Factors Affecting Nurses' Clinical Judgments Regarding Earthquake Response in a Referral Hospital, Nepal

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Abstract

The chaos during disaster may lead nurses to make poor and inappropriate clinical judgments and decisions. Limited evidence is found which has identified the interaction between variables affecting a nurse's clinical judgment in dealing with earthquake disasters, especially in Nepal. The aim of this study is to identify the predictive factors of Nepalese nurses' clinical judgments regarding earthquake response. Eighty-two nurses were purposively selected from different wards of a central referral hospital located in eastern Nepal. Data was collected using a Demographic Data Questionnaire (DDQ), a Nurses' Knowledge regarding Earthquake Disasters Questionnaire (NK-EDQ) and a Nurses' Judgment regarding Earthquake Disasters Questionnaire (NJ-EDQ). Multiple regression analysis was performed using statistical software. The results revealed that a combination of six independent variables explained a total of 42.3% of variance in clinical judgment regarding earthquake response. The nurses' knowledge concerning earthquake response and educational level had positive direct effects on nurses' judgment regarding earthquake response (p <.001). It was revealed that nurses' knowledge is important, and improvement is needed in judgment and decision-making skills. It is recommended that training should be more focused on decision-making skills based on scenarios for appropriate disaster management to enhance and facilitate appropriate judgment and decision-making skills among Nepalese nurses.

Keywords: *Disaster, judgment, nurses, earthquake, predictive factors*

Introduction

Asia has been often hit with disasters, which comprise 40.7% of all natural disasters and 90% of total global disaster victims (Guha-Sapir, Hoyois, & Below, 2014). In particular, Nepal - popularly known as a Himalayan nation - is ranked 11th in the world for earthquakes. Two big earthquakes, with magnitudes of 7.9 and 7.2 respectively on the Richter Scale in April and May 2015, killed more than 8,673 people, injured 21,594 people, and left hundreds of thousands of people homeless (United Nations High Commissioner for Refugees, 2015). In this event, all healthcare workers - including nurses - were alerted regarding their roles and responsibilities in emergency response.

Various physical and psychological health impacts crop up after an earthquake disaster (Doocy et al. , 2013; Lu-Ping et al., 2012; Tachibana et al., 2014). Nurses' skills, along with knowledge and clinical judgment, are vital to lessen these health impacts caused by an earthquake disaster. Nurses, as the largest healthcare workforce throughout the world, need to be competent in order to deal with disaster events (Wee, 2011; Yang et al., 2010). The International Council for Nurses (ICN) has alerted every nurse to have basic knowledge, skills, and judgment in order to respond effectively to disaster events (ICN, 2009).

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Problem Discussion

Appropriate skills and judgment have been considered as vital to treat victims properly, quickly, effectively and at a high medical standard when responding to disasters (Yang et al., 2010). However, the

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skills required for nurses to perform clinical procedures must be supported by knowledge and judgment

in related field (Evans & Donnelly, 2006). The ability for critical thinking is a cognitive skill which is required in order to make sound decisions and judgments in clinical practice (LaMartina & Ward-Smith, 2014). In addition, the effectiveness of clinical practice is influenced by the decisions and judgment of nurses while performing nursing care (Bjørk & Hamilton, 2011). The literature related to the judgment and decision-making ability of nurses in disaster situations is limited in nursing research. Their judgments related to emergency or mass casualty situations were reviewed.

Judgment is defined as the outcome of critical thinking and/or reasoning where nurses gather information by direct observation and patient assessment in order to make an informed clinical decision with the help of their empirical knowledge, experience, intuition, and ethical-moral beliefs (Van Graan, Williams, & Koen, 2016). The judgment and decision made in a critical situation decides the patient's outcome (Noon, 2014). Due to the chaos of mass casualty events in a disaster, this situation may lead nurses to make poor and inappropriate judgments and decisions. Nurses working in emergency departments were found to have a low accuracy of triage judgment (Chen et al., 2010).

In addition, several factors are associated with the judgment and decision-making ability of nurses in clinical practice. For example, Kilner found that nurses' triage judgment was not affected by training and education (Kilner, 2002). However, another study found that the educational level of nurses was positively associated with judgment and decision-making during medication management (Vargo, 2009). In addition, years of experience, training, and education related to triage, the level of a hospital, and the triage mode of delivery were predictive factors of triage nurses' judgment in the emergency department (Chen et al., 2010). Moreover, nurses' age, gender, years of experience, continuing education and areas of clinical practice were significant predictive factors of nurses' clinical decision making in a hospital setting (Bjørk & Hamilton, 2011). However, these factors did not clearly show in the context of disaster nursing.

Knowledge is considered a key factor in order to make appropriate clinical judgments (Evans & Donnelly, 2006), and it was found to be significantly related with triage decisions and judgment (Considine, Botti, & Thomas, 2007). These studies explored the nurses' decisions and judgment in general clinical practice and specific to triage nurses. Some factors are still inconclusive in different clinical settings.

The decisions made in emergency situations are complex and different than those required in regular clinical practice (Aliakbari et al. , 2015). Nurses working in an emergency or disaster situation have to make judgments and decisions quickly within minutes, hours, and days that are critical for successful outcomes and the overall recovery from the disaster (International Council for Nurses [ICN], 2009). Currently, there is no evidence found which has identified nurses' judgment during an earthquake disaster or what the predictive factors are, especially in Nepal, which has been frequently hit by earthquakes. It is essential to identify the selected predictive factors of nurses' judgment in emergency and disaster situations, in order to plan and facilitate appropriate judgment and decision-making skills.

Purpose

The aim of this study was to identify the predictive factors associated with nurses' clinical judgment, especially during the recent earthquake disaster response in Nepal.

Literature Review

Clinical judgment is the informed opinion that relates to the observation and assessment of patients to identify and evaluate alternative nursing options (Standing, 2014). During emergencies and disasters, where nurses are faced with a large number of injured victims, prioritization for care and treatment may be based upon physical factors rather than clinical needs (Kilner, 2002). In addition, judgment and decisions are quickly made during emergency and disaster situations. For example during triage, the decision whether to put injured victims in the red zone or yellow zone must be made within 30 seconds to 1 minute. Therefore, the judgment and decisions made in these situations may be static or dynamic, and determine patient outcomes (Noon, 2014).

A study conducted by Chen et al (2010) on the accuracy of triage judgment among triage nurses revealed that nurses had a low accuracy of triage rating accuracy. Some factors were significantly correlated with triage judgment such as the age of the nurses, years of experience as a registered nurse, and the level of the nurse on the clinical ladder. In addition, years of experience in an emergency department, hours of triage education, and triage mode of delivery were found as predictive factors which accounted for 40% of the total variance of triage judgment (Chen et al., 2010). Moreover, knowledge was found to be significantly correlated with triage decisions and judgment (Considine et al., 2007). On the contrary, Kilner (2002) found that there was no relationship between triage decision scores and experience from training and education related to triage.

Clinical decision making and judgment were found to be influenced by several factors (Bjørk & Hamilton, 2011; Considine et al., 2007; Evans & Donnelly, 2006). Age and gender of the nurses, clinical experience, field of practice, and continuing education and trainings were significantly correlated with clinical decision making among registered nurses working in a hospital setting in Norway. Furthermore, the combination of these variables explained a total of 38% of variance in clinical decision making among Norwegian nurses. In addition, knowledge of nurses in related fields also determines decision making and clinical judgment. The educational level of nurses was also found to be positively associated with judgment and decision making during medication management (Vargo, 2009).

From the above literature, it has been found that most of the studies were conducted in clinical settings rather than disaster situations where nurses have limited resources to make judgments and decisions. Thus, this study was intended to discover the most significant factors affecting nurses' judgment during disaster situations in order to prepare Nepalese nurses for future disasters with appropriate decision making and judgment abilities.

Conceptual Framework

Based on the ICN disaster nursing framework (ICN, 2009) and the literature review, clinical judgment competency is one of the most important components in disaster response. Nurses' judgment abilities are crucial in a disaster response phase where they have to make quick judgments and decisions (Good, 2008; Sandman & Nordmark, 2006). In this study, the clinical judgment of nurses regarding earthquake disasters consists of decision making related to the care of the community, the care of individuals and families, psychological care, and care for a vulnerable population.

Methodology

A cross-sectional study was conducted among nurses working in different clinical settings in one of the central hospitals located in eastern Nepal. This hospital is a teaching hospital and is the highest level of referral hospital in eastern Nepal with a capacity of 750 beds. Thorndike's formula was used to calculate the sample size (Polit &Beck, 2012). One hundred and ten nurses were initially

approached who had at least 3 years of diploma level of education in general nursing, were currently working in a hospital setting, and were willing to participate in the study.

Ethics

The study was approved by the Institutional Review Board of the Faculty of Nursing, Prince of Songkla University, Thailand, the Nepal Health Research Council (NHRC), Nepal, and the Institutional Review Committee of the hospital. Written informed consent was taken after the explanation of the study objective was given to the nurses. The information collected was kept confidential, and the researcher maintained anonymity using a code in each questionnaire.

Research Instruments

The tool was a self-reported questionnaire developed by the investigator, based on the International Council for Nurses (ICN) disaster nursing framework and a relevant literature review. It was comprised of three parts. The first part included nurses' demographic characteristics or a Demographic Data Questionnaire (DDQ), which consisted of age, educational level, previous experience, training, and experience related to the disaster. The second part was a Nurses' Knowledge regarding Earthquake Disasters Questionnaire (NK-EDQ) composed of 24 T/F items with the score of 0 given for an incorrect and 1 for a correct answer. The third part contained a Nurses' Clinical Judgments regarding Earthquake Disasters Questionnaire (NJ-EDQ) with 10 disaster situation scenario–based items in the response and recovery phases. In the response phase, there are four domains: 1) care of community (2 items); 2) care of individual and families (3 items); 3) psychological care (2 items); and 4) care of vulnerable population (1 item). The recovery phase is composed of one domain: long-term individual, family, and community recovery (2 items). The multiple choice format was used to ask the appropriate response that the participants thought they would do in the situation (scenario). Each correct answer was given a score of 1 and incorrect answer received a score of 0.

Three experts in disaster and surgical nursing were asked to validate the content of the instrument: two academic lecturers from Thai universities, and the other from a general public hospital in Nepal. Both tools (NJ-EDQ and NK-EDQ) were tested for internal consistency reliability with 20 participants who were not part of the final study using the Kruder-Richardson formula (KR-20), which yielded coefficients of .79 and .74 respectively.

Data Collection

Data was collected in April 2016. After obtaining permission from the hospital ethics board, the researcher contacted the hospital nursing director for formal permission to collect the data. The head nurses of six wards (emergency, medical, surgical, critical care unit, obstetrics and gynecology, and pediatric ward) were approached and asked for a list of names of the nurses working in each ward. The participants were purposively selected based on the inclusion criteria until the researcher reached the target number. Participants were given 2 days to 1 week to complete and return the questionnaires. Follow up phone calls were made in the case of no response for a week. A total of 110 Registered Nurses (RNs) were approached for study participation; 88 RNs returned the questionnaires, yielding an 80% response rate. Incomplete questionnaires were excluded (*n*= 6); finally, 82 questionnaires were used for data analysis.

Table 1. Predictors of Nepalese Nurses' Clinical Judgment regarding Earthquake Response

Variables	R	R²	Adjusted R²	R² Change	F	p
1. Previous experience in disaster care	0.094	0.009	0.004	0.009	0.72	0.40
2. Previous experience in disaster care, previous training and education related to disaster	0.166	0.027	0.003	0.019	1.51	0.22
3. Previous experience in disaster care, previous training and education related to disaster, experience as a registered nurse	0.275	0.076	0.40	0.048	4.07	0.04
4. Previous experience in disaster care, previous training and education related to disaster, experience as a registered nurse, educational level of RNs	0.461	0.212	0.172	0.137	13.37	0.00
5. Previous experience in disaster care, previous training and education related to disaster, experience as a registered nurse, educational level of RNs, age of RNs	0.483	0.233	0.183	0.021	2.04	0.16
6. Previous experience in disaster care, previous training and education related to disaster, experience as a registered nurse, educational level of RNs, age of RNs, knowledge regarding earthquake response	0.650	0.423	0.377	0.190	24.69	0.00

Table 2 Each Predictor of Nepalese Nurses' Clinical Judgment regarding Earthquake Response

Predictors	b	β	t	p
1. Having previous experience in disaster care	0.21	0.05	0.51	0.6
2. Having previous training and education related to disaster	0.76	0.16	1.73	0.08
3. Experience as a nurse	0.14	0.31	1.48	0.14
4. Educational level of nurses	1.39	0.32	3.36	0.00
5. Age of nurses	0.12	0.29	1.36	0.18
6. Knowledge regarding earthquake response	0.26	0.46	4.97	0.00

Data Analysis

Demographic data were analyzed using descriptive statistics. Multiple regression analysis was performed for predicting the factors of nurses' judgment after the assumptions of normality, linear relationship, and homoscedasticity were met. The level of significance (α) less than 0.05 was considered statistically significant.

Results

Demographic Data

The nurses in this study were aged between 20 to 40 years (*M* = 25.82, *SD* = 4.59). The majority of the nurses (74.4%) had a diploma degree and 69.5 % of the nurses had less than 6 years of working experience (*M* = 4.11, *SD*= 3.86). Eighty-two percent of the nurses did not have any training or education related to any kind of disasters, and only 18% of the nurses had direct experience in disaster care during the last five years.

Predictors of Nurses' Clinical Judgment in Earthquake Response

At first, six blocks of variables were entered into the regression model. The first and second block consisted of having previous experience, as well as previous training and education respectively, related to disasters. The third block consisted of years of experience as a nurse, and the fourth and fifth blocks contained the educational level and age of the nurses. Finally, the last or sixth block, consisted of having adequate knowledge regarding earthquake response.

A summary of the findings of the multiple regression models is shown in Table 1, which explains that the total R^2 accounted by having previous experience in disaster care in block 1 was only 0.9%. The addition of having previous training and education related to disasters to the model in block 2 increased the variance explained in nurses' judgment by 1.8% with a total R^2 of 2.7%. Further addition of the years of experience as a nurse in the model increased the variance by 4.9%, increasing the total variance to 7.6%. The addition of the nurses' educational level increased the variance of nurses' judgment up to 21.2%, a difference of 13.6%. The fifth block was added with the age of the nurses, which increased the change of variance explained in nurses' judgment by 2.1%. Finally, having knowledge regarding earthquake response increased the variance of nurses' judgment by 19 %. The combination of all independent variables explains a total of 42.3 % of variance in clinical judgment regarding earthquake response. In addition, the nurses' knowledge in earthquake response and having a higher level of education were significant predictors of nurses' clinical judgment regarding earthquake response. The detailed figures are shown in Table 2.

As shown in Table 3, further analysis was done by entering the two blocks of variables which were the significant predictors of nurses' judgment. The knowledge of nurses regarding earthquake response alone and educational level of the nurses alone could explain 25.9 % and 11.4 % variance in nurses' judgment respectively. Moreover, the combination of these two independent variables explains the total 37.3 % of variance in clinical judgment regarding earthquake response.

Table 3 Significant Predictors of Nepalese Nurses' Clinical Judgment regarding Earthquake Response

Significant Predictors	R	R^2	Adjusted R^2	R^2 Change	F	p
1. Knowledge regarding earthquake response	0.509	0.259	0.250	0.259	28.003	0.00
2. Knowledge regarding earthquake response and educational level of nurses	0.611	0.373	0.357	0.114	14.316	0.00

Discussion

The findings of the study revealed that a higher educational level and knowledge related to earthquake response were significant predictive factors of nurses' clinical judgments in earthquake disaster response. These two variables explain a total of 37.3% of variance in clinical judgments regarding earthquake response. Several factors might have influenced the findings of this study, which are discussed as follows.

Firstly, knowledge forms a basis for human judgment and decision making (Evans & Donnelly, 2006; Gunnarsson & Warrén Stomberg, 2009; Phaneuf, 2008). This means that nurses need adequate knowledge in the area of disaster nursing in order to make correct judgments in nursing practice. In addition, being an expert and having good assessment skills were important factors associated with triage judgment and decisions (Morteza et al., 2014). The finding is consistent with the previous study in which higher levels of factual knowledge were found to enable better triage decisions (Considine et al., 2007).

Secondly, nurses' educational levels were found to be significant predictors of their judgment in earthquake response. Educational level can influence judgment and decision- making abilities among nurses in clinical settings (Bakr et al., 2013; Vargo, 2009). In addition, studies have found that nursing competence, clinical judgment, and critical thinking abilities of nurses with a higher degree were better than those with a Bachelor's or diploma level of education (Chang et al., 2011; Shin et al. , 2006; Vargo, 2009). Therefore, having a higher level of education can help nurses to develop sufficient skills to seek information and gain insights related to appropriate judgment and decisions. This finding is in accordance with a previous study where further education was a significant predictor of Norwegian nurses' clinical decision making in hospital settings (Bjørk & Hamilton, 2011). This finding also supports the idea that higher educational levels help guide Nepalese nurses towards better clinical judgments.

Age and previous work experience of the nurses were not significant predictors of nurses' judgments in an earthquake response. Studies have found that nurses with higher clinical experience felt that they were more confident in making clinical judgments (Gunnarsson & Warrén Stomberg, 2009; Jahanpour et al., 2010). The nurses in this study were mostly young (85%) and had been working less than 6 years. So, the lower age and less experience of the nurses might have influenced the non-significant findings of this study. However, Bakr et al found that years of experience and an older age of nurses were significant predictors of nurses' decision making in a hospital setting (Bakr et al., 2013). This contrast in findings may be partly due to the different ages and experiences of the participants, as well as the study situation occurring in daily clinical practice, whereas the current study includes the judgments and decisions made in a disaster situation.

The other two variables - previous disaster experience and previous disaster training and education - were not found to be significant predictors of nurses' judgment. These findings may be because the majority of the respondents in this study did not have any experience in disaster training or direct experience in disaster care. In addition, the existing training course was mainly directed to improve technical skills rather than judgment skills. The finding is consistent with a previous study in that training and education were not significantly associated with triage judgment (Kilner, 2002). However, it may be in contrast to previous studies which have found that experience and training can help nurses gain insight, absorb information from others, and learn from mistakes and repeated action in similar situations. This may increase the knowledge and skills of nurses in order for them to make appropriate judgments and decisions (Chapman & Arbon, 2008; Hammad et al., 2012; Hermawati, 2010; Husna, 2010; Phaneuf, 2008). The inconsistent findings may be related to the different instrument used and the context of the disaster experience.

Limitations

The sample of this study was nurses from one hospital; thus, the findings may not be generalizable to measure Nepalese nurses in all areas. In addition, this study used a cross- sectional design, which does not allow the inference of causality. Finally, using a self-administered questionnaire could have limited the measurement of nurses' actual judgment performance.

Conclusion and Recommendations

The findings reveal that the combination of all independent variables (previous training and experience concerning disasters, age and educational level of nurses, previous work experience) explained a total of 42.3% of variance in clinical judgments in earthquake response. However, knowledge related to earthquake response and the educational level of nurses in particular were the most significant predictors, explaining a total of 37.3 % of variance in clinical judgments regarding earthquake response. The findings may suggest that nurses could have a better level of judgment through improving knowledge and supporting continuing education. Educational packages should be developed using more scenarios and simulation in order to upgrade nurses' knowledge to enhance and facilitate appropriate judgments and decision-making skills.

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