurses.<sup>6</sup> In the present study, sufficient support from

local officials (66.7%) suggests confidence in governance-level disaster response; however, one-third of participants remain uncertain, indicating room for improvement in public communication and assurance. The data reveals that only 26.7% of participants were fully knowledgeable about the major components of the disaster plan, while 33.3% had partial knowledge and a significant 40% were not familiar with the components at all. Similar results were found in the study by Younis *et al.*<sup>5</sup> (2020) where 92% of participants knew what a disaster is and what a disaster plan entails. Additionally, Nasir *et al.* (2023) found that 72.4% of participants did not know the major components of the disaster plan.<sup>6</sup> The present study also found that 58.3% of participants were aware of the potential risks and emergencies in the country. While this majority indicates a reasonable level of risk awareness, it also shows that 41.7% of participants may not fully understand the specific risks they face.

### Specific knowledge and practical aspects

The principle of triage is well understood by 90% of participants, demonstrating strong knowledge in this critical area. The majority (91.7%) are aware of the hospital's emergency plan; however, there is a slight decrease (65%) in those familiar with the hospital's emergency evacuation procedures, indicating a gap in specific procedural knowledge. In contrast to our findings, a study by Tassew *et al.* (2022) reported that 58.9% of participants were unaware that their hospital had a catastrophe plan.<sup>7</sup> A high percentage (88.3%) agreed that realistic on-scene training is essential, reflecting an appreciation for practical, hands-on training. Nearly all participants (96.7%) recognize that disaster management is a system-oriented specialty involving multiple responding agencies, reinforcing their understanding of the collaborative nature of disaster response. Awareness of the disaster plan's location is low, with only 43.3% knowing where to find it. This represents a critical area for improvement, as quick access to the plan is essential during a disaster. While most participants (93.3%) know what drills are and 83.3% understand their roles during a drill, there remains a portion of staff who may need further clarification and training regarding their specific responsibilities. A cross-sectional study by Nargesi *et al.* (2024) found that knowledge of disaster management among participants was moderate, attributed to the fact that 80.4% had not attended any training courses on disaster management. This indicates that effective knowledge of disaster plans cannot be achieved without proper education on their components.<sup>8</sup>

### Recommendations to improve knowledge

Educational initiatives should emphasize that disaster management is multidisciplinary, involving various sectors

beyond healthcare. Efforts should focus on enhancing the accessibility and comprehensibility of disaster management literature, along with improving information dissemination through regular training and effective communication channels. Specific training on hospital emergency evacuation procedures and realistic on-scene training is crucial. Regular drills, disaster simulations, and comprehensive educational materials are essential for preparedness. Public awareness campaigns and community involvement should be encouraged, with regular assessments to adjust strategies as needed.

### Disaster management practices

The assessment of disaster management practices reveals various strengths and weaknesses in the current system, providing insights into areas that require improvement to enhance preparedness and response capabilities.

### Participation in drills and exercises

Only 10% of participants regularly engage in disaster management drills and exercises. While 33% participate rarely, 36.7% do so occasionally, and 20% never participate. This highlights a significant gap in regular involvement with disaster preparedness activities. Consistent participation in drills is crucial for maintaining readiness and ensuring that all individuals are familiar with their roles and responsibilities during a disaster. Perceptions of disaster management practices vary among participants: 10% feel that the practices are very effective, 46.7% consider them effective, a substantial 33.3% remain neutral, and 10% find them ineffective. This mixed perception suggests that while some aspects of disaster management practices are functioning well, others may need reassessment and improvement. In a similar study by Nasir *et al.* (2023) only 36.6% of participants felt that hospital preparedness was adequate.<sup>6</sup> A majority (63.3%) acknowledged that disaster drills are conducted in the hospital; however, the fact that 70% reported no ongoing training indicates a disconnect between the occurrence of drills and the provision of continuous training. Regular and ongoing training is essential to keep skills sharp and ensure that staff remain prepared for emergencies. Similar results were observed in the study by Younis *et al.*<sup>5</sup> (2020) where 48% of participants reported that there was no ongoing training being conducted. The study by Singhal *et al.* (2016) also found that perceptions of disaster preparedness training and the execution of drills were largely negative.<sup>9</sup> Approximately 46.7% of participants stated that the disaster plan in the hospital is updated frequently, which is a positive indication that the hospital is actively maintaining its disaster management strategies. However, this also implies that over half of the participants

may perceive the updates as infrequent or may be unaware of them, highlighting the need for improved communication and transparency regarding plan updates. Less than half (45%) of the participants have personal or family emergency plans, which is concerning. Personal preparedness is a crucial component of overall disaster readiness, and encouraging staff to develop and maintain their own emergency plans can significantly enhance their ability to respond effectively during a crisis. The results in this regard align with findings from the study by Reche *et al.* (2016) where 54.7% of participants agreed that individuals and their families are not adequately prepared for a disaster.<sup>10</sup> A striking 95% of participants agree on the need for more workshops and simulated training. This overwhelming consensus underscores the recognition that current training efforts are insufficient and highlights a strong desire for enhanced educational opportunities to better prepare for disasters. Similarly, a cross-sectional study by Shabbir *et al.* (2017) found poor practices, with 83.3% of participants indicating a need for additional training.<sup>11</sup>

### Skills and training assessment

A majority (58.3%) of participants feel their role in disaster management is clear, while 20% do not and 21.7% are unsure. Clarity of roles is vital for an efficient disaster response, and steps should be taken to ensure that all staff understand their specific duties. Additionally, 66.7% feel prepared to handle potential risks and disaster emergencies, whereas 30.3% do not, and 20% are unsure. This indicates a moderate level of confidence but also highlights the need for further training and reassurance. In contrast to our findings, a cross-sectional study by Fung *et al.* (2008) reported that nearly all nurses (97%) felt inadequately prepared for disasters.<sup>12</sup> It was observed that 60% of participants attended workshops or seminars on disaster management, yet only 35% feel that the knowledge gained is sufficient for real situations. This suggests that while educational opportunities exist, their effectiveness may be limited, highlighting the need for a review and improvement of these programs. A high percentage (78.3%) feel that their nursing education has prepared them for disaster scenarios, which is encouraging. However, ongoing professional development is crucial to maintain and enhance these skills. A vast majority (93.3%) are willing to participate in emergency medicine education as part of their continuous professional development, indicating a strong commitment to enhance their skills and knowledge. Over half (56.7%) believe that extracurricular resources such as the Internet, Television, radio, and newspapers provide sufficient readiness for disaster practice, while 43.3% do not. This underscores the importance of incorporating diverse educational tools and resources into disaster preparedness training. Nearly all participants (96.7%) expressed the need

for more training focused on providing patient-centered care during disasters, highlighting a critical area for development to ensure that healthcare providers can deliver effective and compassionate care in emergency situations.

### Recommendations to improve practices

Mandatory, regular disaster drills and continuous training programs with practical exercises are crucial for staff preparedness. Educational interventions should encompass workshops, seminars, and various tools such as digital media and simulations to enhance knowledge and attitudes. Staff should be educated on personal emergency plans and have a clear understanding of their roles during disasters. Additional training should focus on delivering patient-centered care, emphasizing empathy, communication, and practical skills.

### CONCLUSION

The assessment of disaster management practices among hospital staff reveals gaps in practical engagement and procedural knowledge, despite general awareness. There is a strong need for regular, mandatory drills, enhanced training programs, and continuous professional development. By focusing on these areas, hospitals can cultivate a more resilient and prepared workforce capable of effectively responding to disasters and ensuring the safety and well-being of patients and the community.

**Authors' contributions:** AA: Conceptualize and designed the study; AA and KT: Recruited patients and acquired data; RS and DC: Data analysis and interpretation; AA and DC: Manuscript drafting.

**Ethical approval:** The research/study approved by the Institutional Review Board at University College of Medical Sciences and Guru Teg Bahadur Hospital, Dilshad Garden, Delhi, number GTBHEC2024/P-209, dated 08<sup>th</sup> April 2024.

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