



# What Should Public Health Nurses Do in the Preparedness Phase of Disaster?

Ardia Putra<sup>1</sup>, Hajjul Kamil<sup>1</sup>, Yuswardi Yuswardi\*<sup>1</sup>, Elly Wardani<sup>1</sup>

Department of Nursing Management, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia

## Abstract

Disasters will lead to various problems in the community that cannot be resolved through standard procedures and require the assistance of other resources. Natural and human-caused disasters have been and will continue to occur throughout the world. This event strongly encouraged the nursing profession to develop a strategic plan to address the situation, which challenges the Public Health Nurses (PHNs) to handle catastrophic situations. The goal of the study was to explore the perceived knowledge and skills of PHNs in disaster management. A systematic review approach was applied; sources of information derived from the literature were obtained through various methods. In this study, the knowledge and skills of the PHNs in disaster management are discussed at the disaster preparedness stage (disaster risk and population identification, including inter-agency collaboration). PHNs should always be aware and ready for the future disaster occurrences by enhancing their knowledge and heightening their clinical practice skills, particularly in disaster management. In addition, the collaboration among the health department and other institutions is required to develop regular disaster drills between health-care providers and communities to enhance self-awareness and preparedness regarding emergency and disaster events.

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**\*Correspondence:** Yuswardi Yuswardi, Department of Nursing Management, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia. E-mail: [yuswardi@unsyiah.ac.id](mailto:yuswardi@unsyiah.ac.id)  
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## Introduction

Disaster can be defined as an ecological disturbance or an emergency event with severity and magnitude that results in death, injury, illness, human suffering, economic and social disruption [1], damage to community property, disruption of community functions, and the need for the assistance of external resources to maintain essential services [2]. In addition, disasters also produce many problems throughout the community that cannot be solved using regular procedures and require assistance from other resources [3].

The biggest earthquake and Tsunami in late 2004 in Aceh and parts of North Sumatra have killed hundreds of thousands of people. Then, in 2005, Nias Island was rocked by an earthquake and killed more than 1000 people [4]. In addition, in 2010, a series of natural disasters came and went in Indonesia, such as the Tsunami in Mentawai, floods, landslides in Wasior, and volcanic eruptions in Yogyakarta [5]. Each of these events has caused various substantial effects on the affected area [6].

Natural and artificial disasters have occurred at record highs worldwide. This incident is a high consideration for the nursing profession to develop

a strategic plan to deal with the situation [7] because nurses have a central role in providing or providing care in disaster events [8].

As a major group of health-care workers, nurses must train and equip themselves with a series of competencies to deal with disasters to save lives and protect health victims [9]. In addition, Public Health Nurses (PHNs) will be one of the disciplines that must be actively involved in disaster management programs [10]. The PHNs involvement in disaster management must be equally considered in all phases of a disaster phase [11]. To be actively involved in these phases, they need basic knowledge and skills regarding disaster management [12], which will help them to work effectively when a disaster occurs [13].

Indonesia has, in recent years, changed its disaster management strategy. Therefore, the participation and responsibility of various intersectoral entities are crucial, including government agencies, non-governmental organizations, the community, and health service providers, especially nurses [14]. Sultan *et al.* stated that the International Council for Nurses had reminded all nurses to have adequate knowledge to respond effectively to disaster events [9]. Florence Nightingale has been shown her essential role as a nurse when treating victims of the Crimean war,

which opens the world's eyes to how important the responsibility of health-care workers is [9].

This literature study explores the PHNs' knowledge and perceived skills in the preparedness phase of disaster management. The specific goals of the study are to examine disaster management guidelines at the preparedness stage and describe the PHNs' knowledge and perceived skills in the preparedness phase.

When a disaster occurs, nurses must provide physical, psychological, and holistic care to individuals and community groups by prioritizing vulnerable groups, including pregnant women, children, and elder people [15]. Therefore, the knowledge and perceived skills for PHNs in disaster management are discussed in the preparedness phase. With the development of disaster management guidelines and practices among PHNs in Indonesia, it is hoped that it will provide appropriate direction for PHNs and significantly reduce the impact of disasters across the country.

## Materials and Methods

This study uses a systematic review approach. Sources of data in this study derived from the literature obtained through various methods: Direct literature study, as well as using the internet to search for research results from local, national, and international online libraries. In this study, references based on inclusion criteria were included: Articles in English (primary) and Indonesian (addition) for research papers, guidelines/standards from organizations, and books or e-book that relevant to disaster management in the nursing view from the community and clinical areas. In addition, the review articles answered the research question: Are there guidelines for disaster nursing or disaster management in place? The exclusion criteria were articles inconsistent with the research question and published over the past 20 years.

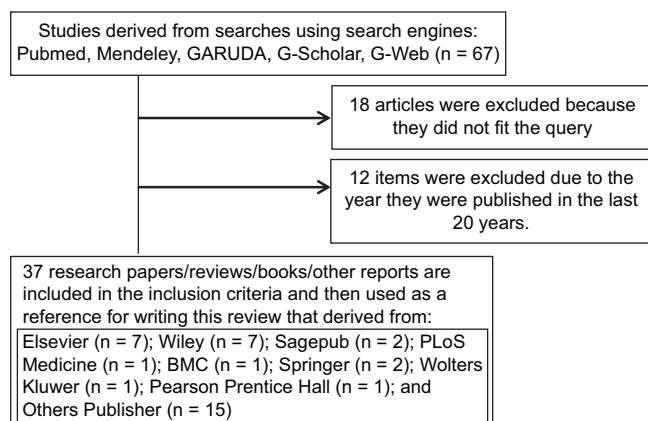


Figure 1: Searching methods

Various methods were applied to search reviews, articles, and other comprehensive reports from

Table 1: Characteristic references

Type of article	Date of publication	Methods
Research article (n = 15)	2002–2007 (n = 16)	Research article:
Review article (n = 13)	2008–2013 (n = 11)	• Descriptive Study: Survey, correlative, and comparative
Guidelines (n = 4)	2014–2020 (n = 10)	• Mixed methods
Book/eBook (n = 4)		• 3-round Delphi approach
Online newspaper (n = 1)		• Qualitative
		• Pilot study
		Review article:
		• Review research
		• Review the theoretical and policy
		• Review document of law and act
		• Educational standards for disaster care

conventional nursing and health databases. Databases were used (Figure 1) from 2002 until 2020. In addition, universal entry websites of cases such as Google-web and Google-scholar were utilized. Articles that meet the requirements or criteria (e.g., at Elsevier publishers) are systematically selected.

One researcher carried out the literature search seven times, beginning on April 1–September 30, 2021. Several keywords were used to obtain these papers, including disaster management, preparedness phases, the role of nurses/PHNs, disaster nursing, and PHN. After passing through a systematic search above, 37 references were chosen for this writing. Details are described in Table 1.

## Discussion

### Disaster management guidelines

Nowadays, the incidence and frequency of disasters have been increasing as they occur approximately every 2 months in some areas worldwide [16]. As a result of environmental degradation, global climate change also generates a new problem related to weather pattern disturbance and its consequences in the future, particularly threatening human health [17]. The engagement of the nursing profession in disaster management aims to provide utmost care within limited resources and equipment in chaotic situations [18].

Conversely, many nurses acknowledged themselves as less appointed to work and act in important legislation, policy systems, and regulations that can improve and sustain the practice in any situation [19]. These conditions make them often feel inadequately prepared and integrated with National Disaster Policy and Response Teams to accomplish their crucial role in disaster prevention, response, and recovery [13]. Consequently, their contribution to the national action plan to enhance their knowledge and practices concerning disaster management is limited.

To deal with these circumstances, a guidance document on disaster management is needed to

**AQ4 Table 2: Summary of disaster management guidance at the preparedness stage**

Population	A phase of disaster management	Competencies in each phase	Author, country
All components of health sectors, including the public health system, PHNs, and communities	Preparedness: Aims to develop decision making in preparing for disaster event that will include planning, training/education, resource management, and exercising	Preparedness 1. Identify and develop the disaster plan among health-care providers 2. Conduct a training and education program to provide the appropriate knowledge and skill to implement the plans 3. Identify resources such as plans, equipment, and staff to respond to the disaster 4. Practice the present knowledge and skill into a practice scenario or disaster drill	[23], Canada
Health sectors	Warning It aims to deliver an adequate warning to the community regarding disaster events	Warning 1. Inform the community regarding disaster event 2. Identify source, content, and mechanism for warning if a disaster occurs	[24], Sri Lanka
Occupational and environmental health professionals' including nurse	Pre-event Pre-event refers to being well prepared for public health care to face the disaster event Post-event (recovery)	Pre-event 1. Establish a disaster preparedness and response committee 2. Develop a chain of command for communication, decision making, and reporting 3. Define the potential work area, resources, or equipment for emergencies 4. Disseminate the developing disaster plan 5. Develop evacuation plans for normal and vulnerable populations 6. Identify the risk of hazards or disaster 7. Set procedures and teach staff how to report an emergency 8. Plan for a backup system for any vital document and record 9. Perform disaster exercises at least yearly	[1], USA
Community/PHN (C/PHNs)	Phase I (Pre-disaster) Assessment, planning, and implementation as the primary roles of C/PHNs in this phase	Phase I (Pre-disaster) 1. Assess the potential resources and risks in a work setting 2. Plans for disaster action included appropriately allocated resources, defining the roles of C/PHNs in a disaster event, developing cooperative agreements with community agencies, developing or activating disaster assessment tools/plans, developing training/educational programs, and training the volunteer disaster nursing opportunities 3. Practice the developed disaster plan	[20], USA

PHNs: Public Health Nurses.

enable PHNs to enhance their knowledge and skills in emergency and disaster preparedness to competently manage disasters [12]. However, according to the Jennings–Sanders [20], the nursing guideline and standard of care on disaster management was still rare due to a lack of direction for nurses. Many organizations and experts have developed guidelines and a nursing disaster management model. These resources are valuable to health-care providers, especially nurses, who can guide and assist them in disaster preparedness, response, and recovery [21], [22]. The details of each guideline are discussed in Table 2.

### ***PHNs' knowledge and perceived skills in preparedness phase***

According to the Institute of Medicine, community (C/PHNs) have a responsibility to support the mission of the public health system to maintain and improve the community or population in healthy condition [21]. With this regard, PHNs should deliver health-care services and help individuals and communities equally regardless of individual economic and social status [11]. An Indonesian health development goal is to achieve a healthy life for every citizen to achieve optimal community health status. Therefore, the Indonesian Ministry of Health proposes the Public Health Center system, namely, Puskesmas, to accomplish this mission [25]. Initially, Puskesmas is the technical implementation unit of the public health district that is responsible for organizing health development in a working area [26].

A basic understanding of disaster science and the critical components of disaster management are crucial for nurses [27], particularly in preparing themselves for disaster preparedness [3]. The quality of disaster management also depends on staff's practice

[28]. Regular practice was found to enhance the knowledge and attributes to modify the attitude of health-care providers [9]. Moreover, practice improves the knowledge and psychomotor skills that influence nurses' competency in making decisions [29], particularly when facing an uncommon situation like a disaster.

The criteria used to determine PHNs' knowledge and perceived skills in this study will consist of the core competencies derived from the fourth disaster management guidelines proposed that are described in Table 2. Although the competencies related to disaster management were not described thoroughly, the essential knowledge and perceived skills for successful disaster management were clearly illustrated in each process of disaster phase. Moreover, other evidence (Table 3) was used to support the specific skills in disaster management for PHNs, included PHNs' roles in the disaster preparedness phase.

In preparedness, PHNs should focus on personal preparation, such as understanding key terms, concepts, and roles in disaster preparation, including disaster plan and communication equipment used during disaster situations [10]. Furthermore, they should identify the types of disaster events that possible attack in their area [28] and assume the vulnerable population threatened by disaster events [22]. From this, core competencies in preparedness and risk reduction required by PHNs include demonstrating the ability to perform: Capacity assessment, planning and implementing prevention and mitigation activities, and planning and implementing emergency preparedness at the community and health facilities level [30]. Furthermore, to improve the present and updated knowledge regarding PHNs roles in disaster preparedness, regular educational training and workshop or simulation exercises or disaster drill will be required to support them further to be qualified staff

**Table 3: Included studies**

Authors, country	Methods	Participants	Context/Objective	Outcomes
[30], South Africa	Mixed methods approaches	n = 6 schools public health of African universities, emergency PHP from Ministries of Health, the US CDC and prevention, and the three levels of the WHO	African health-care workers should possess skills and knowledge to effectively participate in health DRM activities. Three levels of training courses are proposed: Basic, intermediate, and advanced. The pilot test of the basic course among a cohort of PHP in South Africa was also demonstrated	Fourteen core competencies and 45 sub-competencies/ training units grouped into six thematic areas: (1) Introduction to DRM; (2) operational effectiveness; (3) effective leadership; (4) preparedness and risk reduction; (5) emergency response, and (6) post-disaster health system recovery
[9], Saudi Arabia	Non-experimental explorative design	n = 200 registered nurses at the emergency department with fluent English and Arabic language	Knowledge on disaster readiness, the role of the emergency nurses on disaster response, and the correlation of demographic variables with the level of preparedness among the emergency nurses at Ministry of health hospitals	A majority of nurses provided sufficient knowledge about disaster preparedness. Most emergency nurses (55%) were moderately knowledgeable, and 33% were adequately knowledgeable about disaster preparedness
[15], Indonesia	Sequential exploratory mixed-method study	Qualitative study: n = 56 participants: Nurses, disaster survivors, hospitalized patients, members of the Ulama Consultative Assembly of Aceh, and hospital policymakers Quantitative study: n = 150 nurses from three hospitals	Develop a study protocol to assess the effectiveness of the intervention program to improve nurses' disaster response skills	Intervention program with local wisdom approaches such as religion, beliefs, culture, and customs to provide care and support for disaster survivors for nurses This finding is expected to value significantly nursing practice and education, particularly in developing and adopting a disaster nursing education program based on Islam
[35], Philippines	Descriptive survey study	n = 250 nurses in community, hospital, school, clinic, or industrial	Assess and develop an action plan to enhance the role, preparedness, and management of nurses in the event of a disaster Identify nurses in various specialty areas to immediately prioritize the needs of individuals in the event of an unforeseen situation	Variations in characteristic respondents affect their assessment of their roles, preparedness, and management during catastrophic events. Nurses grouped according to demographic variables present similarities and differences in their responses to devastating situations. Young nurses may be aggressive, but older nurses are decisive
[10], USA	3-round Delphi approach	n = PHNs, and directors of nursing from local health departments, state nursing leaders, and national nursing preparedness experts	Reviewed and commented on 49 draft competencies derived from existing documents	Competencies in preparedness focus on personal preparedness; comprehending disaster preparedness terms, concepts, and roles; familiar with the health department's disaster plan, communication equipment suitable for disaster situations; and the role of the PHN in a surge event

DRM: Disaster risk management, PHP: Public Health Practitioner.

in providing care and perform disaster management activities in all disaster phases [31].

### **Identify the risk of disaster and population**

As a vast mass of national disaster preparedness, every nurse, particularly PHNs, also has a significant role in contributing their knowledge and skills in responding to disasters [11] to prevent and diminish the impact of disasters in the community [24]. For example, the nurse should have the skill to identify the type of disaster, either natural or man-made, which can occur in their areas [28], including possible affected populations [22]. People in some particular groups, such as the elderly, physical impairment, and mental health problem conditions, were considered vulnerable populations are need specific concerns [15], [32].

Olu *et al.* [30] affirmed that each PHNs must have the competence to effectively conduct various assessments to reduce risk in the face of disasters. Such assessments include planning and implementing various health prevention and mitigation measures and establishing preparedness interventions at the health and community facilities level. Moreover, the importance of assessing vulnerable populations related to disaster events will provide the opportunity to create a specific plan for them in evacuation when a disaster occurs and delivers nursing care after the event [22].

In general, elderly, disabled, and sensory deficit victims mostly get difficulty and fail to access the evacuation place and survive in uncondusive areas [15], [32]. People with a mental health problem are high-risk for using inappropriate coping strategies

such as isolation, difficulty expressing their needs, and help-seeking [33], including suffering and death during a disaster. Hence, health-care workers should be qualified and knowledgeable in these areas, including resource mobilization and management, essential logistical management, and the application of personnel safety and security measures were considered essential elements of sound public health disaster risk management [30].

The difficulty in evacuating these minority vulnerable groups is also caused by their rejects of assistance or cooperation with the evacuation plan [34]. Olu *et al.* [30] described some of the skills required in this situation. PHNs should be able to demonstrate: The ability to determine, mobilize, and manage resources, the capability to employ logistics management; and, the capability to utilize measures of safety and protection. Thus, data from assessing vulnerable populations provide the opportunity to develop specific evacuation plans or public policy and plan for help and nursing actions that can reduce the potential effects of disasters [22].

### **Inter-agency collaboration**

Since disaster affects people and the community, the disaster victims require assistance from many organizations [21]. Therefore, the collaboration between each organization and profession is needed to be planned [11]. Teamwork and communication are essential between emergency personnel from other disciplines to establish appropriate patient responses [21]. With this regard, PHNs should address

the emergency response plan and strategy used to be ready for disaster.

Consequently, the collaboration between organizations and disciplines is assured during a chaotic environment with limited resources from disaster to maintain adequate assistance and health-care services for the community [18]. In this case, management skills enhance effective coordination and collaboration among public safety agencies by enabling interoperable emergency alerts and incident information across disparate systems [35].

From this, PHNs must demonstrate flexibility in the types of tasks and duties without going beyond their knowledge, skills, and authority. During the initial intervention phase, key challenges include communication and continuity of care across multiple partners with diverse backgrounds and objectives. Inspired by the experiences of Haiti and Aceh, this presentation aims to determine best practices in nursing in the event of a disaster and explore the ethical considerations that arise in such a challenging environment [36].

Another example is that a nurse who typically works in adult nursing could be assigned to a disaster shelter with larger children. In this case, an adequate assessment of the child's health condition may require determining whether another field staff has the specialized knowledge and expertise in child care [15]. In addition, they also need to give consultants using telephone calls or seeking other assistance related to the problem. Moreover, suppose they cannot manage the problem. In that case, they should be familiar with the protocol and have access to communicate with the hospital's medical services and arrange immediate transfer to the hospital [28].

PHNs need to generate detailed inter-collaboration that consists of a list of all organizations and their role in the emergency response, their location, how to access them, and how to stay informed about revisions to plans. Here, PHNs must have managerial skills to perform their nursing functions in the event of a disaster [35].

Furthermore, they should arrange a regular meeting to inform and re-inform the responsibility of each agency and evaluate the plan for effective action [37]. All agencies should also commit to this affiliation to enhance effective communication and collaboration to limit the morbidity and mortality in disaster occurrences [22]. Importantly, PHNs should build trust and strong relationships with stakeholders and people in the community to improve their awareness and readiness for the future disasters [1].

## Conclusion

As a disaster-prone country, Indonesia has been plagued by natural disasters over the past few

decades, which caused a large number of victims. As the largest group of health workers and nurses, in particular, PHNs need to train and equip themselves with a series of competencies to deal with disasters to save lives and protect health victims. PHNs will be one of the disciplines that must be actively involved in disaster management programs. They must respond by prioritizing vulnerable groups by providing physical, psychological, and holistic care to individuals and community groups. To overcome this condition, a guidance document on disaster management is required for PHNs to enhance their knowledge and skills in crisis and disaster preparedness to manage disasters competently. The regular practice was found to enhance the knowledge and attributes to modify the attitude of health-care providers, especially for the PHNs.

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