

NURSES' PERCEIVED FAMILIARITY WITH DISASTER PREPAREDNESS

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ABSTRACT

Background: A major disaster, either natural or man-made, resulting in a large number of deaths and casualties, is hard to predict. Hence, preparing for, and responding to, a disaster is a public health priority that must be addressed, often in situations with constrained resources. The aim of this study was to assess nurses' familiarity with disaster preparedness.

Materials and Methods: A cross-sectional design was used. One hundred and thirty nurses were recruited using simple random sampling. Data was collected between December 2013 and February 2014 using a self-administered questionnaire. Pearson Chi Square analyses were used to determine the association between socio-demographic data and nurses' perceived familiarity with disaster preparedness. A p value of ≤ 0.05 was considered statistically significant.

Results: The majority of the nurses were female (80%). Less than half were from the intensive care unit (30%). More than half were unfamiliar with disaster preparedness (62.3%). Among the socio-demographic factors, nurses' workplace area was associated with perceived disaster preparedness [$\chi^2(df) = 19.41(9)$, P -value = 0.022].

Conclusion: Nurses' perceived lack of adequate disaster preparedness and the association between workplace area and familiarity with disaster preparedness highlight the need for nurse training in disaster drills and education specific to disaster preparedness management.

Keywords: Nurses, perceptions, familiarity, preparedness, disaster

1.0 Introduction

A disaster can be defined as the destructive effects of a natural event or human action that overwhelm the capacity of human and other resources to cope with its impact (Putra et al. 2011). All kinds of disasters pose a threat to human health and life, and challenge health care systems' capacity to cope with their aftermath. Large scale disasters around the world demonstrate that no country is immune to their impact (Fung et al. 2008). In Malaysia, for example, the Yellow Flood of 2014 brought the country to its knees. Other examples are the worldwide influenza HINI pandemic, which resulted in 18097 deaths in 2009 (World Health Organization, 2010), and human error, carelessness, or intentional damage such as fires, epidemics, wars, bioterrorism and bomb threats, which often turn into disasters causing loss of life and property (Rogers & Lawhorn, 2007).

During disaster events, nurses need to work under stressful conditions and are expected to be competent in delivering safe disaster nursing practice (Klein & Fowles, 2009). When disasters occur, all nurses require the relevant knowledge, skills, and competence to respond effectively and efficiently, and act as an emergency and disaster response team (Yin et al. 2011). Nurses' preparedness for disaster is essential to the delivery of adequate care to meet people's short-, medium-, and long-term health needs arising from a disaster (International Council of Nurses, 2011). In Malaysia, however, emergency and trauma nursing programs were only established in 2011. By the end of 2012, very few nurses had undertaken disaster preparedness training (Lai, 2012). Several natural and human-made disasters led health professional groups and the government to realize the need for better disaster preparedness and to respond to the need for disaster management in health care (Rahman, 2012).

While many countries globally are addressing the issue of disaster preparedness, the extent to which frontline Malaysian nurses feel prepared, or believe their institutions to be prepared, for future disasters remains unclear. Faced with many natural and man-made disasters, although not on the scale experienced in other Southeast Asian countries, Malaysia needs a health care workforce that is prepared to manage the aftermath of disaster events such as annual flooding. For example, the 2014 Yellow Flood was the most significant and largest recorded flood in the history of Kelantan on the east coast of Peninsular Malaysia. It was considered a "tsunami-like disaster", which displaced 202,000 victims (Boo, 2015). In 2015, earthquakes caused 18 deaths in Sabah (Chan, 2015). In 2013, Penang had to deal with a major building collapse (Chin et al. 2013). Major motor vehicle accidents, involving serious death, injury and other forms of trauma to multiple victims, such as a bus crash in Genting, constantly require nurses to be prepared to manage such disasters (Cheng et al. 2012).

Understanding nurses' disaster preparedness and familiarity with emergency measures is essential to minimize the health impact of disasters. Thus, the aim of this study was to assess nurses' perceived familiarity with disaster preparedness in Malaysia, with a view to adding to knowledge in this area globally.

2.0 Materials and Methods

A cross-sectional design was used in this study. Participants were recruited at one tertiary teaching hospital in the north east of Malaysia from December 2013 until February 2014.

Eligibility for inclusion were nurses with one year or more clinical experience and willing to participate in the study. A self-administered questionnaire was distributed to 130 nurses randomly selected using Microsoft Office Excel 2010 software. The sample size was calculated using Raosoft software (Raosoft, 2004), based on the assumptions that the expected proportion of preparedness for the emergency event among nurses was 0.50; there was a 95% confidence level and a 5% marginal error; and the total population of nurses in the selected wards/units/departments was 195. Ethical approvals were obtained from the Human Research Ethics Committee, USM and the hospital director. A written consent form was obtained from the study participants.

The self-administered questionnaire comprised two parts: Part A, demographic data (gender, years of clinical experience, highest level of nursing education, current practicing clinical area and experience in handling disaster); and Part B, nurses' perceived preparedness to respond to disaster using a 5-point Likert scale (unfamiliar at all, unfamiliar, neutral, familiar and very familiar). The questionnaire used in this study were adapted from Ahayalimudin et al.'s (2012), Nurul'Ain et al., (2012), Magnaye et al., (2011), Wisniewsk, Dennik-Champion, and Peltier (2004) studies with permission. A pilot study was carried out on 20 nurses to test the tool's re-test reliability before commencement of the study. The Cronbach's alpha obtained was 0.816. Some minor modifications were made to the questions to facilitate answering. Data was analyzed using SPSS 22.0. Descriptive statistics were calculated for all variables to summarize the data. Associations between the demographic characteristic and perceived familiarity with disaster preparedness were assessed using Pearson's Chi-square. The p value of ≤ 0.05 was considered statistically significant.

3.0 Results

3.1 Participants' Demographic Data

Participants' demographic characteristics (n=130) are illustrated in Table 1. The majority were female (80%), most were Malay (97.7%), the mean age was 29.0 (SD=5.1) and the mean number of years' service was 7.1 (SD=4.64). Most had Diploma level education, had heard of disaster nursing and had undertaken basic life support training within the previous five years. Seventy (53.8%) indicated that they had experience in handling a disaster event.

Table 1: Nurse participants' demographic characteristics (n=130)

Variable	Frequency	%	Mean (SD)
Gender			
Male	26	20.0	
Female	104	80.0	
Age (year)			29.0 (5.08)
≤ 25	35	26.9	
26 -30	46	35.4	
31 -35	29	22.3	
≥ 36	20	15.4	
Ethnicity			
Malay	127	97.7	

Indian	1	0.8	
Others	2	1.5	
Number of Years in Service			7.1 (4.64)
≤ 5	50	38.5	
6 – 10	45	34.6	
11 – 15	20	15.4	
≥ 16	15	11.5	
Clinical Working Area			
Accident & Emergency (A & E)	29	22.3	
Intensive Care Unit	39	30.0	
Orthopedic Ward	29	22.3	
Surgical Ward	33	25.4	
Highest Level of Nursing Education			
Diploma	108	83.1	
Diploma with Post basic	17	13.1	
Bachelor in Nursing	5	3.8	
Heard of Disaster			
Yes	104	80.0	
No	26	20.0	
Experienced in Handling Disaster Event			
Yes	70	53.8	
No	60	46.2	
Training and Education Related to Disasters Within the Past 5 years			
None	21	16.2	
Basic Life Support (BLS)	103	79.2	
Basic Trauma Life Support (BTLS)	6	4.6	

SD = Standard deviation

3.2 Associative factors of nurses' perceptions of familiarity with disaster preparedness

Table 2 illustrates the associative factors of nurses' perceptions of familiarity with disaster preparedness. More than half of the participants were unfamiliar with disaster preparedness.

Table 2: Association between nurses' demographic characteristics (gender, practice area, experienced in handling disaster) and perceived familiarity with disaster preparedness

	Perceived familiarity with disaster preparedness				χ^2 (df) ^a	P-value
	Low 60.0	< Slightly Low: 60.0 - 70.0	Moderate: 71.0 - 80.0	High > 80		
Gender						
Male	9 (34.6%)	8 (30.8%)	7 (26.9%)	2 (7.7%)	3.24 (3)	0.356
Female	42 (40.4%)	22 (21.2%)	20 (19.2%)	20 (19.2%)		

Working Department						
Accident & Emergency	5 (9.8)	5 (17.2)	10 (37.0)	9 (39.1)	18.04 (9)	0.022**
Intensive Care Unit	23 (45.1)	8 (27.6)	4 (14.8)	4 (17.4)		
Orthopedic Ward	12 (23.5)	8 (27.6)	5 (18.5)	4 (17.4)		
Surgical Ward	11(21.6)	8 (27.6)	8 (29.6)	6 (26.1)		
Experience in handling disaster event						
Yes	31 (60.8)	14 (48.3)	11 (40.7)	14 (60.9)	3.67 (3)	0.299
No	20 (39.2)	15 (51.7)	16 (59.3)	9 (39.1)		

^a Pearson chi-square, *** P -value < 0.01, ** P -value < 0.05, * P -value < 0.1.

4.0 Discussion

Like most studies involving nurses, the finding that the majority of participants were female (80%) reflects the global nature of the nursing workforce; nursing in Malaysia and elsewhere is a female dominated industry (Wolfenden, 2011). However, in contrast to Ahayalimudin et al.'s (2012) study involving 100% female nurses, having nine male nurses included in our sample offers a broader perspective on familiarity with disaster preparedness.

Despite just over half the nurses having experience in handling a disaster event, the fact that almost half had no experience and 75% perceived low familiarity with disaster preparedness indicates an urgent need for change. As the largest professional group in the health care workforce, nurses are required to be prepared to advocate for the wellbeing of disaster victims. The findings stress the need for constantly updated education and training to equip nurses with specific disaster management knowledge and skills. One way to ensure this is to establish disaster nursing as a core topic or elective subject in all nursing programs. The International Council of Nursing has suggested in its disaster nursing framework that more attention to planning and preparation is needed, including understanding of the disaster management process (International Council of Nurses, 2011). While there is a global demand for the inclusion of disaster management as a component of education programs, currently this is not the case in Malaysia. Nor does it appear to be the case in Jordan, where a study by Al Khalailah et al. (2012) showed Jordanian nurses had difficulty dealing with mass casualties.

The finding of a significant association between perceived preparedness scores and current practice area revealed that nurses working in the Accident and Emergency (A & E) Department had a much higher perceived familiarity with disaster preparedness than nurses working in other areas. This finding is possibly due to the fact that the A & E Department acts as a front door to the hospital through which many casualties have their first contact with the hospital system. Following a disaster event such as a transport incident with large numbers of casualties or a serious pandemic, significant numbers of injured or ill patients present to the A & E Department. It follows, therefore, that A & E Department nurses are on

the front line, responding daily to emergency cases and disasters, which better equips them with disaster knowledge, skills and drills (Hammad et al., 2011). This finding is in agreement with a study by Yin et al. (2011), which found that nurses stationed in the emergency department have emergency nursing skills and experience, and are more capable of handling disaster events and emergencies. Hammad et al. (2011), in their systematic literature review, found that nurses play a substantial role in the daily functioning of the A & E environment. They are involved in triaging, assessing, treating, managing and caring for casualties; their role is dynamic, changing according to the response required.

It is logical that experience in handling disaster events will improve nurses' competency and preparedness for future catastrophic events. However, the current study revealed no significant association between perceived preparedness scores and experience in handling disasters. These findings are contrary to those of Ma et al.'s (2011) study conducted with nurses in China, which indicate that nurses who have to manage or who experience disaster events are better able to cope with future disasters; they have insight into what is required and have developed mental preparedness by cultivating a positive attitude towards disaster events. Other studies focus on the importance of training all nurses in disaster drills together with educational disaster preparedness training (Ogedegbe et al., 2012). Ogedegbe et al. suggest that these drills and training can form an essential foundation of disaster management experience, beginning with dealing with an uneventful situation to build up confidence then gradually increasing the nurses' competency in handling disaster events. Mitchell et al. (2012) also underline the importance of additional efforts being made to improve future training, which should include awareness of command and control issues as well as thorough explanation of the hospital-based chain of command during the onset of a disaster. It can be concluded that experience in handling disaster events is essential in conjunction with disaster education and training.

While the outcomes of this study are limited by small sample size of nurses employed in one tertiary teaching hospital in Malaysia, and the findings cannot be generalized to all nurses in Malaysia and certainly not globally, they do stress the importance of disaster management training and education. Another limitation is that the data was not gender disaggregated, therefore the findings cannot generalize differences among gender regarding perceived preparedness for a disaster event. However, the results may serve as a guide for the Ministry of Health, Malaysia, when planning disaster preparedness training and management for nurses.

5.0 Conclusion and recommendation

While addressing disaster is a public concern, it can be concluded that nurses are not adequately prepared for disasters. The association between nurses' working department and level of familiarity towards disaster preparedness highlights the link between experience and knowledge, and the need for nurses in all departments as well as student nurses to undertake training in disaster drills and education specific to disaster preparedness management. We recommend that disaster preparedness and management be embedded in nursing programs at all levels.

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Declaration

Author(s) declare that the information above is correct and manuscript submitted by us is original. We have no conflict of interest to declare and certify that no funding has been received for the conduct of this study and/ or preparation of this manuscript.

Author(s) contribution

Author 1: Ng X.J. involved with study conception and design, acquisition of data, interpretation of data, and drafting of manuscript.

Author 2: Lim B.C. involved with interpretation of data and drafting of manuscript.

Author 3: Azlina Y. involved with drafting the manuscript and critical revision of the manuscript.

Author 4: Soon L.K. involved with study conception and design, interpretation of data, drafting the manuscript and critical revision of the manuscript.

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