Nurse Media
JOURNAL OF NURSING

EMERGENCY TRAINING, EDUCATION AND PERCEIVED CLINICAL SKILLS FOR TSUNAMI CARE AMONG NURSES IN BANDA ACEH, INDONESIA

Cut Husna, MNS, RN.,[1], Asst. Prof. Dr. Urai Hatthakit, RN[2], Assoc. Prof. Dr. Aranya Chaowalit, APN[3]

Background: Nurses are a part of health care provider who has responsibility to respond to disaster. The nurses ought to have sufficient knowledge and skills in caring for patients in disasters such as in a tsunami. Clinical skills of nurses effectively help the nurses in handling the tsunami emergency response.
Objectives: To describe the levels of perceived clinical skills for tsunami care in acute response phase (6 months) after tsunami struck, and to examine the relationship between emergency training, education, and perceived clinical skills for tsunami care in Banda Aceh, Indonesia.
Methods: This was a correlational study. Systematic random sampling was employed to recruit 97 nurses in a hospital in Banda Aceh, Indonesia. Data were collected using questionnaires developed by the researchers and colleagues. The questionnaires consisted of two main parts: The Demographic Data Questionnaire (DDQ) and The Tsunami Care Questionnaire (TCQ).
Results: Overall, perceived clinical skills for tsunami care were at a moderate level with the total mean score of 3.52 (SD = 0.86). Pearson product moment correlation coefficients indicated significant relationships between perceived clinical skills for tsunami care and attending emergency training and education ($r = .23$, $p < .05$).
Conclusion: The nurses in the hospital should maintain and improve their knowledge and skills by regularly attending emergency training and education in order to respond to disaster more effectively.

Keywords: Education and perceived clinical skills, tsunami care, nurses

[1] Medical and Surgical Nursing, Nursing School, Faculty of Medicine, Syiah Kuala University, Banda Aceh, Indonesia.
[2] Assistant Professor, Department of Administration of Nursing Education and Nursing Service, Faculty of Nursing, Prince of Songkla University, Hat Yai, Songkhla, Thailand.
[3] Associate Professor, Department of Administration of Nursing Education and Nursing Service, Faculty of Nursing, Prince of Songkla University, Hat Yai, Songkhla, Thailand.

Background

The 2004 tsunami not only killed massive numbers of people but also caused extensive damage to infrastructures including five hospitals in Banda Aceh, 122 hospitals and public health centers in neighboring districts (Garfield & Hamid, 2006). Health care providers and clinical networks beyond the hospitals were left in disarray. The lack of a medical disaster plan, supply of stockpiles and deployment of personnel were painfully evident in the immediate aftermath of the tsunami (Garfield & Hamid, 2006).

The tsunami impacts the physical, psychological, psychosocial, and spiritual health of the affected persons. Maegele et al. (2006) declared that two-thirds of tsunami victims were reported to have combined injuries to the thorax or fractures. Those who survived from drowning were involved in the aspiration of immersion fluids of seawater, marine and soil debris into the respiratory tract resulting in pneumonitis and pneumonia. Approximately 5 to 10% of the affected population developed persistent psychological problems such as depression, posttraumatic stress disorder (PTSD), or other anxiety disorders which were characterized by flashbacks, emotional detachment, sleep difficulties, and other disruptions (Maegele et al., 2006). Furthermore, Tuicomepee and Romano (2006) found that tsunami also caused psychosocial reaction to loss of livelihood, loss of loved ones, and displacement of homes. Moreover, there were spiritual symptoms of the affected tsunami patients and family, as well as loss of goals in life, instant anger, and guilt (Hatthakit & Thaniwathananon, 2007). Lastly, the psychospiritual impacts of tsunami patients include experiencing grief, guilt, and fear in the things they have lost and thus can see no future and losing the will to live (Gregor, 2005).

Several studies showed that ineffective medical response and lack of nurses' clinical skills resulted in inefficient care provided to tsunami patients (Collander et al., 2007). Watcharong, Chuckpaiwong, and Mahaisavariya (2005), they found that several problems arose in the care of traumatized tsunami patients. The available medical personnel were inefficient in their skills, equipment handling, and surgical facilities to deal with the huge number of patients effectively. Collander et al. (2007) mentioned that the failure of the communication system, the ineffective rescue facilities in the hospitals also hindered in the care of traumatic tsunami patients. Many cases such as earthquake, floating, hurricane, and tsunami disasters indicated inadequate nursing care, medical care, poor communication, chaotic management, and meager patient evacuation.

Essentially, nurses ought to be able to provide disaster response, communicate with disaster command, and evacuate tsunami-affected patients. Attending emergency training and education for basic life support (BLS), advanced cardiac life support (ACLS), basic trauma life support (BTLS), and disaster management are important skills each nurse in a disaster area ought to have. These training sessions are essential parts of preparedness - skills for nursing during occasions of a disaster. Education and training provide opportunities for the development and application of knowledge and skills to meet the demands of current roles and functions needed for effective and efficient disaster response (Gould, Berridge, & Kelly, 2007). Thus, this study was conducted to explore the nurses' perceived clinical skills for tsunami care and the relatedness of education and emergency training in handling tsunami disaster. As identified by the College of Registered Nurses of Nova Scotia (2006), the International Nursing Coalition for Mass Casualty Education (2003), and Kaewlai (2009) these clinical skills and educational knowledge ought to include understanding and practice of triage, acute respiratory care, wound care, mental health care, psychosocial care, spiritual care, and patient referral.

Methods

This study was a descriptive correlational study aimed at discovering two aspects of tsunami nursing care: (1) To identify the levels of perceived clinical skills for tsunami care in acute response phase (6 months) after the tsunami struck, and (2) To examine the relationship between perceived clinical skills for tsunami care and attendance in emergency training and education in a hospital in Banda Aceh, Indonesia.

Description of Participants

The target population of the study was the nurses who worked in an acute, emergency and critical care setting of a provincial hospital in Banda Aceh, Indonesia. The number of subjects was estimated by using power analysis (α) of .05, the power of test ($1-\beta$) of .80 and the effect size (ρ) of .30, which is categorized as medium effect size. The estimated sample size was 88 (Polit & Hungler, 1999). To meet this sampling requisite and to prevent a low response rate nine more subjects were added which was 10% of the requisites, therefore, the total sample size was 97 subjects, using systematic random sampling from representative wards of each setting. The nurses who met the following inclusion criteria were recruited: 1)

had been working as a permanent and contracted employee of the hospital, 2) had working experience as a nurse at least a year.

Description of Instrument

The instruments consisted of two main parts, 1) Demographic Data Questionnaire [DDQ], and 2) Tsunami Care Questionnaire [TCQ]. The DDQ consisted of age, gender, marital status, religion, educational background, training and education, and working experience as a nurse. The training and education variable was measured by asking the subjects to indicate type of trainings and number of time attendances on each type of trainings. Type and number of times were multiplied then summed for all types, producing a training experience index. The TCQ was responded with a 5-point Likert-like scale ranging from 1-5, where 1 = very poor, 2 = poor, 3 = fair, 4 = good, and 5 = excellent. For interpretation, perceived clinical skills for tsunami care were averaged for comparable interpretations into three levels: low = 1.0 - 2.3, moderate = 2.4 - 3.7, and high = 3.8 - 5.0. The instruments were validated by three experts. The reliability test was performed with 20 subjects who had similar criteria to the study subjects. The TCQ was tested for internal consistency using Cronbach's alpha coefficients of .98. The training and education questionnaire was tested for stability using test- retest with Spearman' Rho of .98 ($p < .01$).

Ethical Consideration

The research approval was obtained from the Institutional Review Board (IRB) of Faculty of Nursing, Prince of Songkla University, Thailand. The subjects who agreed voluntarily to participate in this study were informed about their right to withdraw at any time for any reasons without any negative consequences. The researcher explained the purpose of the study, expectation from the subjects' participation and potential harmful feelings derived from flashbacks, being sad, depressed, and desperate while completing the questionnaires. No subjects had psychological problems during the data collection phase. The researcher maintained anonymity of the subjects by de-identifying each subject by using codes and all of the information were kept confidential. Data collection was conducted during October to December 2009.

Results

The subjects consisted of 97 nurses who worked in the hospital. All of them were Muslim (100%). Most of the subjects were more than 30 years old (56.7%) with a mean age of 31.9 (SD = 6.6). The majority of the subjects were female (71.1%), married (75.3%) and educated to diploma level (78.4%). Attending emergency training and education of the subjects had six index scores (37.1%) with the mean score of 4.3 (SD = 1.9). Most of the subjects (61.9%) had attended once on disaster management training. Regarding working experience as a nurse, more than half of them (53.6%) had experience more than 5 years with a mean score of 8.7 (SD = 7.5). Approximately 80.4 percent of them had direct experience in caring for tsunami patients during acute tsunami response phase.

Level of Perceived Clinical Skills for Tsunami Care

Overall, the subjects' perceived clinical skills for tsunami care were at a moderate level with the total mean score of 3.52 (SD=0.86). The highest mean score was on triage (M=3.65, SD=0.81), followed by acute respiratory care (M=3.57, SD=0.86), spiritual care (M=3.51, SD=0.93), mental health care (M=3.51, SD=0.99), wound care (M=3.50, SD=0.96), patient referral (M=3.45, SD=0.80), and psychosocial care (M= 3.41, SD=0.84) respectively (Table 1).

Table 1 *Means, Standard Deviations, and the Levels of Perceived Clinical Skills for Tsunami Care (N = 97)*

No	Perceived clinical skills	M	SD	Level
1.	Triage	3.65	0.81	Moderate
2.	Acute respiratory care	3.57	0.86	Moderate
3.	Spiritual care	3.51	0.93	Moderate
4.	Mental health care	3.51	0.99	Moderate
5.	Wound care	3.50	0.96	Moderate
6.	Patient referral	3.45	0.80	Moderate
7.	Psychosocial care	3.41	0.84	Moderate
	Total	**3.52**	**0.86**	**Moderate**

Attending emergency training and education was computed using training index with the mean score of 4.35 (SD=1.96). The index for attending emergency training and education of the subjects are shown in Table 2.

Table 2 *Training Index, Frequency, and Percentage of Emergency Training and Education (N = 97)*

Training index	Types of training	Frequency	Percentage
0	None	11	11.3
1	ATLS[1]	2	2.1
2	ATLS[1], BTLS[1]	4	4.1
3	BLS[2], ACLS[1]	4	4.1
4	BLS[1], DM[2], IC[1]	16	16.5
5	BLS[1], DM[1], IC[2], MC[1]	24	24.8
6	BLS[1], ACLS[1], BTLS[1], DM[1], IC[1], MC[1]	36	37.1
	Total	**97**	**100**

ATLS[1]: Advanced trauma life support (1 time), BTLS[1]: Basic trauma life support (1 time), BLS[1]: Basic life support (1 time), BLS[2]: Basic life support (2 times), ACLS[1]: Advanced cardio life support (1 time), DM[1]: Disaster management (1 time), DM[2]: Disaster management (2 times), IC[1]: Infection control and prevention (1 time), IC[2]: Infection control and prevention (2 times), MC[1:] Mental health care for tsunami survivors (1 time)

The Relationship between Perceived Clinical Skills for Tsunami Care and Attending Emergency Training and Education

The result showed (table 3) that attending emergency training and education was statistically significant low positive correlated with perceived clinical skills for tsunami care ($r = .23$, $p < .05$) except for wound care.

Table 3 *Correlation Coefficients between Perceived Clinical Skills for Tsunami Care and Attending Emergency Training and Education (N = 97)*

Variable	Perceived Clinical Skills for Tsunami Care							
	1	2	3	4	5	6	7	Total
Attending emergency training and education	.21*	.23*	.21*	.21*	.20	.27**	.26*	.23*

Note: *$p<.05$, **$p<.01$.
1 = Triage, 2 = Acute respiratory care, 3 = Spiritual care, 4 = Mental health care, 5 = Wound care, 6 = Patient referral, and 7 = Psychosocial care

Discussion

Overall, the findings of this study found that subjects' perceived clinical skills for tsunami care were at a moderate level. There are several reasons that might have contributed to the findings of perceived clinical skills for tsunami care in this study.

First, the majority of the subjects (78.4%) were diploma level. Educational level of the subjects might have played an important role in the results. Diploma level might have indicated a limited existing knowledge for tsunami response usually dealing with complicated problems, insufficiency of skill in seeking information, and limited capability to develop further advanced clinical skills in response to complicated health problems. The subjects who had formal education at the diploma level might have a lack of mastery on their knowledge to prepare their skills in tsunami response. Similarly, a recent study found that the nurses whose education were the diploma level showed lower level of knowledge and skill than baccalaureate, master or doctoral students in clinical management systems (Chan, 2009). Moreover, the nurses who have diploma level showed lower level in theoretical and clinical components for collected evaluation data, written assignment skill testing, contribution to conference, self-assessment, and other types of nursing program than baccalaureate and master levels of nurses (Oermann, Yarbrough, Saewert, Ard, & Charasika, 2009). Therefore, the level of education of the nurses might have influenced the nurses' role in responding to an emergency disaster and the willingness to respond (Evers & Puzniak, 2005).

Second, the reason that might have influenced the moderate level of perceived clinical skills for tsunami care is age. Almost half of the nurses in this study were aged less than 30 years (43.3%). It is evident that the nurses who were more than 30 years old have capability to perform sufficient clinical skills as a result of accumulated experience and knowledge on clinical practice. Consistently, Chan (2009) found that young adults age (26-30 years) had lower of knowledge and skill levels than middle adults age (31-40 years) in clinical management systems. This could imply that the young adults aged less than 30 years old might not have yet enough accumulated experience in performing clinical skills leading to limited capability and competency to perform specific and advanced clinical skills needed in caring for tsunami patients in acute response phase in hospital setting. However, young adults have higher in memory capacity, speed of processing information and low inhibition than older adults (Marsiske & Willis, as cited in Kliegel & Martin, 2007), thus the young adults should be encouraged to have continuing education. Training emphasizing on emergency and disaster should be able to improve their knowledge and skills in caring for tsunami patients.

Third, the reason that might have influenced the moderate level of perceived clinical skills for tsunami care is working experience. Even though the majority of the subjects had direct experience in caring for tsunami patients (80.4%) but it was in late acute response phase for three months in average of the first 6 months after the tsunami struck which is

considered as acute tsunami response phase (Garfield & Hamid, 2006). The main reason for did not involve in the care during initial stage of the acute response phase was that many hospitals were seriously destroyed and could not function for the first few months, and many nurses were killed and affected by the tsunami. Hence, most of the tsunami patients were cared by a collaboration of overseas and Indonesian nurses in various temporary and field hospitals around Banda Aceh for the first 3 months. This indicates that most of the subjects had some clinical skills by transforming experience to performing the nursing activities for tsunami patients. However, the limited duration of direct care of the tsunami patients in this study may have influenced the moderate level of perceived clinical skills for tsunami care. The experience in direct care and exposure to an event contribute to capability, expectation of more efficiency and mastery of skills while performing nursing practice. Watson (as cited in Considine, Botti, & Thomas, 2007) indentifying that there were three criteria for experience: 1) the passage of time, 2) gaining skills or knowledge, and 3) exposure to an event. Passing of time is commonly used to define experiences in nursing, where years of experience are used to categorize the skill of nurses.

The last, the reason that could explain the finding on the moderate level of perceived clinical skills for tsunami care is training and education. The finding of this study showed that more than one-third (37.1%) of the subjects had attended only once on the six different topics related to tsunami care of BLS, ACLS, BTLS, disaster management, infection control and prevention, and mental health care for tsunami survivors training. Moreover, 11.3 percent of the subjects were never trained. This could be interpreted that training on emergency response and disaster management for tsunami care were insufficient and lack of continuity (Table 2).

Consistently, Gould et al. (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. Moreover, Evers and Puzniak (2005) mentioned that the nurses need more training and preparation for appropriate response to emergency and disaster. Smith, Gilcreast, and Pierce (2008) suggested that emergency training of BLS and ACLS needs to be improved by more frequencies refresher training and allow more times for hands-on skills practice. Kobayashi, Shapiro, Suner, and Williams (2003) mentioned that disaster and emergency training was provided with specific and unique skills set, yet will need to be performed efficiently to respond to emergency or disaster.

Training and education was significantly low positive correlated with perceived clinical skills for tsunami care ($r = .23$, $p < .05$) except for wound care. Emergency training and education are essential parts to improve skills of nurses while handling disaster response. The emergency training and education in this study consisted of disaster management, BLS, ACLS, BTLS, infection control and prevention, and mental health care for tsunami survivors. The previous study supported that skills of nurses gained by attending emergency training 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. The training program would be increasing knowledge and skills when contents, methods, and strategies fit the characteristics of participants. Similarly, (Jensen et al., 2008) reported that the nurses who have worked for a half year on resuscitation advanced life support (ALS) training were correlated to have increased their knowledge and skills. It is evident that training interventions for health care providers were effective in improving knowledge and skills in disaster response (Williams, Nocera, & Casteel, 2008). Congruently, existing studies revealed that 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) while practicing BLS can develop confidence and skills of the nurses in the care of the patients (Reynolds, 2010). Castle, Garton, and Kenward (2007) explained that nurses have improved their confidence and skills with regular BLS training compared with those who were not been trained. Therefore, mandatory attending emergency and disaster trainings are important for all nurses who taking care of the patients exposed by the disaster.

One surprising finding of this study was on the nurses' perceived clinical skills for tsunami care particularly for wound care. This showed that training and education was not significantly correlated with wound care (Table 3). However, this finding could be explained based on the training index score showing that none of the subjects was trained for wound care specific for tsunami patients (Table 2). Tsunami wound care requires specific clinical skills because the wounds were significantly contaminated by foreign materials such as seawater, mud, sand, soil, vegetation, stick, and corals which were often lodged inside the cavities of open wounds (Maegele et al., 2006). It was reported that nearly 90 percent of the wounds needed debridement (Prasartritha, Tungsiripat, & Warachit, 2008).

Tsunami wounds have specific and complicated problems were very difficult to be treated. In this study, it was found that the nurses were not trained for specific content of tsunami wound care and had limited direct experience in acute response care for caring of wounds. Hence, most of these nurses did not obtain high scores in the perceived clinical skills for tsunami care data. This was supported by Lukthitikul and Hatthakit's study (2007) that reported that the nurses lacked knowledge and skills to provide care to tsunami patients having wounds, particularly in the cleaning and suturing of wounds. Similarly, it was found that almost all of the patients with wounds sustained from the tsunami also were open fractures and infected due to insufficient knowledge and skills of health care providers for infection control (Watcharong et al., 2005).

Conclusion

In this study, the nurses' perceived clinical skills in triage, acute respiratory care, spiritual care, mental health care, wound care, patient referral, and psychosocial care were found to be at a moderate level. The type of participants as depicted by the demographic data might have contributed to the moderate level of subjects' perceived clinical skills including the education level at the diploma level, age, working experience as a nurse, and direct experience in caring for tsunami patients. The findings of this study also showed that nurses' perceived clinical skills for tsunami care in acute response phase were statistically significant although at a low positive correlation for attendance in emergency training and education except for wound care. These findings suggest that effective training program on emergency and disaster care is very important to improve the nurses' clinical skills for tsunami care, specifically for the content on tsunami wound care - it needs to be provided for the nurses who are responsible for tsunami victims in acute response phase.

Recommendations

It is recommended that the clinical practitioners and hospital policy makers are made aware of the importance of training provisions on emergency and disaster care for nurses of tsunami victims. These training, education, and skills acquisition needs improvement by regularly attending training and educational programs in order to meet the demands of a standardized level of preparedness especially in a locale that is identified as prone to repeat disasters like Banda Aceh, Indonesia.

Acknowledgments

The authors gratefully thank the Director of the Institute for Research and Development on Health and Epidemiology Unit, Faculty of Medicine, Prince of Songkla University, Prof. Dr. Virasakdi Chongsuvivatwong and the Graduate School, Prince of Songkla University, Thailand for their assistance and partial funding to support this study.

References

Castle, N., Garton, H., & Kenward, G. (2007). Confidence vs competence: Basic life support skills of health professionals. *British Journal of Nursing (BJN), 16*(11), 664-666.

Chan, M. F. (2009). Factors affecting knowledge, attitudes, and skills levels for nursing staff toward the clinical management system in Hong Kong. *Computers Informatics Nursing 27*(1), 57-65.

Collander, B., Green, B., Millo, Y., Shamloo, C., Donnellan, J., & DeAtley, C. (2007). Development of an "All-Hazards" hospital disaster preparedness training course utilizing multi-modality teaching. *Prehospital and Disaster Medicine*, 63-68.

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

Doyle, S., Gallagher, J., Bell, M., Rochford, C., & Roynane, S. (2008). Establishing a ' train the trainer' education model for clinical skills development. *Nursing Older People, 20*(5), 34-37.

Evers, S., & Puzniak, L. (2005). Bioterrorism knowledge and emergency preparedness among school nurses. *The Journal of School Health, 75*(6), 232.

Garfield, R., & Hamid, A. Y. (2006). Tsunami response: A year later. *American Journal of Nursing, 106*(1), 76-79.

Gould, D., Berridge, E.-J., & Kelly, D. (2007). The national health service knowledge and skills framework and its implications for continuing professional development in nursing. *Nurse Education Today, 27*(1), 26-34.

Gregor, S. (2005). Resilience after a disaster Retrieved August 1, 2009, from http: www..psychology.org.au/publications/inpsych/disaster/

Hatthakit, U., & Thaniwathananon, P. (2007). The suffering experiences of Buddhist tsunami survivors. *International Journal for Human Caring, 11*(2), 59-66.

Jensen, M. L., Lippert, F., Hesselfeldt, R., Rasmussen, M. B., Mogensen, S. S., Jensen, M. K., et al. (2008). The significance of clinical experience on learning outcome from resuscitation training: A randomized controlled study. *Resuscitation, 80*, 238-243.

Kliegel, M., & Martin, M. (2007). Adult age differences in errant planning: The role task familiarity and cognitive resources. *Experimental Aging Research*(33), 145-161.

Kobayashi, L., Shapiro, M. J., Suner, S., & Williams, K. A. (2003). Disaster medicine: The potential role of high fidelity medical simulation for mass casualty incident training. *Medicine and Health Rhode Island, 86*(7), 196.

Lukthitikul, S., & Hatthakit, U. (2007). Wound care for tsunami victims of nurses at hospitals of Phang-Nga province. *Songklanagarind Medical Journal, 25*(5), 391- 400.

Maegele, M., Gregor, S., Yuecel, N., Simanski, C., Paffrath, T., Rixen, D., et al. (2006). One year ago not business as usual: Wound management, infection and psychoemotional control during tertiary medical care following the 2004 tsunami disaster in southeast Asia. *Critical Care 1*(2), 1-9.

Oermann, M., Yarbrough, S., Saewert, K., Ard, N., & Charasika, M. (2009). Clinical evaluation and grading practices in schools of nursing: National survey findings part II. *Nursing Education Perspectives, 30*(6), 352.

Polit, D. F., & Hungler, B. P. (1999). *Nursing research: Principles and methods* (6 th ed.). Philadelphia: Lippincott.

Prasartritha, T., Tungsiripat, R., & Warachit, P. (2008). The revisit of 2004 tsunami in Thailand: Characteristics of wounds. *International Wound Journal 5*(1), 8-19.

Reid, W. M., Ruzycki, S., Haney, M. L., Brown, L. M., Baggerly, J., Mescia, N., et al. (2005). Disaster mental health training in Florida and the response to the 2004 hurricanes. *Journal of Public Health Management & Practice, 11(6)*(Supplement), S57-S62.

Reynolds, E. (2010). Basic life support... this practice profile is based on NS494 Denton A, Giddins P (2009) A collaborative and progressive approach to basic life support. Nursing Standard. 23, 38, 49-55. *Nursing Standard, 24*(18), 59-59.

Smith, K. K., Gilcreast, D., & Pierce, K. (2008). Evaluation of staff's retention of ACLS and BLS skills. *Resuscitation, 78*(1), 59-65.

Tuicomepee, A., & Romano, J. L. (2006). Children and adolescents in natural disasters: Psychological implication for Thai youth affected by the 2004 tsunami. *Journal of Mental Health of Thailand*.

Watcharong, C., Chuckpaiwong, B., & Mahaisavariya, B. (2005). Editorial: Orthophaedic trauma following tsunami: Experience from Phang Nga, Thailand. *Journal of Orthopaedic Surgery, 13*(1), 1-2.

Williams, J., Nocera, M., & Casteel, C. (2008). The effectiveness of disaster training for health care workers: A systematic review. *Annals of Emergency Medicine, 52*(3), 211-222.