

## RESEARCH ARTICLE

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# Nurses' Familiarity on Disaster Preparedness in Hospitals

## Abstract

Disasters are frequently experienced in the Philippines with detrimental impact to hospitals and its vulnerable population. Nurses, who are front liners in hospitals during disasters, must be familiar in disaster management. This study determined the extent of familiarity on disaster preparedness of nurses in hospitals, and the significant difference when grouped according to years of experience, position and area of assignment. A quantitative descriptive method was employed, wherein the EPIQ (Emergency Preparedness Information Questionnaire) was used. Nurses with more than one year of experience were selected using simple random sampling. T-test and F-test were employed. Findings revealed that nurses were moderately familiar on disaster preparedness and there was a significant difference in all variables. Nurses in hospitals have more to learn on disaster preparedness. The need for continuing education is recommended. Future researches may be done on unaccounted for factors from this study like gender or type of institution using objective-type questionnaire.

**Keywords:** Hospital nurses, nurses' familiarity, disaster preparedness, disaster management, patients' safety

## Introduction

The Philippines is one of the most frequently-visited countries by various calamities such as earthquakes, volcanic eruptions, and super typhoons. Additionally, the warm ocean waters, low-lying coasts and economic instability contribute to the archipelago's difficulty in managing disasters like super typhoons

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(Vergano, D. 2013). Typhoon Haiyan killed nearly 6,300 (NDRRMC, 2013) when it hit the country, while earthquakes are equally damaging. The 1990 earthquake has the highest rate of mortality, taking 2,412 lives (PHIVOLCS, 2001). These incidents pose great responsibility in hospital institutions where victims were being brought. Hence, it is very crucial, especially for hospitals, to be familiar with disaster preparedness. According to Senate S.B. No. 2992 introduced by Sen. Legarda, healthcare institutions are vulnerable to the risks presented by hazardous phenomena. And in the health institution, there is an emphasis of conducting safety drills on a monthly basis. It is then assumed that every hospital should have at least a disaster plan in response to the guidelines for safe hospitals set by the DOH, because in a disaster, health care personnel maybe outnumbered by the injured victims (DOH, 2009). This poses a great responsibility to primary response providers especially nurses.

Since nurses are considered as front liners in disaster management at a hospital setting, they should have the knowledge on what is to prioritize during disaster, i.e., the patient's safety (Magnaye, Muñoz S., Muñoz M., Muñoz R. & Muro, 2011). They should know the scope of their responsibility and they should be able to define the significant role in preparing for, responding to, managing and recovering from disasters impacts (Magnaye, Muñoz S., Muñoz M., Muñoz R. & Muro, 2011). However, nurses lack perception regarding their role during a disaster, which interferes with effective disaster management (Rokkas, P., Cornell, V., & Steenkamp, M., 2014). In a study, nurses in hospitals have shown moderate familiarity on disaster preparedness (Baack, 2011) and neutral familiarity with emergency preparedness (Ibrahim, 2014). Additionally, hospital nurses are unlikely to familiarize themselves with disaster preparedness because disasters do not occur every day. As a result of this narrative, the necessity for nurses to be familiar with disaster preparedness is often undermined. This is supported by a study which posits that nurses are not aware of existing protocols of disaster management in the workplace, nor are they sufficiently prepared for disasters (Labrague, L., Yboa, B., McEnroe-Petitte, D., Lobrino, L., & Brennan, M., 2016).

Although there are adequate literatures delving on disaster preparedness of nurses, these are usually exclusive to nurses outside the hospital setting. Moreover, patients' safety during a disaster is significantly dependent on nurses, who are the frontliners in these events. Thus, there is supplementary need to investigate the disaster preparedness of nurses in hospitals. Moreover, hospital nurses are confronted with the demand to attend to patients injured by disasters (Chapman, K & Arbon, P.,

2008) Hence, they are expected to work together in a disaster situation despite their differences in position and lengths of experience. They are also assigned in different areas of the institution. In this case, it is then imperative to assess their familiarity on disaster preparedness. The study also aims to determine if there is a significant difference in the extent of familiarity on disaster preparedness of nurses in hospitals when grouped according to years of experience, position and area of assignment.

This study utilized Albert Bandura's Social Cognitive Theory which explains how familiarity is gained and how it develops. According to the theory, humans have the capacity for observational learning that enables them to widen their familiarity and skills rapidly through information shown by different models. The acquisition of familiarity is affected by three interrelated factors: personal, behavioral, and environmental factors (McLeod, 2011). Bandura's Social Learning theory was also used to explain a study which explored nurses' perceptions and values in best-practice guidelines and assessment. According to the study, confidence of nurses in using the validated assessment tool increased immediately after they underwent a workshop (O'Farrell, B. & Zou, G., 2008). This is supported by another study which states that axial coding of the learning strategies have concepts which are congruent to Bandura's theory on self-efficacy of modeled behaviors found in clinical practice (Vega, Al., 2007).

In this study, the personal factors pertain to the length of experience, position of nurses in the hospital and the environment of assignment. Length of experience refers to the span of time a nurse has been exposed to the clinical area. A person is able to acquire behavior when he/she is able to observe it for a period of time. Familiarity is acquired through the process of giving attention to the behavior and retaining it. In this study, the longer the experience of nurses, the more skills on disaster preparedness they have observed and, thus became familiar with. Position refers to the ranking or hierarchal status of the nurse in the hospital institution. Individuals that are observed are called models. These models provide examples of behavior to observe and imitate. In this study, nurse managers serve as models who have the ability to influence staff nurses. Due to this fact, they acquired familiarity on disaster management in order to set a good example and for the staff nurses. Environment, which is another factor in gaining familiarity, refers to the external factors that can affect a person's behavior. In this study, the area of assignment is referred to as the environment. Area of assignment is the ward where a nurse is currently assigned. The area of assignment may be a factor because hospital nurses may be assigned to wards where it is crucial to have the critical thinking skills necessary to respond to emergencies such as disasters, and are therefore obliged to be familiar with these skills. Whereas, other nurses may be assigned

to general wards which do not need as much familiarity with the skills on disaster preparedness.

## Methods and Procedures

### Design

A quantitative descriptive design was used for the study to describe the familiarity of hospital nurses on disaster preparedness and the relationship of their familiarity with variables, such as position, length of experience and area of assignment.

### Participants

Two hundred ninety one nurses from the three hospitals with the largest bed capacity in Baguio and Benguet were chosen through simple random technique. In order to get the number of staff nurses, Yamane's formula was employed, which yielded a total of 259 participants: 158 from hospital A, 65 from hospital B and 36 from hospital C. Meanwhile, enumeration was done to get the total number of 32 nurse managers from the three hospitals.

### Tool

The participants were assessed using the Emergency Preparedness Information Questionnaire with ten competency dimensions of emergency preparedness which includes the aspects, Overall Familiarity, Decontamination, Incident Command System, Ethical Issues in Triage, Disease Outbreak, Epidemiology and Surveillance, Special Population, Psychological Issues, Communication and Connectivity, and Assessing Critical Resources, by Garbutt, Peltier & Fitzpatrick (2008), with the content validity index of 0.94. The questionnaires were retrieved after an agreed upon time of completion with the respondents.

### Statistical treatment

Weighted mean was used in measuring the extent of familiarity of nurses. Unrelated t-test was utilized to measure for the significant difference on the extent of nurses' familiarity when grouped according to position and length of experience, which both compare two variables namely; staff nurse vs. nurse managers, and more than five years vs. less than five years, respectively. Meanwhile f-test was used to measure for the significant difference on the extent of nurses' familiarity when grouped according to the area of assignment, which has more than two variables namely; special care unit, non-admitting unit, critical care unit and general ward. Post hoc analysis, using Scheffe's test was utilized thereafter.

### Risk of bias in the study

This study used self-rate questionnaire in assessing nurses' familiarity on disaster preparedness, which may be susceptible to biased answers, as a result of social desirability.

**Table 1.** Extent of familiarity of nurses on disaster preparedness (N=291)

		Results	
RANK	ASPECT	X	I
1	Overall Familiarity	3.40	MF
2	Decontamination	3.32	MF
3	Incident Command System	3.30	MF
4	Ethical Issues in Triage	3.30	MF
5	Disease Outbreak	3.28	MF
6	Epidemiology and Surveillance	3.26	MF
7	Special Population	3.26	MF
8	Psychological Issues	3.20	MF
9	Communication and Connectivity	3.19	MF
10	Assessing Critical Resources	3.16	MF
<b>Overall Mean</b>		<b>3.27</b>	<b>MF</b>

#### Legend:

X-Mean I- Interpretation

#### Scale of Interpretation:

1-1.80=Low familiarity (LF)

1.81-2.60=Fair familiarity (FF)

2.61-3.40=Moderate familiarity (MF)

3.41-4.20=High familiarity (HF)

4.21-5=Very High familiarity (VHF)

Table 1 presents the familiarity of nurses on disaster preparedness in hospitals. Nurses obtained an average mean of 3.27 interpreted as moderately familiar. It also presents that the aspects nurses are most familiar with are Overall Familiarity with disaster preparedness, Decontamination, Incident Command System (ICS) and Ethical Issues in Triage consequently. The three aspects where the nurses had the least familiarity were Communication and Connectivity, Psychological Issues, and Accessing Critical Resources consequently.

Table 2 presents the familiarity of nurses according to the variables. When grouped according to position, nurse managers obtained a mean of 3.92, interpreted as highly familiar, while staff nurses obtained a mean 3.20, interpreted as moderately familiar. When grouped according to the length of experience, nurses with more than five years of experience obtained a mean of 3.49, interpreted as highly familiar, while nurses with less than five years of experience obtained a mean of 3.13, interpreted as moderately familiar. And lastly, when grouped according to the area of assignment, Special care unit obtained the highest mean of 3.55, interpreted as highly familiar, followed by Non-admitting area with the mean of 3.44, interpreted as highly familiar, then by Critical Care Unit with the mean of 3.18, interpreted as moderately familiar and by General Ward with the mean of 3.10, interpreted as moderately familiar, consequently. All variable have significant differences.

**Table 2.** General familiarity of nurses when grouped according to variables

Aspect	Staff nurse		Nurse managers		5> years		<5 years		Special Care		Non-Admitting		Critical Care		General Ward	
	X	I	X	I	X	I	X	I	X	I	X	I	X	I	X	I
<b>Overall Familiarity</b>	3.33	MF	3.96	HF	3.37	MF	3.33	MF	3.57	HF	3.72	HF	3.51	HF	3.17	MF
<b>Decontamination</b>	3.22	MF	4.23	HF	3.58	HF	3.10	MF	3.65	HF	3.55	HF	3.11	MF	3.11	MF
<b>Incident Command System</b>	3.23	MF	4.13	HF	3.79	HF	3.15	MF	3.57	HF	3.50	HF	3.21	MF	3.18	MF
<b>Ethical Issues in Triage</b>	3.24	MF	3.82	HF	3.49	HF	3.16	MF	3.55	HF	3.45	HF	3.17	MF	3.14	MF
<b>Disease Outbreak</b>	3.24	MF	3.83	HF	3.55	HF	3.12	MF	3.56	HF	3.48	HF	3.26	MF	3.10	MF
<b>Epidemiology and Surveillance</b>	3.18	MF	3.96	HF	3.48	HF	3.08	MF	3.56	HF	3.46	HF	3.18	MF	3.08	MF
<b>Special Population</b>	3.19	MF	3.91	HF	3.44	HF	3.31	MF	3.51	HF	3.34	MF	3.27	MF	3.07	MF
<b>Psychological Issues</b>	3.14	MF	3.86	HF	3.46	HF	3.0	MF	3.51	HF	3.35	MF	3.09	MF	3.04	MF
<b>Communication and Connectivity</b>	3.13	MF	3.78	HF	3.45	HF	2.97	MF	3.54	HF	3.29	MF	3.03	MF	3.06	MF
<b>Assessing Critical Resources</b>	3.10	MF	3.76	HF	3.32	MF	3.07	MF	3.48	HF	3.28	MF	2.99	MF	3.01	MF
<b>Overall Mean</b>	<b>3.20</b>	<b>MF</b>	<b>3.92</b>	<b>HF</b>	<b>3.49</b>	<b>HF</b>	<b>3.13</b>	<b>MF</b>	<b>3.55</b>	<b>HF</b>	<b>3.44</b>	<b>HF</b>	<b>3.18</b>	<b>MF</b>	<b>3.10</b>	<b>MF</b>

**Discussion**

**General Familiarity of Nurses on Disaster Preparedness**

Findings offer insights into the insufficiency of education preparation. Most nurses receive little, if any, disaster preparedness education in nursing school (Ibrahim, 2014). Consequently, they lack confidence to contribute effectively during disaster (Ibrahim, 2014). Therefore, there is a need for further research into appropriateness of education and training of nurses due to their low knowledge on disasters (Baack, 2011) and the need for nurses to be educated and to attend trainings on disaster management to prepare them for future misfortunes (Putra, Petpichetchian & Maneewat 2011). The research findings imply the need for a continuing education in hospitals and consistent drills to improve knowledge and self-efficacy for disaster management.

Given the result, the aspect, overall familiarity on disaster preparedness gained the highest mean in the familiarity scale since it covers the general familiarity in response to emergency events, such as activity in the involvement and commitment regarding disaster preparedness in the hospitals. This may be attributed to basic or general drills, which are a part of hospital protocols. This implies for the nurses' need to take initiative in familiarizing themselves with disaster management beyond the conventional protocols of the hospitals.

Assessing critical resources had the lowest mean among the ten aspects. This implies that hospitals may not have programs that would increase or that would make nurses familiar with this aspect in disaster preparedness. However, there is a need for valuable lessons on critical assessment and resources for disaster outbreak (APHN, 2013). This implies that hospital administrators must therefore update their programs on disaster management by including this aspect in their protocols.

**Familiarity of Nurses According to Variables**

*Nurse managers vs. Staff nurses*

Results reflect that administrative functions of nurse managers, such as generation of knowledge especially on clinical trends like disaster preparedness, give them the upper hand over staff nurses on disaster preparedness. Hence, they must lessen the gap between them and their subordinates through shared governance. Additionally, they must coordinate with staff nurses to empower them, especially on clinical trends like disaster management (Porter-O'Grady, 2001). The information from the experience of the nurse managers and staff nurses in their shared governance may be used to provide knowledge of empowerment for staff nurses. They are responsible for both ward management and delivery of quality clinical care to patients, as a result of the generation and dissemination of knowledge to their subordinates (Locke, Leah, Fleur & Griffith, 2011). Moreover, nurse managers

must promote an environment that minimizes work-related illness and injury (Chasedelivery (Pegram, 2014).

The outcome of the study also implies that nurse managers' hospital performance depends on the behavior they learn. One possible ground on why nurse managers are well-informed on disaster preparedness is that they, as being on the higher part of the service hierarchy, are expected to be innately familiar about it, because disasters are always anticipated to happen. With this same reason, they should also be conditioned to prepare for disastrous events. Furthermore, because of conditioning, they are able to acquire schema on disaster management. This can be explained by Watson's Behavioral Theory, which posits that emphasis must be put on external behavior of people and their reactions on given situations because it is only behavior that could be observed, recorded and measured. Nurse Managers are mostly accustomed on their administrative and budgeting roles. Hence, the need for them to go beyond what is expected from their subordinates, like familiarity disaster of preparedness that is often undermined.

The result may also be attributed to social desirability or the tendency for people to present a favorable image of themselves on questionnaires (Van de Mortel, 2008). Nurse Managers hold a position on the higher level of the administrative hierarchy in hospitals. This particular hierarchal position may also be associated with an expectation of higher level of familiarity on different trends such as disaster preparedness; thus, prompting them to answer questionnaires with bias.

Nurse managers were revealed to have the highest familiarity on decontamination. This infers that nurse managers perceive decontamination or the process of removing or neutralizing contaminants that have accumulated on personnel and equipment as critical to health and safety, especially in hospitals where hazardous waste materials can affect the vulnerable population. The result may also be attributed to the fact that decontamination protects both the health care providers and the patients by preventing and minimizing uncontrolled transportation of contaminants from one site to another. This implies that decontamination is a crucial skill in a disaster. This is further supported by the study, which also suggested that development of decontamination formulations is essential as it can help minimize or mitigate chemical, biological, radiological and nuclear disasters (Kumar, Goel, Chawla, Silambarasan, & Sharma, 2010).

Nurse managers were revealed to be least familiar with the aspect of accessing critical resources. This may be attributed to the fact that a critical resource is a resource that can only be in use, at most one process at any one time. Familiarity is least in this aspect; critical resources are only deployed during a state of national emergency. In addition to the fact that provision of these

resources, such as national stockpile, is the responsibility of the governor of each province.

Overall familiarity on disaster preparedness is highest among staff nurses. This aspect refers to the general or the basic disaster management, and as nurses being in the frontline during a disaster, entails that they need to have the basic knowledge on disaster response. This is further supported by Hynes (2006) wherein nurses must be active in interdisciplinary teams that are engaged in decision-making regarding basic emergency response. This aspect, ethical issues in triage, has the next highest mean. This may be attributed to the fact that nurses must have good assessment skills in order to make quick and critical thinking in prioritizing patients seeking for care. This is further supported by Smith & Cone (2010), wherein triage is an essential skill for nurses because it is the basis of appropriate decision in making through the process of fast initial assessment.

The aspect, accessing critical resources is the least familiar among staff nurses. This may be attributed to the same factors attributed to result of nurse managers' result regarding this aspect.

#### *More than 5 years of experience vs. Less than 5 years of experience*

Findings show that nurses with more than five years of experience are more familiar on disaster preparedness than nurses with less than five years of experience. Nurses with longer clinical experience may have developed certain techniques to perform better, thus, they are more familiar than nurses with lesser experience. Nurses with longer experience have more knowledge and have developed better techniques in duty performance compared to ones with less experience (Magnaye, Muñoz S., Muñoz M., Muñoz R., & Muro, 2011). The finding is congruent in a study wherein nurses with less than five years of experience in emergency disaster and knowledge regarding response to disaster situation, indicates inefficiency in the current system (Ibrahim, 2014). Previous experiences and trainings of nurses affect their preparedness, increase their awareness, self-confidence and skills in disaster response, and decrease their vulnerability to unpredictable events (Seyedin, Dolatabadi & Rajabifard, 2015). In another journal, adequacy of knowledge and practice, and portraying positive attitude is driven by being involved in disaster response and attending disaster-related education (Ahayalimudin, Ismail & Saiboon, 2012).

Overall familiarity on disaster preparedness is a general term, which refers to the basic knowledge on disaster preparedness. This knowledge is commonly gained in schools, as drills are

conducted in this institutions. Hence, this may be the reason why staff nurses, even if they have less than five years of experience have the highest familiarity on this aspect of disaster preparedness.

The aspect of Communication and Connectivity is least familiar among nurses with less than 5 years of experience. This implies the lack in dissemination of information regarding the agencies that need to be contacted in times of a disaster. During a disaster, it is critical that rescue workers and government officials coordinate their efforts and locate victims who may be injured or trapped through communication and connectivity. However, relief efforts can be paralyzed or severely delayed if the responding agencies are unable to communicate with one another. This is detrimental to the population, specifically to the vulnerable one.

Incident command system is highest among nurses with more than five years of experience. Nurses are already well-informed with regards to their position in the incident command system. Due to the same reason, they have already integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries.

Accessing critical resources is also revealed to be the least in terms of familiarity among nurses with more than five years of experience. This may be due to the fact that local authorities are the one who deliver these resources in their respective provinces.

#### *Area of Assignment*

The results reveal that when grouped according to the area of assignment, Special Care unit and Non-admitting unit are highly familiar on disaster preparedness, while Special Care Unit and General Ward, are moderately familiar. This may suggest that nurses in the different areas of assignment underestimate the scope of disaster preparedness and they lack acceptance on disaster management competencies. According to a study, the lack of acceptance of core competencies and the absence of disaster preparedness in nursing curricula are largely expected causes of the insufficient knowledge on disaster preparedness among nurses (Al Thobaity, Plummer, Innes, & Copnell, 2015). Nurses must be able to identify the impacts of a disaster and must be aware of the range of their responsibilities, thereby being able to deliver care even in dangerous conditions and being able to manage the consequences of such events, irrespective of their areas of assignment (Magnaye, Muñoz S., Muñoz M., Muñoz R. & Muro, 2011). At this instant, it may be suggested that it is a necessity to incorporate disaster preparedness skills into workplace.

Decontamination is the most familiar aspect among nurses in special areas. Patients in special areas are at high risk for

infections; therefore, it is imperative for nurses in this area to become familiar with the proper decontamination technique in order to reduce the contaminants to a minimum level, as this may affect the general healing process of patients.

In the Non-admitting areas, Overall familiarity to disaster preparedness obtains the highest mean in the familiarity scale. This aspect refers to the general familiarity of nurses on disaster management, which suggests that all nurses must be familiar with it to be prepared in a disaster situation. This aspect is followed by Decontamination, which refers to the process of preventing or lowering the possibility of contamination. This is mandated in every hospital, thereby making nurses familiar with this aspect. It is especially important for nurses in the non-admitting area to cut down the contaminant through the process of contamination, as their goal is to avoid longer stay of the patients in the hospital.

In the Critical Care area, Overall familiarity obtains the highest mean in the familiarity scale. Attributing factors to this may be the same as that of the non-admitting area. This aspect is followed by Special Population, which generally refers to a disadvantaged group, such as patients with disabilities (Davis, Wilson, Glove, Brock-Martin, & Svendsen, 2010). The result may be grounded on the reason that patients being taken care of in critical care area are more underprivileged than patients in the other wards.

In the General ward, the aspect, Incident Command System obtained the highest mean in the familiarity scale. Nurses recognize that it is essential for nurses to be familiar with their organizational structure in order to know what command to follow and from whom it will come. This is necessary to facilitate organized and efficient actions in a disaster situation.

In all four areas, it is revealed that nurses are least familiar with the aspect Accessing Critical Resources. This aspect refers to health insurance conditions, which are structured differently than the common hospitals, and is therefore not a part of the usual hospital protocols

#### **Conclusion**

In the light of findings of this research study, it can be validated that nurses in hospitals lack sufficient familiarity on hospital disaster preparedness, which is very necessary when a disaster occurs, given its unpredictable nature. This also confirms that hospital nurses' familiarity on disaster preparedness is crucial in preventing patient injury and promoting patient safety. The factors, position, length of experience and area of assignment influence the extent of familiarity on disaster preparedness. Hospital nurses should be given the opportunity for continuing education on emergency communication systems, technology used in disasters, psychological and sociological impact, emergency information

resources and legal and ethical principles for the special populations involved in the disaster. Moreover, updates and trainings are also recommended. Nurse Managers should possess the initiative to prioritize allocation of resources and funds disaster management trainings. Future researches can be done on unaccounted for factors from this study such as regional coverage, gender, type of institution, utilizing a quiz-type questionnaire.

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