

# Emergency Nurses' Knowledge, Attitude and Practices Regarding Disaster Preparedness and Management in Emergency Departments in the Northern Division, The Republic of Fiji

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## ABSTRACT

**Background:** Since the adoption of the Hyogo Framework for Action (HFA), substantial efforts have been undertaken globally to reduce the impact of disasters. Nevertheless, individuals, families, communities and nations continue to be adversely affected. As front-line responders, nurses play a pivotal role in supporting communities during emergencies and crises. This study aimed to assess the knowledge, attitudes and practices (KAP) of emergency nurses in the Northern Division of Fiji regarding disaster preparedness and management, and to examine factors associated with these outcomes.

**Methods:** A descriptive, quantitative cross-sectional study was conducted using a self-administered questionnaire distributed to emergency nurses working in divisional and sub-divisional hospitals and health centres across the Northern Division of Fiji.

**Results:** A total of 61 nurses participated in the study, representing a 93.8% response rate. Most respondents were based in hospitals and health centres (82%). Overall, participants demonstrated adequate knowledge and positive attitudes towards disaster preparedness and management; however, fewer than half reported good practices, and less than half were aware of their institution's disaster management policies and procedures. Nearly three-quarters had never read or seen the health disaster management policy, and 77% had never undergone disaster preparedness training. No significant associations were found between participants' sociodemographic characteristics and their KAP scores.

**Conclusion:** Despite frequent disasters in Fiji, emergency nurses in the Northern Division showed a gap between knowledge/attitude and practice in disaster management. These findings underscore an urgent need for a comprehensive disaster management policy and structured training to strengthen emergency nurses' preparedness and response capacity in the region.

**Keywords:** Disaster management; Disaster preparedness; Knowledge; Attitude; Practice; Disaster nursing

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## INTRODUCTION

Although the Hyogo Framework for Action (HFA) has promoted disaster-risk reduction worldwide, disasters still cause substantial human and economic losses, especially in Pacific Island nations such as Fiji (1). According to the United Nations Office for Disaster Risk Reduction (UNDRR) (2), excluding the impacts of the COVID-19 pandemic, over the past decade, more than 700,000 people have died globally, and over 1.4 million have been injured. Additionally, about 23 million people have been displaced by disasters. Moreover, over 1.5 billion people have been affected in various ways, with women, children, and vulnerable groups disproportionately impacted, and total economic losses estimated at more than \$2.5 trillion (3).

Many disasters are worsened by climate change, and the increasing frequency and severity of such events significantly hinder progress towards sustainable development, which depends on preparedness. Despite this global context, there is limited evidence from the Pacific, particularly from Fiji, on how health professionals, especially nurses, prepare for and respond to disasters.

Much of the focus on disaster preparedness emphasises strengthening the capacity of Emergency Medical Teams (EMTs), enabling them to respond swiftly and effectively to disaster situations by establishing frameworks for deploying medical and rapid response teams (4). The World Health Organization (WHO) provides recommendations on the necessary education and training to ensure efficient and proper readiness when teams are needed, as disasters can cause social and psychological upheaval and loss of life, affecting health services. As the initial point of clinical contact for disaster victims, emergency department (ED) nurses play a vital role in any EMT response. Hospitals, as a crucial component of effective disaster response, often fail to respond adequately to disasters, resulting in increased deaths and injuries, delays in trauma treatment, higher risks of disease outbreaks, and potential setbacks in recovery efforts (5,6).

Following the earthquake and tsunami in Japan in 2011, 11 hospitals fully collapsed, and over 200 were damaged in some way (5). In Aceh, Indonesia, following the 2004 tsunami, it was

estimated that more than 60% of health facilities were destroyed (1). Similarly, Day and the team reported that after Cyclone Winston in 2016 in Fiji, more than 88 health facilities were either destroyed or damaged (7). Consequently, 91% of all deaths due to weather, climate, and water hazards occurred in developing nations, with 82% in low- and middle-income countries. Despite Fiji's high disaster exposure, no published studies have evaluated the preparedness of its emergency nurses. Additionally, natural disaster losses are expected to increase, partly driven by socioeconomic trends such as urbanisation and the effects of climate change (8).

Fiji is a developing island nation comprising 300 islands. It spans about 1.3 million square kilometres in the South Pacific Ocean. Fiji is located near the Ring of Fire, which heightens the country's vulnerability to natural disasters (2). The World Risk Index (WRI) ranks Fiji as the 12th most hazardous country in the world, due to high exposure to natural hazards and limited coping capacity (7). An International Monetary Fund (IMF) study in 2017 estimated that Fiji has a 70% chance of experiencing a major natural disaster each year (9). Tropical Cyclone Winston in 2016 was the most intense tropical cyclone to make landfall in Fiji, killing forty-four people nationwide and destroying over 60% of health facilities (10). About 40,000 homes were damaged or lost, with the storm's total damage reaching FJ\$2.98 billion. Fiji's topography means that 90% of the population lives in coastal areas vulnerable to flooding, cyclones, and sea-level rise, amid a general lack of climate-resilient housing throughout the country (11,12).

Although the WHO has acknowledged the need for safer hospitals, significant progress has been made over the past 20 years to enhance hospital resilience. However, evidence indicates that many hospitals and healthcare personnel in the Asia-Pacific region remain relatively unprepared and unprotected (13). Fiji has established a highly efficient and effective national disaster response system. However, no previous studies have assessed the preparedness and disaster management knowledge of nurses, especially those working in emergency departments across the country. Little is known about how these frontline nurses recognise and respond to disasters within Fiji's national framework.

Nurses play a vital role in caring for individuals and communities affected by natural disasters. However, a lack of knowledge, inadequate practice, and negative attitudes towards disaster management can negatively influence the quality of care and response. Therefore, this study aimed to determine the proportion of emergency nurses in the Northern Division of Fiji who demonstrate sufficient knowledge, a positive attitude, and good practices related to disaster preparedness and management.

## METHODS

### Study Design and Setting

A descriptive cross-sectional design was conducted among nurses working in Emergency Departments (EDs) across the northern division of Fiji. Approximately 70% of the population lives in Viti Levu (where Suva is the capital), and 15% resides in Vanua Levu, the next largest island. Fiji has three divisional hospitals, 18 sub-divisional hospitals, and 84 health centres distributed across numerous islands to serve a population of nearly one million. This study was conducted in Vanua Levu and included RNs from one divisional hospital, two sub-divisional hospitals, and five health centres.

### Population and Sample

An estimated 300 RNs work in the emergency department across Fiji. Due to the geographical topography, where hospitals and health centres are scattered throughout the country, this study focused solely on the northern division. Convenience sampling was utilised, and the questionnaire was distributed to all nurses working in the ED or attending emergency cases in the north division. Sixty-five questionnaires were distributed to participants in a cross-sectional survey, and 61 questionnaires were completed and returned to the investigator, resulting in a response rate of 93.8%.

### Instrument Reliability and Validity

The study used a questionnaire initially developed by Ahayalimudin in 2012 (14) and later employed by Ahayalimudin and Osman (2016) (15) in Malaysian hospitals. This instrument was specifically created to evaluate emergency nurses' knowledge, attitudes, and practices towards disaster preparedness and

management. For this research, the questionnaire was adopted with permission (obtained via email) and then adapted to suit the healthcare setting in the Northern Division of Fiji. Besides the original domains of socio-demographic characteristics, knowledge, attitude, and practice, an additional domain on the availability of disaster policy and training was included to reflect local policy and training conditions better.

The revised instrument included 13 knowledge items, an 11-item attitude scale, eight practice items, and six general questions. Knowledge and practice items were in Yes/No/Unsure format, with one point for correct answers and zero points for incorrect or "Unsure" responses. The attitude scale used a five-point Likert scale from "strongly agree" (score 5) to "strongly disagree" (score 1), with reverse scoring for negatively worded items. Maximum scores were 13 for knowledge, 55 for attitude, and 8 for practice. A 60% cut-off was used to distinguish adequate from inadequate knowledge, good from poor practice, and positive from negative attitudes.

Several items were carefully adapted to ensure cultural and contextual relevance without compromising the original structure. For example, the question on disaster training removed options such as didactic lectures and functional exercises, which are uncommon in Fiji, and added an "Other (please specify)" option. One knowledge item based on Malaysian guidelines was removed. In the practice domain, the term "uncertainty" was replaced with "unsure" to simplify the wording. The question "Do you know where the disaster plan is kept?" was rephrased as "Do you know if your health facility has a disaster management plan? If yes, where is it kept?" with options such as the sister's office, nurse's desk, or doctor's room. Likewise, the item "Does disaster training involve other agencies such as Civil Defence (JPAM)?" was replaced with agencies available in Fiji, including the police and firefighters. These modifications were implemented to improve clarity and to elicit more accurate responses from participants.

The original instrument demonstrated strong psychometric properties, with Cronbach's alpha values above 0.70 for knowledge and practice and 0.66 for attitude. Face and content validity were established by an emergency medicine

specialist, public health physicians, and a questionnaire-development expert. To ensure these properties were maintained after localisation, the adapted questionnaire was pilot tested with 10 nurses in Fiji. Minor adjustments were made following the pilot, such as replacing tabletop exercises with drills and substituting references to enrolled nurses with registered nurses, while preserving the integrity of the original instrument. Reliability testing of the adapted tool in this study showed moderate reliability for the attitude domain ( $\alpha=0.56$ ), an  $\alpha$  of 0.63 for the general preparedness section, and acceptable internal consistency for the knowledge ( $\alpha=0.61$ ) and practice ( $\alpha=0.58$ ) domains.

### Data Collection

A self-administered questionnaire was used to gather data on emergency nurses' knowledge, attitudes, and practices regarding disaster preparedness and management at Labasa Hospital, Savusavu Hospital, Nabouwalu Hospital, and five other health centres in the Northern Division of Fiji. The student researcher personally delivered an envelope containing the questionnaire, consent form, and participant information sheet to each eligible nurse. During delivery, the purpose of the study was verbally explained, emphasising voluntary participation and confidentiality. Participants were instructed to complete the questionnaire and consent form and return them to the researcher, while the information sheet remained with them for reference.

Out of the 65 distributed questionnaires, 61 were completed and returned, resulting in a response rate of 93.8%. After collection, the completed hard-copy questionnaires were securely stored in a locked cupboard. Data were entered into a password-protected file on the student researcher's personal computer, accessible only to the researcher and the academic supervisor. All questionnaires and data files will be securely retained for two years in accordance with ethical guidelines.

### Data Analysis

All questionnaires were coded to ensure anonymity, and any personally identifiable information was removed before data entry. Data were initially entered into Microsoft Excel and then exported to SPSS Version 27 for statistical analysis. The instrument included 13

knowledge items, an 11-item attitude scale, eight practice items, and six general questions. In line with the scoring method used in Ahayalimudin's research, a 60% cut-off point was applied to differentiate adequate from inadequate knowledge, positive from negative attitudes, and sound from poor practices. Descriptive statistics (numbers and percentages) were used to summarise socio-demographic characteristics and domain scores. Associations between demographic variables and respondents' practices were analysed using the Chi-square or Fisher's exact test, with a  $p$ -value of  $\leq 0.05$  considered statistically significant.

### Ethical Considerations

Facility approvals for the study were obtained from the Medical Superintendent of Labasa Hospital, the Divisional Medical Officer of the Northern Division, and the Permanent Secretary for Health and Medical Services. Ethical approval was granted by the College Health Research Ethics Committee (CHREC). Privacy, anonymity, and confidentiality were maintained throughout the research process. Participants' names were not recorded in the data set, and raw responses were accessible only to the student researcher and academic supervisors. All electronic data was stored securely on a password-protected laptop, with backup files saved to Google Drive and destroyed once no longer needed. Participants were fully informed, both verbally and in writing, of the study's purpose and of their right to decline or withdraw from participation at any time without penalty. Each participant received an information sheet outlining the study and provided written informed consent before completing the questionnaire.

### RESULTS

A total of 61 emergency nurses participated in this study, representing one major hospital, two sub-divisional hospitals and five health centres across the Northern Division of Fiji (**Table 1**). Participants ranged in age from 23 to 54 years, with 57.4% under 30 years old, reflecting a relatively young workforce. The sample was predominantly female (85.2%,  $n=52$ ), with only nine male nurses (14.8%). Regarding educational attainment, the majority (90.2%) held a bachelor's degree. In comparison, only 4.9% possessed a diploma, and another 4.9% had postgraduate qualifications, underscoring

the limited number of nurses who have advanced their education beyond the undergraduate level. No statistically significant

associations were observed between demographic variables and participants' reported practices.

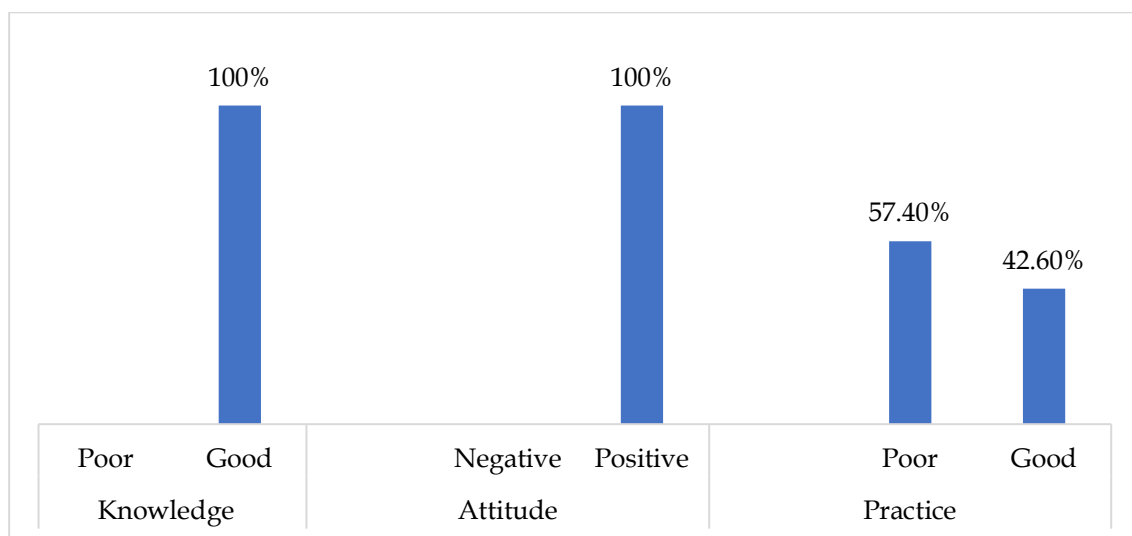
**Table 1:** Demographics of Study Participants (N=61)

Variables	Frequency (f)	Percentage (%)
Age		
<30	35	57.4%
≥30	26	42.6%
Gender		
Male	9	14.8%
Female	52	85.2%
Education Level		
Diploma	3	4.9%
Bachelor	55	90.2%
Postgraduate	3	4.9%
Workplace		
Hospital	20	32.8 %
Sub Divisional Hospital	11	18 %
Health Centre	30	49.2%
Experience(years)		
<5 years	19	31.1%
≥5 years	42	68.9%

**Figure 1** illustrates that nurses demonstrated adequate knowledge—defined as scoring ≥60%—in identifying disasters, understanding their impacts and recognizing the importance of a multidisciplinary response. They also exhibited a positive attitude toward participating in disaster preparedness and

pursuing professional development. However, fewer than half of the respondents met the ≥60% threshold for readiness to provide standardized disaster management practice. This discrepancy highlights a gap between theoretical knowledge/attitude and practical preparedness.

**Figure 1:** Classification of Knowledge, Attitude, and Practices of the Total Population (N=61)



More than half of the participants (51%) reported that their hospital or health centre did not have a specific disaster management policy. This absence likely reflects broader organisational barriers, such as limited institutional prioritisation, inadequate resource allocation or the lack of a centralised policy framework. Although disaster preparedness and management training are essential for

maintaining critical services during emergencies, only 23% of participants had attended any form of disaster management training since commencing work with the Ministry of Health (Table 2). These findings suggest an urgent need to strengthen institutional policies and training programmes to ensure emergency nurses are fully prepared for disaster response (Table 2).

**Table 2:** The Presence or Absence of A Specific Disaster Management Plan and The Level of Training Nurses Attended (N=61)

Items	Frequency (f)	Percentage (%)
Is there any specific disaster preparedness and management plan in your hospital/health centre that caters to different events? (e.g., for floods, cyclones, communicable diseases, and significant incidents)		
Yes	23	37.7
No	31	50.8
Unsure	7	11.5
Have you ever attended a disaster management training or education program since you started to work?		
Yes	14	23.0
No	47	77.0
Lecture		
Yes	7	11.5
No	54	88.5
Group Discussion		
Yes	7	11.5
No	54	88.5
Field Simulation		
Yes	4	6.6
No	57	93.4
Disaster Drill Exercise		
Yes	8	13.1
No	53	86.9

## DISCUSSION

To the best of our knowledge, this is the first study to examine the knowledge, attitudes and practices of nurses in Fiji regarding disaster preparedness. However, the findings revealed that nurses possessed adequate knowledge and demonstrated a positive attitude towards disaster preparedness; only 23% had ever attended disaster preparedness training. This highlights a substantial gap between theoretical understanding and practical application, suggesting that emergency nurses in the Northern Division remain inadequately prepared to mitigate the effects of disasters on affected populations. Tailor-made training programs are therefore urgently needed to

strengthen practice competencies, as only 43% of respondents indicated awareness of appropriate actions to take during a disaster.

The importance of in-service training, lectures and disaster drills for nurses has been emphasised by several studies (14-16). Each health facility should design and deliver its own educational programme to equip all nurses expected to respond to disasters (17-19). Training should be continuous and integrated with opportunities to upgrade qualifications. However, our findings show that a tiny proportion of emergency nurses in the Northern Division have pursued further education. Only 4.9% of participants held a postgraduate degree, contrasting sharply with recommendations that

doctoral qualifications are essential for developing emergency nurses' specialist knowledge, critical decision-making skills and confidence during disasters (20,21). These results indicate a dual need: encouraging nurses to upgrade their qualifications to postgraduate level and providing institutional support, such as scholarships or study leave, to make further education feasible.

Awareness of disaster preparedness and management policies and procedures was also low. Only 43% of the emergency nurses surveyed knew about the appropriate policies in their institution, and 72.1% had never read or seen their hospital or health centre's disaster management policy. Furthermore, 50.8% of nurses reported that their facility lacked a specific disaster management policy (see **Table 2**). This contrasts with the findings of Ahayalimudin (15), in which most nurses were aware of relevant policies and practised according to expected standards. The absence of clear policies in Fiji hinders standardised practice and may compromise patient care during disasters.

The challenges faced by nurses in providing optimal care during disasters are well documented (16). Hospitals, particularly emergency departments, should establish and disseminate detailed policies and procedures to ensure a coordinated disaster response system, adequately trained staff, sufficient supplies and safe response spaces (17). Protocols, clear guidelines, checklists and other standard operating procedures would help emergency nurses deliver care in a structured and consistent manner. This is supported by international evidence: a study in the Philippines found that more than half of nurses were unfamiliar with their institution's disaster management protocols. It recommended the development of comprehensive protocols (22). Similarly, research in Indonesia emphasised the importance of a comprehensive disaster plan that encompasses coordination, response and recovery planning, as well as communication, logistics, evacuation, human resources, finance, patient care, psychological support, decontamination, and security (23). Policies aligned with the Ministry of Health's strategic plan and endorsed by professional bodies such as the Australasian College for Emergency Medicine (16) could strengthen preparedness and response at the facility level.

The findings of this study also demonstrate that emergency nurses have a sound understanding of identifying a disaster, recognising its impact and determining which stakeholders should be involved in the response. This is consistent with research conducted in Malaysia, where nurses and other healthcare personnel in three hospitals were found to have adequate disaster management knowledge. However, it is essential to note that the knowledge questions in both studies did not directly measure nurses' competence in responding to real-world disaster events. Given the low levels of training and the limited number of formal disaster plans within health facilities, it is likely that nurses' actual capacity to respond effectively to disasters remains constrained.

Nevertheless, the high knowledge scores observed are encouraging and may be related to participants' years of experience. In this study, 68.9% of respondents had  $\geq 5$  years of experience, a pattern consistent with Usher and colleagues, who found that knowledge scores were higher among more experienced nurses (24). A positive attitude and curiosity toward learning, combined with active involvement in disaster preparation, are also significant. However, adequate knowledge alone may not translate into effective practice without ongoing commitment to education, training and engagement at both individual and organisational levels.

Encouragingly, the nurses surveyed in this study expressed willingness to engage in disaster preparedness and management programmes, reflecting a positive attitude toward disaster readiness. This finding aligns with previous studies reporting nurses' interest in disaster mitigation and preparedness (14, 15, 21) and contrasts with a study in Iran, where nurses displayed negative attitudes (25). Despite Fiji's frequent exposure to disasters, only half of the respondents reported that disaster training or education was conducted in their health facilities. This confirms a lack of structured training for emergency nurses in the Northern Division.

Taken together, these findings point to the urgent need for a comprehensive disaster management policy for emergency departments across the Northern Division, supported by compulsory scheduled education and training for all emergency nurses. The development, implementation and consistent availability of

such policies and training would strengthen disaster preparedness and response capacity, translating nurses' positive attitudes and theoretical knowledge into effective practice during actual disaster events.

## CONCLUSION

This study reveals that although emergency nurses in Fiji's Northern Division possess adequate knowledge of disaster identification and demonstrate positive attitudes, these attributes do not necessarily translate into full preparedness or proper response. Opportunities to develop and strengthen nurses' competencies in disaster planning and management are urgently needed to ensure practical and efficient responses. Achieving this requires not only adequate knowledge and positive attitudes but also standardised disaster preparedness and management practices. Continuous training, education and drills explicitly tailored for nurses are essential to build and sustain these skills.

The findings are highly relevant to Fijian policymakers and have broader implications for Pacific Island countries, which continue to face frequent and severe disasters. By highlighting existing gaps, this study provides critical insights into the preparedness of emergency nurses. It underscores the need for comprehensive disaster management policies, as well as compulsory, scheduled education and training across emergency departments. Such measures will help strengthen frontline healthcare systems and improve community resilience. Future research involving larger, more diverse populations is recommended to identify sociodemographic factors associated with knowledge, attitudes and practices, and to guide the development of evidence-based training and policy interventions for disaster management in the Pacific region.

## Strengths, Limitations and Future Direction

To the best of our knowledge, this is the first study conducted in the Pacific region to assess emergency nurses' knowledge, attitudes, and practices regarding disaster preparedness and management. The study achieved a high participation rate of over 90%, with 61 nurses from the Northern Division representing approximately 20% of Fiji's estimated 300 emergency nurses. This division is one of the country's most disaster-prone areas, which

enhances the relevance of the findings. Although the sample was drawn from only one geographic division, the results may be widely applicable to other nurses in Fiji and potentially to other Pacific nations facing similar disaster risks.

Several limitations should be considered when interpreting the findings. The cross-sectional design captures only a snapshot in time and cannot establish causal relationships. Convenience sampling may have introduced selection bias, and reliance on self-reported questionnaires, particularly for the practice domain, may be influenced by social desirability bias, potentially overstating positive behaviours. Although the original instrument was contextualised and pilot-tested in Fiji to ensure cultural relevance, a formal factor analysis would be necessary in future research to strengthen the questionnaire's psychometric properties further and confirm its validity for Pacific settings.

## Implications of Practice among Emergency Nurses

This study underscores the urgent need for comprehensive disaster management plans and policies within every emergency healthcare facility. The findings provide actionable evidence for policymakers and health administrators to prioritise the development and implementation of clear operational policies, protocols and guidelines to standardise disaster response across institutions. Equally important is the establishment of regular, ongoing and competency-based training for healthcare staff, particularly emergency nurses who are at the forefront of disaster response.

Beyond Fiji, other Pacific nations facing similar vulnerabilities can draw on this study's approach and findings to strengthen their own emergency preparedness systems. Given the increasing frequency and severity of disasters anticipated as a result of climate change, it is imperative that Fiji recognises and elevates the critical role of nurses in disaster response. Developing robust operational policies, allocating adequate resources and providing tailored training programmes will equip nurses to respond effectively and safely, ultimately improving patient outcomes and community resilience during disasters.

## Recommendations for Policy and Education

Based on these findings, several actions are recommended to strengthen disaster preparedness among emergency nurses. At the policy level, the Ministry of Health and hospital administrators should mandate the development, dissemination and regular review of comprehensive disaster management plans for all emergency departments and health centres. These plans should include clear roles, responsibilities and communication protocols to ensure a coordinated response. At the educational level, disaster preparedness training should be made compulsory, competency-based and recurrent, integrating lectures, drills, simulation exercises and multidisciplinary collaboration. Institutions should also support nurses in advancing their qualifications, such as through scholarships, study leave or postgraduate programmes in emergency and disaster nursing. Together, these measures would help bridge the gap between knowledge, attitude and practice, equipping emergency nurses to respond effectively and safely during disasters while fostering a culture of resilience within the healthcare system.

## CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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## AUTHOR CONTRIBUTIONS

**AAP:** Designing the study methods, analytical strategies, managing recruitment of participants, writing the manuscript, performing data collection and data analysis.

**DB:** Critically reviewing and editing the manuscript, refining structure, improving clarity, ensuring flow.

**KS:** Guiding the research process, providing oversight, mentoring the research team.

**SS:** Reviewing and institutional support.

**NAA:** Verifying the accuracy and reliability of methods, data, tools, or processes, critically reviewing and editing the manuscript, refining structure and improving clarity.

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