

## Perception and Core Competencies of Disaster Nursing in South Korea

Ji Young Noh<sup>1</sup>, Eui Geum Oh<sup>2\*</sup>, Won Hee Lee<sup>2</sup> and Mona Choi<sup>2</sup>

<sup>1</sup>Severance Hospital, Yonsei University, Korea

<sup>2</sup>College of Nursing, Yonsei University, Korea

\*Corresponding author: Eui Geum Oh, 50 Yonsei-ro, Seodaemun-gu, Seoul, Korea 03722, Tel: +82-2-2228-3256, Fax: +82-2-2227-7800; E-mail: euigeum@yuhs.ac

Received date: January 11, 2017; Accepted date: February 25, 2017; Published date: February 28, 2017

Copyright: © 2017 Noh JY et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

**Background:** A descriptive correlational study was conducted to investigate the disaster-related experience, perception, and core competency of nurses in South Korea.

**Methods:** Data were collected through a self-administered questionnaire given to 163 nurses working in tertiary hospitals in Seoul, Korea. The questionnaire was developed based on the frame of Disaster Nursing Competencies by International Council of Nurses (ICN) and Emergency Preparedness Questionnaire (EPIQ).

**Results:** In a 5-point scale, the awareness of nurses for disaster events, and the importance of education for disaster nursing were  $3.93 \pm 0.91$  and  $3.63 \pm 0.93$ , respectively. Among ICN core competencies on perceived importance in disaster nursing, "Risk reduction, disease prevention and health promotion and psychological care" was scored highest, whereas "Policy development and planning, communication and information sharing" was the lowest. The higher level of awareness of a disaster was related to the higher level of perceived importance of education.

**Conclusion:** The results support that the level of awareness of a disaster is a factor affecting the importance of education in disaster nursing. Thus, educational programs focusing on practical topics in disaster nursing should be developed for continuous training to increase the core competency and the understanding of disaster nursing.

**Keywords:** Disaster nursing; Perception; Core competencies; Korea

### Introduction

Numerous countries around the world are experiencing various types of unexpected disasters such as tsunamis and earthquakes. Extreme weather events such as the effects of global warming and environmental destruction due to rapid industrialization have caused natural disasters, as well as various man-made disasters. Furthermore, there has recently been an increase in the tendency for South Korea to experience numerous large-scale disasters in social and anthropogenic terms leading to mass casualties and large property losses [1]. Recent events such as the Sewol Ferry sinking incident, as well as the Middle East Respiratory Syndrome pandemic has elevated government and public awareness in the importance of disaster preparedness. A disaster is an event that harms people's lives, and causes physical and financial damages at individual and national level; in a large-scale disaster, it can generate demands exceeding available resources. Furthermore, from a medical and health sciences perspective, a disaster, especially large-scale disaster signifies an event that generates numerous patients that exceed medical resources available for treatment [2,3]. In relation to these various contemporary changes, it is predicted that the possibility and frequency regarding the occurrence of various disasters will continue to increase. Although there is urgent need for the health and medical professions to prepare for such events, a systematic health care system in response to various disasters has still not been established. Temporary measures such as experiences learned from participation in medical field support or emergency teams cannot meet the complex needs of nursing that are required in these new disaster situations.

Nurses in disaster situations must be able to assess a wide range of nursing needs and to establish plans within situational context of disasters, which differs from the health care that they normally provide in the clinics or to the local community. They also must be able to maintain a comprehensive and collaborative cooperation system, understand the special environments, and serve to ensure safety [4]. Up to now, nurses were assigned to disaster sites in relation to their department positions or personal experiences. However, systematic education and training in preparation for disaster nursing is needed. In accordance to 'Disaster Nursing Competencies' published by the International Council of Nurses (ICN) in 2009, as a guide on training and education development to promote disaster nursing competency, the ability required to perform disaster nursing involves an integrated and mutually supportive attitude, and nurses must be equipped with knowledge and capabilities to provide disaster nursing services; and this can be strengthened by demonstrating their leadership qualities. During a disaster, nurses must monitor the changes in the environment and organizational activities, reduce the threats to health, assess the health care needs of targets, as well as bear the legal and ethical responsibility in accordance with the medical laws. Furthermore, as facilitator for appropriate resource utilization, they must be able to act within the cooperative systems and be responsible for the corresponding role. To achieve this task, nurses must first be equipped with the ability to protect themselves from the disaster, and acquire professional development in preparation and training for disaster events [5]. Korean Nurses Association [6] has also stated that the role of nurses during disaster events has the contextual features distinct from everyday clinical settings or health care services in the local community; in terms of the principles or basic techniques of nursing, it

has mentioned that disaster events demand further requirements in physical, social, emotional, spiritual, and management aspects of nursing, which contain the features of core competencies published by ICN. Therefore, disaster nursing education must be based on the core competency requirements as described above, such as definition of disaster, philosophy of disaster nursing (e.g., causes, impacts, disaster phases, survival strategies, etc.), mass casualty care, communication, systematization, coordination issues, triage process, psychological issues pertinent in disaster situations, overall role of nurses, role of leadership, assessment of health needs, utilization of personnel and resources and evaluation of provided nursing care and services [7,8]. Numerous studies have mentioned the need for education and training regarding the nurse's own field to care for patients during disaster events that are rarely encountered in the usual practice [9-12] and countries that have experienced disasters such as the United States and India recognized the severity of the problem and organized discussions and workshops regarding nurse education [13-15]. Meanwhile, researches in South Korea are mainly focused on the field of emergency medicine in the response phase during the occurrence of a disaster, and the administrative approach for the maintenance of a disaster management system [16-18]. In nursing, research has been limited to developing and promoting the disaster nursing curriculum for students, such as family recovery support system [19], social support [20] or research on disaster experience and disaster preparedness of college students in a certain region [21]. There are insufficient research works done on disaster preparedness and response capacity building for nurses [22]. The purpose of this study is to find out the level of disaster awareness of nurses, importance of disaster nursing education, and core competencies, and to identify the relationship between the variables.

## Materials and Methods

### Study design and participants

The authors conducted a descriptive and cross-sectional survey to identify the level of disaster awareness of nurses, importance of disaster nursing education, and core competencies of Korean nurses on disaster nursing. Convenience sampling was conducted in three general hospitals with over 500 beds located in Seoul, Korea. Participants were selected using the G\*power 3 program [23], which is a sample size calculation program based on Cohen's sampling formula, and a sample size of 120 was calculated at the 5% significance level and 80% statistical power with effect size of 0.25 when using the t-tests. Total of 200 samples were used considering drop out and incomplete responses of the survey.

### Measurement tools

A structured questionnaire was used as the tool for data collection, and the questionnaire consisted of 11 general questions regarding the participants, 13 questions on experience with disaster, disaster nursing, and perception, and 15 questions on disaster nursing core competencies, for a total of 39 questions.

### Perception and experience on disaster and disaster nursing

After reviewing the literature, 13 questions were created to measure the level of general experience and perception of nurses regarding disaster and disaster nursing. Out of the 13 questions, 11 questions on the characteristics of disaster-related experience and the perception of

disaster were measured through nominal scale, while the other 2 questions on the awareness about seriousness of disaster and about importance of disaster nursing education were measured on a 5-point Likert scale: a higher score indicates higher perception level on disaster. Developed questions were modified and refined after being reviewed for inadequate phrases or contents, and the face validity of the questions were verified through sample survey conducted by three nursing school professors and three nurses with disaster experiences.

### Measuring tools for core competencies on disaster nursing

A total of 15 questions were developed based on the 44 Emergency Preparedness Questionnaire (EPIQ) [24] developed by the Wisconsin Health Alert Network in 2003, and 10 Frames of Disaster Nursing Competencies published by the International Council of Nurses (ICN) in 2009 [5]. Each question item selected was scored using a 5-point Likert scale that ranged from 5 points 'strongly agree', 4 points 'agree', 3 points 'neither agree nor disagree', 2 points 'disagree', and 1 point 'strongly disagree'. The total sum of the points ranged from 15 points to 75 points, and a higher score indicates a higher level of core competencies on the ability to perform regarding disaster nursing. The face validity of the questionnaire was verified by three nursing school professors and three nurses with disaster experiences, and a preliminary examination was conducted to modify and refine any inadequate contents or phrases of the questionnaire. The Cronbach's alpha coefficient regarding the measurement tools for disaster nursing competencies in this study was 0.94.

### General characteristics of the nurses

A total of 11 questions were developed consisting of demographic characteristics such as gender, age, education, and religion, as well as job-related characteristics (e.g. position within the department, type of work, total clinical nursing experience, and hospital department they are currently working).

### Data collection

The data for this study were collected from May 1 through May 30, 2010 after being approved by the Research Ethics Committee of the College of Nursing at Yonsei University. Data were collected by visiting three general hospitals in Seoul, Korea. Participants were extracted using convenience sampling and by obtaining informed consent to participate in the study. The researcher visited the corresponding sites to distribute the questionnaires and to communicate general information and details regarding the questionnaire. The participants themselves filled out the questionnaire, and a contact number of the researcher was provided on the cover of the questionnaire in case the participants had hard time understanding the questionnaire or had any questions about the research. A total of 200 copies were distributed; of which 25 copies (12.5%) were not returned, and 12 copies (6%) with inadequate responses were excluded from the collection, resulting in a total of 163 samples (81.5%) being used in the analysis.

### Statistical analysis

For data analysis, SPSS/WIN version 12.0 was used. Participant's general and job characteristics, as well as characteristics on disaster-related experience were expressed using descriptive statistics using numbers, percentage, as well as means and standard deviation. Descriptive statistics were also used to analyze participant's level of awareness and importance of education about disaster nursing and the

self-rating core competency scores, each expressed in frequency, percentage, as well as means and standard deviation. Independent t-tests were conducted for an analysis on the level of disaster awareness and core competencies related to disaster nursing based on the characteristics of the participants. Pearson correlation was used to analyze the relationship between the levels of disaster awareness and importance of education. Cronbach's alpha coefficient was used to calculate the internal reliability of the tool.

## Results

### General characteristics of the participants

The general characteristics of the participants are shown in Table 1. The average age of the participants was 28.3 years old, and 96.3% of the

participants were female. Among work related characteristics, the participants' average clinical experience from their respective hospitals was 2.9 years, ranging from a minimum of 2 months to a maximum of 21 years, with the highest percentage (38%) for the group of 2 to 4 years. Eleven respondents (6.7%) said they had personally experienced or witnessed a disaster, which indicates that majority of nurses had no experience with disasters. Only 57 participants (35%) had learning experience in disaster-related education, and 126 participants (77.3%) expressed willingness to participate in an educational program on disaster nursing if provided.

Category		N (%)	M (SD)
Age (year)			28.3 (± 5.2)
Sex	Male	6 (3.7)	
	Female	157 (96.3)	
Level of Education	Diploma graduates	67 (41.1)	
	Bachelor degree	78 (47.8)	
	Master's degree or over	18 (11.1)	
Experience in Nursing (year)	<2	35 (21.5)	2.9 (± 1.6)
	2-4	62 (38)	
	5-7	34 (20.9)	
	8-10	10 (6.1)	
	10<	22 (13.5)	
Clinical Area	Medical/Surgical Unit	40 (24.5)	
	Critical Care Unit	38 (23.3)	
	Emergency Room	28 (17.2)	
	Operation Room	36 (22.1)	
	Outpatient/Lab, etc.	21 (12.9)	
Experience of education on disaster nursing	Yes	57 (35)	
	No	106 (65)	
Need on disaster nursing education	Yes	126 (77.3)	
	No	37 (22.7)	
Nurses who have witnessed or experienced disaster	Yes	11 (6.7)	
	No	152 (93.3)	

### The level of perception and core competencies of nurses on disasters

The average score for the level of disaster awareness was 3.93 (± 0.91). Over 55% of the participants (97 nurses) answered that disaster

can happen, indicating seriousness of disasters. And 65 participants (37.4%) expressed their awareness of the importance of disaster nursing education by answering that such education is 'necessary', which resulted in an average score of 3.63 (± 0.93) (Table 2).

Category	M (SD)
Disaster awareness	3.93 (± 0.91)
Importance of disaster nursing education	3.63 (± 0.93)

**Table 2:** The level of perception of nurses on disasters.

As for the self-assessment scores on the level of core competencies on disaster nursing, the total average was 40.82 (± 9.77) out of 75 points, and the average scores for each item was 2.73 (± 0.27) out of 5

points, indicating that the participants' level of core competencies on disaster nursing were moderate. However, given that this was a self-reporting questionnaire, it should be noted that there can be a difference between this result and the actual competencies. The highest average of 3.14 (± 0.79) among the core competency category was reported in the item "Aware of duties medical staffs have to perform under disaster", whereas the lowest average of 2.14 (± 0.83) was reported in the item "Aware of procedure to record nursing in documents" (Table 3).

ICN Frame	Category	M (SD)
Care of the community, Communication and information sharing	Aware of procedure to record nursing documents.	2.14 (± 0.83)
	Aware of procedure to transfer information of important targets to other medical staffs and those concerned.	2.35 (± 0.89)
Policy development and planning	Able to inspect, monitor, and report on patients as nurses.	2.54 (± 0.87)
Care of the community and accountability	Aware of medical system of local community and perform nurses' roles.	2.56 (± 0.83)
Communication and information sharing	Able to collect necessary information and share it with health managers effectively.	2.59 (± 0.92)
Ethical and legal practice, and accountability	Aware of disaster-related guidelines of current respective organization.	2.63 (± 0.93)
Care of individuals and families	Able to provide proper nursing care according to triage.	2.72 (± 0.97)
Long term care and evaluation	Health consulting/training can be provided to targets on long-term impact by disaster.	2.73 (± 0.85)
Ethical and legal practice, and accountability	Missions can be shared together with main partners who are concerned in disaster prevention.	2.81 (± 0.93)
Care of individuals and families	Backgrounds and conditions of different targets can be understood and inspected.	2.85 (± 0.87)
Education and Preparedness	Aware of role and general response to disaster situation	2.89 (± 0.77)
Care of vulnerable populations	Sensitive and weak targets (seniors, pregnant women, the disabled, etc.) can be provided with proper nursing care during disaster.	2.89 (± 0.89)
Psychological care	Proper psychological support can be provided to all people concerned in disaster occurrence.	2.90 (± 0.91)
Risk reduction, disease prevention and health promotion	Able to provide emergency first-aid to victims of disaster	3.09 (± 0.81)
Education and Preparedness	Aware of duties medical staffs have to perform under disaster.	3.14 (± 0.79)
Subtotal		2.73 (± 0.27) <sup>1)</sup>
Overall		40.82 (± 9.77) <sup>2)</sup>

**Table 3:** The level of core competencies on disaster nursing, N=163; 1) Range: 1~5, 2) Range:15~75 ( 5 points × 15 items).

### The level of disaster awareness and core competencies in accordance to participant's characteristics

Group with over 3 years of clinical nursing experience had higher levels of disaster awareness when compared to the group with less than 3 years of experience and the difference was statistically significant (t=2.414, p=0.017). Among job-related characteristics, nurses with over 3 years of work experience reported a higher core competency value of 41.83 (± 9.69) points, however, work experience and core competencies were not statistically significant (t=1.287, p=0.200). Furthermore, in terms of disaster-related experience characteristics, nurses that recently experienced or witnessed a disaster had the highest core competency level of 45.46 (± 10.10) points, but also was not statistically significant (t=1.726, p=0.107).

### Relationship between disaster awareness and importance of education

The awareness level regarding the seriousness of disasters and the level of perceived importance regarding education on disaster nursing present a significant quantitative correlation, indicating that the more seriously the participants perceive disasters, the higher awareness they have regarding the necessity for disaster nursing education (r=0.583, p<0.001).

### Discussion

In this study, the level of seriousness felt towards disaster nursing and the importance felt towards the need for disaster nursing

education scored 14.82 out of 25 points, which is a similar result with previous studies that were conducted with an emphasis on the importance of disaster nursing education [9,25-27]. In many of the countries, there is a growing trend to establish disaster focused department, to provide education for providers to manage disaster prevention, response, and recovery phases in an integrated manner and to exhibit their leadership in preparation for disasters [28-30]. However, disaster nursing education in South Korea is limited to creating workforces in the prevention-oriented sectors, which is important. But additionally, training approaches to an integrated management of each disaster phase led by capable disaster managers are required. In response to these needs, South Korean researchers have studied the development of a 2 year curriculum associated with a bachelor degree in disaster management, as well as related research and evaluation [31]. To achieve this goal, a viable learning environment such as lectures, hands-on training, simulations, and seminars with case studies needs to be provided by connecting undergraduate courses with graduate courses, hospitals, local communities, and government organizations [32]. In addition, sustainable programs must be created for the skilled practitioners to have the capability as a manager, leader, and educator to facilitate an integrated disaster management.

The results for the level of core competencies on disaster nursing indicated that the highest average value was “aware of duties medical staffs have to do under disaster” at 3.14 ( $\pm$  0.79) out of 5 points, followed by “able to provide emergency first-aid to victims of disaster” at 3.09 ( $\pm$  0.81), whereas the lowest average value was “aware of procedure to record nursing in documents” at 2.14 ( $\pm$  0.83) points. Preceding research by Ablah et al. [33], which used the 44 question EPIQ developed by the Wisconsin Health Alert Network in 2003, also indicated a similar result with the highest average of 3.15 points in the basic emergency responses, followed by the ability to identify and respond to general tasks related to disasters with a high score of 2.85 points. The category with the lowest value in this study was the section about recording documents on nursing provided during the disaster to communicate with other disaster managers. Furthermore, psychological care scored 2.90 ( $\pm$  0.91) low points among core competencies. Because the perceived performance competency scores were low, this suggests that competency enhancement of nurses in the event of a disaster should be directed more to the bridging role between the hospital and the local community through continuous data collection and management, and towards psychological support interventions immediately after the disaster. When examining studies related to disaster and stress, Kato et al. [34] reported that disaster damage, self-efficacy, and social support were factors that affected psychological stress of the disaster patient after a volcanic eruption event. Math et al. [35] reported that prevalence of mental health problems in disaster affected population is found to be higher by two to three times than that of the general population. In a systemic review study, it was found that 11%-38% distressed individuals presenting for evaluation at shelters and family assistance centers have stress-related and adjustment disorders, and up to 40% of distressed individuals had pre-existing disorders [36]. A strategy for the psychological care such as emotional support is necessary and must not be overlooked considering that the relocation of victims' lives due to natural disasters causes environmental, social, and psychosocial stress.

This study indicates an increase in the level of awareness in relation to an increase in work experience. This result indicates that this group is the most motivated group of learners that could be the best candidate for developing expert and specialized disaster care providers.

In the United States, disaster-related health services are managed and directed by professional nurses, and disaster-related health services training programs are established and operated as supplemental education programs for nurses. As new aspects of health and medical problems are expected to emerge due to frequently occurring disasters, preparing professional workforces responsible for the activities in disaster events is needed along with the development of a process for educational preparation, and the need for the development of task protocols for providing disaster-related health services. However, increased work experience and previous disaster experience did not show statistically significant result when compared to core competencies. This means that experience alone cannot fulfil nursing competencies in disaster management. To achieve core competencies in disaster nursing, structured and integrated curriculum developed is important.

The results of this study indicate high relationship between disaster nursing awareness and importance of education. Nurses without any disaster-related event experience, information on disaster events are gained through the media, and there is a tendency of growing awareness in disaster in South Korea due to increased media reports related to the increasing disaster events occurring around the world.

There are several limitations to this study. First, the data were collected 6 years ago, but it still represents valuable information. Until now, there hasn't been any research in analyzing the perception of nurses in disaster field in Korea, and these data forms the baseline for current ongoing and future research in this field. Data from this study can be used as a comparison in the changes that may occur to the providers of disaster care, where disaster continues to occur locally and regionally. Second, this study was based on an analysis of nurses selected through convenience sampling. Therefore, features such as work environment or organizational culture of each hospital could not be controlled and thus, one must be cautious to generalize the findings. Furthermore, the perception and experience related to disasters, as well as the level of core competencies on disaster nursing of local community nurses, nurses in local hospitals besides Seoul, and nurses of small and medium hospitals with less than 500 beds were not reflected in the study. Also, because a self-administered questionnaire method was used for the data collection process, there can be individual variations in accordance to the characteristics of the research participant. This may not accurately reflect the level of core competencies in this study and thus requires cautious interpretation.

## Conclusion

This study investigated the level of perception and core competencies of nurses on disasters to achieve better understanding, and to confirm actual conditions of disaster preparedness for nurses. Level of disaster awareness was high for the group with higher total work experience, and the level of core competencies on disaster nursing remained in the average range. In the case of the perceived awareness of disasters and the perceived importance of education on disaster nursing, the more serious feeling towards disaster, there was higher level of need for disaster nursing education. Since disaster events continuously occur in Korea, the large workforce of nurses must be trained and prepared in disaster response. We must be proactive in developing and providing education and training for disaster responses and pay more attention towards disaster nursing field. The results of this study conclude that a structured educational program for disaster nursing at the individual level must be developed to improve the quality of disaster nursing services. Furthermore, this study could be

the basis for future development of programs in an organizational level.

## Disclosure

The authors declare no conflict of interest.

## References

1. National Emergency Management Agency (2014) Disasters Annual Report, National Disaster Information Center, Seoul.
2. National Law Information Center (2014) Framework Act on the Management of Disaster and Safety. Ministry of Public Safety and Security, National Law Information Center.
3. American Medical Association (2012) Basic disaster life support: Provider manual (ver 3.0): American Medical Association.
4. Powers R, Daily E (2008) Nursing issues in disaster health. *Prehosp Disaster Med* 23: 1-2.
5. International Council of Nurses (2015) ICN Framework of disaster Nursing Competencies.
6. Korean Nurses Association (2015) Code of ethics for Korean nurses.
7. Silenas R, Akins R, Parrish AR, Edwards JC (2008) Developing disaster preparedness competence: an experiential learning exercise for multiprofessional education. *Teach Learn Med* 20: 62-68.
8. Williams J, Nocera M, Casteel C (2008) The effectiveness of disaster training for health care workers: A systematic review. *Ann Emerg Med* 52: 211-222.
9. Fung WM, Lai KY, Loke AY (2009) Nurses' perception of disaster: implications for disaster nursing curriculum. *J Clin Nurs* 18: 3165-3171.
10. Öztekin SD, Larson EE, Altun Uğraş G, Yüksel S, Savaşer S (2015) Nursing educators' perceptions about disaster preparedness and response in Istanbul and Miyazaki. *Jpn J Nurs Sci* 12: 99-112.
11. Kuntz SW, Frable P, Qureshi K, Strong LL, Association of Community Health Nursing Educators (2008) Association of Community Health Nursing Educators: Disaster preparedness white paper for community/public health nursing educators. *Public Health Nurs* 25: 362-369.
12. Pattillo MM, O'Day TM (2009) Disaster response: the University of Texas School of Nursing experience. *Nurs Health Sci* 11: 378-381.
13. Danna D, Bernard M, Schaubhut R, Mathews P (2010) Experiences of nurse leaders surviving Hurricane Katrina, New Orleans, Louisiana, USA. *Nurs Health Sci* 12: 9-13.
14. Asia Pacific Emergency and Disaster Nursing Network (APEDNN) Workshop (2013). *Aus Nurs J*, 20: 38-39.
15. Subbian N (2005) Workshop on "Role of Nurses in Disaster Preparedness and Management". *Nurs J India* 96: 151-152.
16. Ahn ME, Hwang SO, Lim KS, Kang SJ (1993) Analysis of Korean Disaster plan with the review of three cases of disasters. *J Korean Soc Eme Med* 4: 27-39.
17. Jang B, Cho J, Kim J, Lim Y, Lee G, et al. (2013) Disaster Medical Responses to the Shelling of Yeonpyeong Island. *J Korean Soc Eme Med* 24: 439-445.
18. Kim J, Kim T (2002) The Normative Structure of the National Disaster Management System. *Fire Science and Engineering* 16: 8-17.
19. Lee O (2000) Development of a Restoration Protocol for the Flood Victims. Seoul: The Graduate School Yonsei University.
20. Lee O, Ahn E, Jeon M (2000) Social Support and Stress in Flood Victims. *J Red Cross Nur* 23: 153-167.
21. Kang KH, Uhm DC, Nam ES (2012) A Study on Disaster Experience and Preparedness of University Students. *J Korean Acad Nurs* 18: 424-435.
22. Lee O, Wang SJ (2008) Exploration on Disaster Nursing Education in Korea. *J Korean Soc Disaster Inf* 4: 94-104.
23. Faul F, Erdfelder E, Lang AG, Buchner A (2007) G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Res Med* 39: 175-191.
24. Hu G, Rao K, Sun Z (2008) Development and testing of a preparedness and response capacity questionnaire in public health emergency for Chinese provincial and municipal governments. *J Cent South Univ T* 33: 1142-1147.
25. Pesiridis T, Kalokairinou A, Sourtzi P (2013) Nursing student's perceptions of disaster nursing: implications for curricula development. *Nur Care and Res* 35: 63-74.
26. Wickramasinghe KK, Ishara MH, Liyanage P, Karunathilake IM, Samarasekera D (2007) Outcome-based approach in development of a disaster management course for healthcare workers. *Ann Acad Med Singapore* 36: 765-769.
27. Loke AY, Fung OW (2014) Nurses' competencies in disaster nursing: Implications for curriculum development and public health. *Int J Environ Res Public Health* 11: 3289-3303.
28. Scott LA, Smith C, Jones EM, Manaker LW, Seymore AC, et al. (2013) Regional approach to competency-based patient care provider disaster training: The Center for Health Professional Training and Emergency Response. *South Med J* 106: 43-48.
29. Nolting FW (2008) Disaster training enters the 21st century. *Northwest Dentistry* 87: 21-23.
30. Shover H (2007) Understanding the chain of communication during a disaster. *J Korean Acad Nurs* 43: 4-14.
31. Kang Y, Lee O, Lee G (1998) A curriculum development on the disaster management. *J Korean Acad Nurs* 28: 210-220.
32. Chan SS, Chan WS, Cheng Y, Fung OW, Lai TK, et al. (2010) Development and evaluation of an undergraduate training course for developing International Council of Nurses disaster nursing competencies in China. *J Nurs Scholarsh* 42(4): 405-413.
33. Ablah E, Tinius AM, Horn L, Williams C, Gebbie KM (2008) Community health centers and emergency preparedness: An assessment of competencies and training needs. *J Community Health* 33: 241-247.
34. Kato H, Miyai H, Uchiumi C, Fujii S, Osawa T (2009) Psychological effects and intervention following a traffic disaster involving a large number of victims. *Seishin Shinkeigaku Zasshi* 111: 411-416.
35. Math SB, Nirmala MC, Moirangthem S, Kumar NC (2015) Disaster management: Mental health perspective. *Indian J Psychol Med* 37: 261-271.
36. North CS, Pfefferbaum B (2013) Mental health response to community disasters: A systematic review. *JAMA* 310: 507-518.