Clinical Skills for Tsunami Care and Its Relating Factors Perceived by Nurses in Indonesia

Cut Husna, RN1, Asst. Prof. Dr. Urai Hatthakit, RN2, Assoc. Prof. Dr. Aranya Chaowalit, PhD., APN3

1. Master Student in Adult Nursing, Faculty of Nursing, Prince of Songkla University, Hatyai, Songkhla, Thailand
2. Department of administration, Faculty of Nursing Prince of Songkla University Hat Yai, Songkhla, Thailand
3. Department of administration, Faculty of Nursing Prince of Songkla University Hat Yai, Songkhla, Thailand

Abstract

Nurses need to be equipped with appropriate disaster nursing skills and disaster management in response to disaster occurrence. The 2004 tsunami is a gigantic disaster that has tested the skills and response of the nurses involved in the care of the tsunami patients. This descriptive correlational study was conducted to describe the level of clinical skills for tsunami care, and to examine the relationship between knowledge, training and education, working experience, attending hospital disaster drills, and clinical skills for tsunami care perceived by nurses in Indonesia. This study utilized systematic random sampling involving 97 nurses in a hospital in Banda Aceh, Indonesia. Data were collected by questionnaires, which consist of five parts, namely; demographic data, nurses’ clinical experience, nurses’ knowledge in tsunami, and nurses’ clinical skills in tsunami. Pearson’s product moment correlation was used to investigate the relationship between clinical skills for tsunami care and knowledge, working experience, and training and education. Chi square was used to examine the relationship between clinical skills for tsunami care and attending hospital disaster drill. Knowledge, working experience, and training and education were statistically low significant correlated with clinical skills for tsunami care ($r = .24, p< .05$), ($r = .30, p< .01$), ($r = .23, p< .05$) respectively. In contrast, attending hospital disaster drill had no correlation with nurses’ clinical skills ($\chi^2 = .82$, p>. 05). The study revealed that nurses in the hospital have to improve their knowledge and skills in order to respond to disasters. Keywords: Nurse, Clinical skills, Perceived, Tsunami, Hospital

Background and Significance of the Problem

The earthquake and tsunami on December 26, 2004 had killed more than 270,000 people in 11 countries, injured 500,000, and has affected approximately five million people in the world. The hardest hit was observed in Aceh province, Indonesia causing the death of an estimated 128,000 inhabitants. This death toll is about a quarter of its total population.
Moreover, countless of people were injured and most had lost their homes (World Health Organization, 2005).

The 2004 tsunami disaster had caused varying degrees of physical trauma on the affected population such as; lung injury, head injury, fracture, wounds, water borne diseases, and insect transmitted diseases. Maegele et al. stated that two-thirds of tsunami patients were reported to have combined injuries to the thorax or fractures. Patients who survived from drowning suffered aspiration of immersion fluids, marine and soil debris into the respiratory tract. Veenema (2007) mentioned that tsunami has also a long lasting impact on psychological, psychosocial, and spiritual problems of the affected patients. Disruptions due to tsunami caused anxiety, family dysfunction, posttraumatic stress disorder (PTSD), conductive disorders, addictive behaviors, severe depression, panic, dissociation, grief reaction, increase stress level, sleep disruption, and even suicidal attempt.

Nurses must be equipped to provide disaster response, communicate with disaster command, and evacuate patients during the tsunami disaster. Many cases indicated inadequate nursing care, medical care, poor communication, chaotic management, and meager patient evacuation (Collander et al., 2007). In enhancing the capability to respond to disaster and other public health emergencies, it requires a nursing work force, which is clinically rich in skills and experiences. In addition, nurses should have sufficient knowledge and skills to respond to tsunami disaster with confidence and authority (Veenema, 2006).

Nurses are expected to have sufficient knowledge and skills for tsunami care patients. However, several studies showed that ineffective medical response and lack of nurses’ clinical skills resulted in inadequate nursing care of tsunami patients. Watcharong, Chuckpaiwong, and Mahaisavariya (2005) found that several problems arose in the care of trauma patients. The available medical personnel were inefficient in skills, equipment handling, and surgical facilities to deal with the huge number of patients effectively. The failure of the communication system, the ineffective rescue facilities in the hospitals also hindered in the care of traumatic for tsunami patients. The nurses have to furnish sufficient clinical skills for tsunami care patients.

Objectives

The objectives of this study were as follows: 1) to identify the level of clinical skills for tsunami care, 2) to determine the relationship between clinical skills for tsunami care and its relating factors perceived by nurses in Indonesia.
Technical Terms

*The clinical skills for tsunami care* refers to the perceived ability of the nurses to practice relevant skills including triage, acute respiratory care, wound care, mental health care, psychosocial care, spiritual care, and patient referring. *The relating factors perceived by nurses* refer to factors related to clinical skills for tsunami care including knowledge, training and education, working experience, and attending hospital disaster drill.

*Knowledge* refers to the nurses’ understanding of impact of the tsunami including physical, psychological, psychosocial, and spiritual impacts on response phase, and disaster management. *Training and education* refers to the number and time the nurses attended in emergency training and educational program. Moreover, *working experience* refers to the nurses’ perception on specific nursing activities performed in caring for tsunami patients. Lastly, *attending hospital disaster drill* refers to the number of times the nurses had attended the hospital disaster drill.

Framework of the Study

The clinical skills for tsunami care perceived by nurses focused on the response phase of disaster management. Disaster management was adopted from Kim and Proctor (2002, as cited in Qureshi & Gebby, 2007), consisting of five basic phases which include preparedness, mitigation, response, recovery, and evaluation. The conceptual framework of nurses’ clinical skills in this study were adopted from the concept of competencies of the nurses on disaster management from International Nursing Coalition for Mass Casualty Education [INCMCE] (2003), the College of Register Nurses of Nova Scotia [CRNNS] (2006), and a study from Kaewlai et al. (2009). Based on an intensive review of the concepts and empirical studies, the researcher concluded that clinical skills for tsunami care were relevant as follows; (1) triage, (2) acute respiratory care, (3) wound care, (4) mental health care, (5) psychosocial care, (6) spiritual care, and (7) patient referring.

In this study, the researcher focused only on the related factors to improve clinical skills for tsunami care. These factors were adopted from several literature including knowledge (Considine, Botti, & Thomas, 2007; Sausa, 2006), training and education (Jensen et al., 2008), working experiences (Bjork & Kirkevold, 1999; Chapman & Arbon, 2008; Considine et al., 2007; Jensen et al., 2008), and attending hospital disaster drill (Green, Modi, Lunney, & Thomas, 2003; Kaji & Lewis, 2008; Sweeney, Jasper, & Gates, 2004; Vinson, 2007) (See Figure 1).
Research Methodology

This study was a descriptive correlational study. The target population of the study was the nurses who worked in acute care, and emergency and critical care setting from a provincial hospital in Banda Aceh, Indonesia. The total sample size was 97 subjects. The sample was recruited by using systematic random sampling. The sample was selected from representative wards of each setting. The nurses who met the following inclusion criteria were recruited: 1) had been working permanently and a contracted employee in the hospital, 2) had working experience of at least a year in the hospital.

The instrument consisted of four main parts, 1) Demographic Data Questionnaire (DDQ), 2) Nurses’ Clinical Experience Questionnaire (NCEQ), 3) Nurses’ Knowledge in Tsunami Questionnaire (NKTQ), and 4) Clinical Skills for Tsunami Care Questionnaire (CSTCQ). The DDQ and NKTQ were developed by the researcher. Moreover, NCEQ and CSTCQ were developed by the researcher and colleagues (Husna & Hermawati, 2009). The DDQ consisted of age, gender, marital status, religion, educational background, training and education, working experience, and attending hospital disaster drill. The NCEQ was measured by using the four point Likерт-like scales, and CSTCQ was utilized by using the five point Likert-like scales. Moreover, the NKTQ was responded with a multiple-choice. For interpretation, the clinical skills for tsunami care perceived by nurses were categorized into three levels as follows: low = 1.0 - 2.3, moderate = 2.4 - 3.7, and high = 3.8 - 5.0.

Factors Related to Clinical Skills for Tsunami Care:
1. Knowledge
2. Training and education
3. Working experience
4. Attending hospital disaster drill

Clinical Skills for Tsunami Care Perceived by Nurses:
1. Triage
2. Acute respiratory care
3. Wound care
4. Mental health care
5. Psychosocial care
6. Spiritual care
7. Patient referring

Figure 1: Conceptual framework of clinical skills for tsunami care and its relating factors perceived by nurses

![Conceptual framework of clinical skills for tsunami care and its relating factors perceived by nurses](image-url)
The three experts from the Faculty of Nursing, Prince of Songkla University validated the content of the instruments. The NCEQ and CSTCQ were tested for internal consistency using Cronbach’s alpha coefficients with the score of .93 and .98 respectively. Moreover, NKTQ and attending disaster drill questionnaires were tested for stability using Kuder Richardson-20 with the score of .71 and .96 respectively. Lastly, the training and education variables were tested for stability using Spearman’ Rho ($\rho = .98$, $p<.01$) is reached. The reliability tests were performed with 20 subjects who had similar criteria to the study subjects.

The research approval was obtained from the Institutional Review Board (IRB) of Faculty of Nursing, Prince of Songkla University, Thailand. The subjects who agree voluntary to participate in this study were informed about their right. The researcher explained the purpose of the study, expectations from the subjects’ participation and potential harms such as the emotional trauma of remembering the tragedy, sadness, depression, or despair before the conduct of the instruments. No subjects manifested psychological problems upon completion of the questionnaires. The researcher maintained anonymity of the subjects by using code and all personal information was kept confidential. Data collection was conducted from October to December 2009.

**Results**

The sample consisted of 97 nurses with the mean age of 31.9 (SD = 6.6). Most of them were more than 30 years old (56.7%) with the mean score of 31.9 (SD = 6.6), and married (75.3%). The great majority of the subjects were female (71.1%), all of them were Muslim (100%), and diploma level (78.4%). Attending emergency training and education had 6 index scores (37.1%) with the mean index score of 4.3 (SD = 1.9). Working experience as a nurse was <5 years (46.4%) with the mean score of 8.7 (SD = 7.5). The great majority of the subjects had experience in caring for tsunami patients (80.4%), and their experience in caring for tsunami patients for 3 months in average. Approximately 42.3% of the subjects had attended in hospital disaster drill with the mean score of 0.4 (SD = 0.5).

The related factors of clinical skills for tsunami care showed that knowledge had the mean score of 0.7 (SD = 0.1) and working experience of 2.1 (SD = 0.6). Moreover, training and education was computed using index score with the mean scores of 4.3 (SD = 1.9), and attending hospital disaster drill was measured using dichotomous choice with the mean score of 0.4 (SD = 0.5).
The level of clinical skills for tsunami care of the subjects is presented in table 1. Overall, the clinical skills for tsunami care were at a moderate level with the total mean score of 3.5 (SD = 0.9).

Table 1
Means, Standard Deviations, and the Levels of Nurses’ Clinical Skills of the Subjects (N = 97)

<table>
<thead>
<tr>
<th>Nurses’ clinical skills</th>
<th>M</th>
<th>SD</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Triage</td>
<td>3.7</td>
<td>0.8</td>
<td>Moderate</td>
</tr>
<tr>
<td>2. Acute respiratory care</td>
<td>3.6</td>
<td>0.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>3. Spiritual care</td>
<td>3.5</td>
<td>0.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>4. Mental health care</td>
<td>3.5</td>
<td>0.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>5. Wound care</td>
<td>3.5</td>
<td>0.9</td>
<td>Moderate</td>
</tr>
<tr>
<td>6. Patient referring</td>
<td>3.4</td>
<td>0.8</td>
<td>Moderate</td>
</tr>
<tr>
<td>7. Psychosocial care</td>
<td>3.4</td>
<td>0.8</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3.5</td>
<td>0.9</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

The relationship between nurses’ clinical skills and its related factors is presented in table 2. The knowledge and working experience were statistically significant low positive correlated with nurses’ clinical skills (r = .24, p< .05), and (r = .30, p< .01) respectively. Training and education was statistically significant low positive correlated with nurses’ clinical skills (r = .23, p<.05) except for wound care. Moreover, attending hospital disaster drill was analyzed by using Chi-square. The result showed that there was statistically non-significant correlated between attending hospital disaster drill and clinical skills for tsunami care perceived by nurses (χ² = .82, p> .05).

Table 2
Correlations between Nurses’ Clinical Skills and Its Relating Factors (N = 97)

<table>
<thead>
<tr>
<th>Relating factors</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge</td>
<td>.24*</td>
<td>.20*</td>
<td>.23*</td>
<td>.26*</td>
<td>.24*</td>
<td>.21*</td>
<td>.26*</td>
<td>.24*</td>
</tr>
<tr>
<td>2. Working experience</td>
<td>.31**</td>
<td>.30**</td>
<td>.29**</td>
<td>.30**</td>
<td>.28**</td>
<td>.27**</td>
<td>.28**</td>
<td>.30**</td>
</tr>
<tr>
<td>3. Training and education</td>
<td>.21*</td>
<td>.23*</td>
<td>.21*</td>
<td>.21*</td>
<td>.20</td>
<td>.27**</td>
<td>.26*</td>
<td>.23*</td>
</tr>
<tr>
<td>4. Attending hospital drill</td>
<td>.73</td>
<td>.29</td>
<td>.30</td>
<td>.47</td>
<td>.22</td>
<td>.44</td>
<td>.16</td>
<td>.82*</td>
</tr>
</tbody>
</table>

*p<.05  **p<.01, a: Chi square correlation (Fixer’s exact test)

Note: 1 = Triage, 2 = Acute respiratory care, 3 = Spiritual care, 4 = Mental health care, 5 = Wound care, 6 = Patient referring, 7 = Psychosocial care
Discussions

Overall, the levels of clinical skills for tsunami care were at a moderate level. Demographic characteristics of the subjects played an important role on this moderate level. The majority of the subjects (78.4%) were diploma level. The finding also showed that the mean score of nurses’ knowledge in tsunami was 0.7 (SD = 0.1). It can be interpreted that the nurses’ knowledge in caring for tsunami patients are insufficient. The subjects who have formal education at the diploma level might not have enough mastery knowledge in preparing their skills in tsunami response. Existing study found that knowledge is acquired through formal and informal study in conjunction with experience in a specific domain of nursing practice. The level of education is commonly used as a major influence in clinical care (Considine et al., 2007). A recent study found that nurses who have diploma level education showed lower knowledge and skill than baccalaureate, master or doctoral students on clinical management system (Chan, 2009).

Age could contribute to the explanation of this study finding as well. The greater numbers of the subjects (56.7%) were more than 30 years old and the rest of them less than 30 years old (43.3%). Almost half of them were young adults who have not yet accumulated their knowledge structure in maintaining adult cognition. In responding to nursing care for tsunami patients, it is necessary to possess sufficient knowledge and skills to perform specific and advanced nursing clinical skills. Consistently, the previous studies by Marsiske and Willis (1995, as cited in Kliegel & Martin, 2007) revealed that adult age could influence problem solving, explicitly emphasize experience and accumulated knowledge structure in maintaining adults cognition. In addition, Chan (2009) found that young adults age (26-30 years) had lower knowledge and skill levels than middle adults age (31-40 years) on clinical management system.

Working experience might contribute the clinical skills for tsunami care at a moderate level. The finding of this study showed that most of them had working experience as a nurse less than 5 years were 46.4 percent. In addition, the majority of the subjects had direct experience in caring for tsunami patients in acute response phase were 80.4 percent for three months in average, because at that time they were already working as a nurse in acute care, emergency, and critical care setting. It was indicated that most of the subjects are limited in duration of direct clinical experience in caring for tsunami patients in acute and emergency response phases. The previous study was in accordance with the finding of this study which mentioned that the nurses had working experience <5 years showed lower of
knowledge and skill than who had experience >10 years on clinical management system (Chan, 2009). Bjork and Kirkevold (1999) which found most of the nurses who have worked for many years and long periods of practices have high expectations of efficiency and mastery while performing the nursing practice.

Training and education might also contribute to at a moderate level of clinical skills for tsunami care. The findings of this study showed that the subjects who attended in training disaster management for two times were 16.4 percent, once 61.8 percent and never trained were 21.6 percent. In addition, attending training and education showed that 37.1 percent of the subjects had six index score with the mean score of 4.3 (SD = 1.9). The six index score of trainings were BLS, ACLS, BTLS, disaster management, infection control and prevention, and mental health care for tsunami survivors training. It can be learned that training on disaster management for tsunami care was insufficient. Gould, Berridge, and Kelly (2007) suggested that emergency training and education should be continued to enable the nurses to develop and apply knowledge and skills to meet demands of their current roles and functions needed for disaster response.

Lastly, attending hospital disaster drill might contribute to the result findings. In fact, within five years after the tsunami struck, the hospital had offered only once for drill that supported by local government and NGOs. The subjects who attended in hospital disaster drill were 42.3 percent with the mean score of 0.4 (SD = 0.5). It was indicated the hospital discontinue to conducting to hospital disaster drill. The previous study mentioned that is required to conduct at least once a year for drill in hospital that involves enough victims to test the organization’s performance under stress. As a standard, the hospital must provide for hospital disaster drill regularly to evaluate nurses’ competency to response to disaster (Kaji & Lewis, 2008).

The statistical finding showed that knowledge was significantly low positive correlated with clinical skills for tsunami care (r = .24, p< .05). Knowledge might influence development intellectual skills. It was interpreted sufficient knowledge leading to sufficient skills to performing nursing clinical skills in response to disaster. Otherwise, several studies reported that lack of knowledge in tsunami might contribute to lack of clinical skills for tsunami care.

Consistently, the previous study by Lukthitikul and Hatthakit (2007) which mentioned that the nurses lack knowledge to provide care to the tsunami patients with having wounds, showed lack of skills while cleaning and suturing the wounds. These results were wounds...
inflammation and infection due to the penetration of the debris, sand, and mud in the tissues. Moreover, Watcharong et al. (2005) found that several problems arose in caring for tsunami wound particularly lack of knowledge about specific tsunami wound care leading to inefficient to performing clinical skills of wounds. As a result, almost all the patients having wound and open fracture are treated late and become infected with various kinds of infections.

Working experience was statistically significant low positive correlated with clinical skills for tsunami care ($r = .30$, $p< .01$). The experience is a factor determining transform or change nurses’ knowledge and skill (Jensen et al., 2008). The study was supported from previous study which found that the nurses displayed good capability in clinical skills who were selected for experience or training in disaster management and previous experiences in disaster response (Arbon et al., 2006). Chapman and Arbon (2008) mentioned that gaining skills as criteria for experience supports, the fact that there is a complex relationship between skills and experience. Considine et al. (2007) pointed out that experience in terms of exposure to events is also an important source of skills in nursing and in clinical decision-making.

In addition, training and education was significantly correlated with clinical skills for tsunami care ($r = .23$, $p< .05$) except for wound care. Training and education are essential part to improve skills for nurses while handling disaster response. Skills of nurses are related to training and level of educational institution received by the nurses and well reflected while handling the disaster response (Gould et al., 2007).

Relevantly, the previous studies by Doyle, Gallagher, Bell, Rochford, and Roynane (2008) explained that training and education could evaluate knowledge, skills, and attitudes to perform the skill or competency. Skill in training could assess the ability of others in the nurses’ skill or competency. Jensen et al. (2008) mentioned that training program would be increasing knowledge and skills when contents, methods, and strategies fit for characteristics of participants. Moreover, the existing study pointed out disaster mental health intervention during and following the disaster had provided many disaster mental health skills and had been valuable in professional and personal lives (Reid et al., 2005). Williams, Nocera, and Casteel (2008) reported that training interventions for health care providers are effective for improving knowledge and skills in disaster response.

In contrast, hospital disaster drill was statistically non-significant correlated with clinical skills for tsunami care ($\chi^2 = .82$, $p> .05$). The hospital disaster drill is an essential part for improvement and evaluation of disaster response capacity for health care provider
including nurses in the hospital. There are several reasons might contribute for non-significant correlation of the results. The limited funding support, lack of hospital policy, and suboptimal to validate drill tool assessment could be an indicated. The previous studies mentioned that drills can be difficult to organize and expensive because overtime pay could be necessary to compensate participants, and on-duty staff may have to defer the performance of their regular daily duties to participate in the disaster drill (Kaji & Lewis, 2008).

The study was supported by evidence from previous study, which mentioned that the lack of validated assessment methods might reflect the complex problem of hospital drill preparedness. The weakness in hospital disaster management includes confusion over roles and responsibilities, poor communication, lack of planning, suboptimal training, and lack of hospital integration into community disaster planning are demonstrated in disaster management (Kaji, Langford, & Lewis, 2008).

Conclusions and Recommendations

In summary, clinical skills for tsunami care in triage, acute respiratory care, spiritual care, mental health care, wound care, patient referring, and psychosocial care were at a moderate level. The clinical skills for tsunami care were statistically significant low positive correlated with its related factors including knowledge, working experience, and training and education, except for attending hospital disaster drill. Demographic data might contribute to clinical skills for tsunami care including diploma level, age, and working experience as a nurse, and direct clinical experience for tsunami care. These factors have played an important role to improve clinical skills for tsunami care.

The clinical practitioners and hospital policy makers should be aware on the importance of hospital disaster drill in response to the tsunami. The policy makers in the hospital must have an effective networking with the emergency training center to provide emergency trainings and educational programs and hospital disaster drills regularly. The hospital should also allocate funding for hospital disaster plan in response to hospital disaster drills, emergency trainings and education, and validated assessment tool for drill regularly.

Lastly, the clinical practitioners should encourage the nurses to increase their knowledge for tsunami care by attending emergency trainings and education, and hospital disaster drill regularly. Developed guideline study should be considered and conducted to prepare information about clinical skills for tsunami care and its related factors for patients exposed by disaster.
References


Considine, J., Botti, M., & Thomas, S. (2007). Do knowledge and experience have specific roles in triage decision-making. Academic emergency Medicine, 14, 722-726.


