

Iranian Nurses' Experience of Management Competences in Disaster Response: A Qualitative Study

FATEME ALI AKBARI¹, MASOUD BAHRAMI^{2*}, FERESHTEH AEIN³, HAMIDREZA KHANKEH⁴

ABSTRACT

Aim: To explore management competencies required by nurses responding to disasters

Method: This article discusses the findings of a descriptive qualitative study conducted in Iran in 2016-2017. Through face-to-face semi structured interviews, thirty-five nurses with experience in disaster relief were asked about the skills they need to respond to a disaster event as a nurse.

Results: From this study, five themes emerged as areas that nurses require competence in to work effectively in the disaster setting. This article focuses on one theme, nursing management in disaster response. This theme is divided into two main sub themes. The first; *disaster scene coordination* has two subcategories - *psycho-emotional stress management* and *scene safety*. The second sub theme; *management of human and other resource* also has two sub categories - *assessment of required human and other resources* and *operational coordination and management of resources*.

Conclusion: The findings of this study emphasize the need for nurses working in the disaster setting to be aware of professional responsibilities and familiar with management skills related to disaster situations.

Keywords: Disaster response, Management skills, Nurses

INTRODUCTION

There has been a reported increase in the frequency and impact of disasters worldwide (Sobhani et al 2014). According to Annual Disaster Statistical Review (2015), in the year 2015, natural disasters once again had a devastating impact on human society. Worldwide, 376 reported natural disasters caused the death of 22,765 people, made 110.3 million victims and caused US\$ 70.3 billion damages ("Guha-Sapir D, Hoyois Ph., Below. R. Annual Disaster Statistical Review 2015: The Numbers and Trends. Brussels: CRED; 2016). The occurrence of disaster events has tripled over the past 30 years, and the number of people injured as a result of disaster events has tripled in this time (Sobhani et al. 2014). Disasters lead not only to the loss of life, human, material, environmental damage and the destruction of public infrastructures (Marin, 2015), but also result in an ensuing interruption in normal healthcare delivery, and the ability to respond appropriately to disaster victims (Al Khalaileh, 2012). Statistics showed that of the 1.35 million people killed by natural hazards over the past 20 years, more than half died in earthquakes, with the remainder due to weather- and climate related hazards (Centre for Research on the Epidemiology of Disasters, 2016).

Because of the widespread health impact of disasters to the affected community, nurses are often among the first health care workers providing care to the individuals who have been affected by the event (Tafreshi et al., 2007). As

the largest health workforce group nurses play a significant role in the healthcare response to disasters (Aliakbari et al. 2015).

METHODS

This paper reports on a part of findings from a descriptive qualitative study which was originally conducted in Iran in 2016-2017. The aim of the study was to explore nurse's perceptions of disaster competencies required by nurses based on their own experiences of working in a disaster

In total, 35 nurses with experience in disaster healthcare were selected using purposeful sampling. They all had experience in healthcare delivery following a disaster event in the past 10 years, either in a hospital or out-of-hospital context. There were a higher number of male participants in this study than females due to the fact that most of disaster operations in Iran are conducted by men. This might be related to the lack of female trained nurses to act in disaster situations as well as other contextual limitations. Events participants responded to include the Bam or Ahar earthquakes, flooding, and pandemic flu and all events were associated with high mortality.

The original research study was approved by both Ethics Committees of the Shahrekord and Isfahan University of Medical Sciences. Face-to-face semi-structured interviews were performed with each participant. Each interview was guided by the question "please tell me about your experience of working in a disaster?" Additional questions were used to further explore the experience of nurses and their perceptions of the competencies required by nurses in a disaster setting. Where further clarification was required, a second interview was arranged. Interviews were conducted over 40–100 min and were conducted in Persian by the principal author. Quotes included in this article have been translated by the author into English.

The interviewer was a female Ph.D. candidate in nursing. She was familiar with qualitative research

¹PhD, Shahrekord University of Medical Sciences, Shahrekord, Iran

²PhD, Nursing and Midwifery Care Research Center, Faculty of Nursing and Midwifery, Department of Adult Health Nursing, Isfahan University of Medical Sciences, Isfahan, Iran,

³PhD, Shahrekord University of Medical Sciences, Shahrekord, Iran,

⁴Department of Nursing, University of Social Welfare and Rehabilitation, Tehran, Iran Hamid.khankeh@ki.se

Correspondence to Dr. Fateme Ali Akbari. Email: payanname2016iran@gmail.com

methods and also in teaching disaster in nursing. She had theoretical classes and clinical training with nursing students in the past, but at the time of collecting the interview data, she did not have classes or training with any participant. All interviews were audiotaped. Participants were assured that their personal information and recorded materials would be kept confidential, and participants would remain anonymous in any publications resulting from the study.

Data were analyzed using thematic analysis conducted through five phases.²⁰ In the first phase, the author transcribed the data and took notes and marked ideas for coding. The next phases of analysis have been done by the authors. The second phase involved producing initial codes from the data by identifying interesting aspects in data items that might form the basis of repeated patterns (themes) across the data set. The third phase involved sorting the different codes into potential themes and collating the relevant coded data extracts within identified themes. In the fourth phase, we read all the collated extracts for each theme and considered whether they appeared to form a coherent pattern. Then, we considered the validity of the individual themes in relation to the dataset and whether our candidate thematic map "accurately" reflected the meanings evident in the dataset as a whole. In the fifth phase, we defined and further refined the themes (Lincoln & Guba 1985).

Participant recruitment, data collection, and analysis continued until data saturation occurred and a rich description of experiences was obtained. The data collection ceased after 35 interviews, as after 33 interviews it was clear that no new concepts had emerged. Confirmability, credibility, dependability and transferability were used to assure various aspects of trustworthiness according to Braun and Clarke (2006). For confirmability, the bracketing process put aside researchers' assumptions and biases before data collection. To assure credibility, we used peer debriefing or reviewing of data, codes and themes by a co-researcher, and member checking of findings by research participants. This was done with initial themes emerging from the data rather than the actual transcripts to increase the validity of the analyses. Focusing on the research objectives and trying to question the same areas for all the participants were used by researchers during the study to assure dependability. Nevertheless, generalisability is neither a claim nor a primary concern of qualitative research.

RESULTS

Management as it emerged from the participant experience encompasses the role of nurses managing patient care, human resource and logistics in a disaster response. The theme is further divided into two main sub themes. The first theme *disaster scene coordination* relates to the role of nurses in identifying and managing risks for staff and others present at the scene and the role nurses play in the needs analysis and acquisition of resources. This sub-theme has two sub categories - *psycho-emotional stress*

management and *scene safety*. The second main category; *human and other resource management* is about the required and available facilities, equipment and supplies and the ability to estimate required labor depending on the type and intensity of the incident. This main category also has two sub categories - *human and other resources* and *operational coordination*. The theme and categories are shown in Table 1.

Table1. Management competence: main categories and sub-categories
(Nursing management in disaster response)

Main categories	Sub category
Disaster scene coordination	Psycho-emotional stress management
	Scene safety
Human and other resources	human and other resource management
	Operational coordination

Disaster scene coordination: This theme is divided in to two sub categories. The first; Scene safety emphasizes the role of nurses in identifying and managing risks for staff and others present at the scene. The second theme; psycho emotional stress management describes the effect of stress and the need for nurse managers to be aware of this.

Psycho-emotional stress management: According to participants' experiences, psycho-emotional stress management included capabilities such as identifying the causes of stress, disaster intensity assessment, management abilities, stress management of co-workers, and the ability to manage the psycho-emotional impact of the disaster on casualties and others in the affected community. For example, participants described the extreme levels of psycho-emotional impact that accompany disasters and the need to understand and react appropriately in this situation:

A manager should notice that everyone is under stress ... they are under psycho- emotional stress, and try to identify what can cause stress in that situation, or aggravate (Participant 28, 7 years as an RN, involved in Bam earthquake).

Participants stated that those affected by disaster and their families suffer from severe psycho-emotional disequilibrium over time as described in the participant excerpt below:

Behavior with those who are injured and their families is very important and it can reduce tensions. There will be anger, evil curses.... (Participant 15, 12 years as an RN, involved in Khoramabad flood).

Combined with the chaos and disorganization that is characteristic of the immediate aftermath of disaster this can result in disruptive behavior and limited cooperation with relief efforts. Therefore, nurses must be able to recognize the causes of psychoemotional stress and adopt positive management strategies to alleviate the situation. This is a very complex and difficult task and many nurses have little experience in providing nursing care in communities under such strain.

In addition to the need for psycho-emotional stress management for those affected by disaster and their families, participants also discussed the effects of stress on their co-workers:

First, a manager should know what causes stress in staff. Then, assess individuals' stress level and react to them based on their stress level Because stress is just like (a) virus if you do not control it everyone would be over taken by it (Participant 1, 24 years as an RN, involved in Manjil Earthquake).

Scene safety: This sub-category refers to scene safety for both individuals who provide care and for others who are present at the scene of incident. This predominately relates to the out of hospital context such as temporary medical facilities or evacuation centers. Nurses describe the need to identify risks in this environment:

I think identifying risk factors in the scene is of great importance. It is even beyond doing anything else. Because if you do not pay attention that the ceiling may collapse as an example, and just want to sit there and revive your patient you would threaten the life of yourself and your patient (Participant 35, 18 years as RN, involved in War).

In addition to identifying hazards and assessing risk, nurses need to take action to manage the risks that have been identified so as to maintain the safety of nurses and patients.

... and when you discover hazardous factors, it is not enough to go out of the scene You should do something that helps others...(Participant 5, 9 years as an RN, involved in Rodbar earthquake).

It must be a manager in the scene that save the safety of staffs for physical contact that might be occur in the scene. It provides all the security they would not otherwise worked there. (Participant 19 worked 12 years as emergency nurse involved in Khoramabad flood).

Human and other Resources: Participants believed that managing resources was an essential nursing management competency for disaster relief. Resource management included two aspects: assessing the required and available facilities, equipment and supplies and the ability to estimate required labor depending on the type and intensity of the incident. Participants stated that after identifying what resources would be required a nurse should be capable of assessing the available resources and planning their use:

A nurse should have the skill to assess conditions have accurate assessments of available resources and facilities. Moreover, he/she should see what resources (are) needed to make a balance between these two (Participant 3, 12 years as an RN, involved in Bam earthquake).

Primary assessment of the incident means assessing the severity and depth of the incident for defining the number of required labor, which is an important skill that a nursing manager should have(Participant 25, 7 years as an RN, involved in Rodbar flood).

It means that he/she does not make decisions in a moment ...be prospective and understand that ... when so many victims are being rescued ... what services may be needed in the coming hours...(Participant 30, 16 years as an RN, involved in war).

Participants also emphasized skills and the ability to organize teams and individual nurses at the scene. While senior nurses may be experienced in the day-to-day management of staff and the provision of organized nursing

care; coordination of staff and care are challenging in the unusual context of disaster relief where few nurses have prior experience of working in austere and often extremely under-resourced environments. Participants discussed some of the strategies that they had employed to coordinate and manage resources:

One important task and ability of a nurse is to organize and coordinate staffing of nurses (Participant 16, 27 years as an RN, involved in Bam earthquake).

At the scene we have to find people who have not been injured and can do something and give them responsibilities based on their abilities ... we will do assessments and start to educate...(Participant 9, 14 years as an RN, involved in Borazjan earthquake).

Another characteristic of an effective manager ... was that he/she should promptly review capabilities, experience of the nurses (Participant17, 8 years as an RN, involved in and war).

The manager must see the glass half full and always try to provide the best conditions with minimum resource that has available (Participant 16, worked 22 years as emergency nurse, involved in Manjil and Bam Earthquake). According to participant's experiences in the present study, disaster management competence has two parts: scene management and human and other resources management. Stress management and security of scene lead to scene management competence and operational coordination and management of resources make human and resources management competence. Planning, division of labor and prediction of required action regarding to hazard type lead to maximum use of resources. All of these competences are required competences for disaster nurse that work as a manager in the scene.

DISCUSSION

This is the first study in Iran that has described the experience of nurses with management during disaster response activities. To some extent, the capabilities emphasized by participants in the study are complementary to the day-to-day management competencies of nurses. These capabilities have been highlighted because the extraordinary context in which disaster-nursing care occurs is unique and challenging and requires additional capabilities not normally possessed by nurses.

Psycho-emotional stress management was clearly an important capability in managing nursing care during disaster relief. Putra *et al.*, (2011) emphasizes the importance of psycho-emotional stress management and regards it as one of the important roles of general nurses in disaster management. Furthermore, Stanley *et al.* (2008) considered assessing the severity and psycho-emotional impact of the incident as critical capabilities of a nurse for scene stress management and this conclusion corresponds with the results of our study.

Another capability emphasized by participants, was safety at the scene of disaster, whether this was at the incident site or in damaged or temporary health care facilities. Participants stressed the importance of nurses being able to do rapid needs assessment and plan for the use of resources. To them, the ability to correctly assess

and prioritize the use of resources is an important aspect of a nurse manager's capability.

The ability to manage resources in the early phases of a disaster response, especially when few resources are available (Djalali *et al.*, 2011; Kondo *et al.*, 2009), as well as the need for proper evaluation of available resources, utilization of locally available resources, and identification of required external sources of support are all considered important (Polivka *et al.*, 2008; Motamedi *et al.*, 2009) and the results of this study concur with these findings. In addition, to the generic disaster nursing competencies established by the World Health Organization and the International Council of Nurses, one of the key capabilities of nurses in the relief phase identified by this study is management and proper coordination of the nursing workforce (WHO and ICN, 2009). Emergency medical response is one of the most important functions following a disaster event, aimed at limiting the loss of life. During the Bam earthquake, a large number of nurses were needed in order to provide emergency medical care (Djalali, 2011). Unfortunately these nurses did not have enough experience and there were a limited number of medical teams so this need was not met (Saghafi-Nia, 2008).

Participants stressed the importance of nurses being able to organize teams and individual nurses at the scene. Reports suggest that nurses need education and experience of managing and organizing other nurses to responding appropriately in disasters (Magnay *et al.*, 2011). This is particularly relevant in disaster situations where nurses may be working in a challenging environment dissimilar from their usual working environment. Additionally, clinical nurses not used to working in a management capacity may be required to take on management capabilities in this setting. Effective coordination is a critical factor in the response phase of a disaster and nurses have a crucial role in appropriate health care coordination in disasters (Vo *et al.* 2010; Motamedi *et al.*, 2009). Previous experiences of nurses working in critical situations in Iran show that nurses require specific knowledge and skills to act more effectively and with confidence. In another study which investigated the experiences of nurses during the disaster relief efforts of the Bam earthquake in 2007 in Iran it revealed that nurses were ill prepared and poor management of care by all medical personnel was noted. Additionally, nurses felt a general lack of knowledge and competence in every situation they confronted and a lack of coordination among responders resulted in many problems (Nasrabadi *et al.*, 2007).

The current study found a need for protocols, team work and education in disaster nursing. This situation illustrates how the gaps in knowledge of disaster nursing affect adversely on the ability of the nurse and how critical it is for nurses to have experience and competence to act as leaders. In the study reported here, participants emphasized some additional capabilities that nurses need in the extra-ordinary context of disaster relief. These are complementary to the day-to-day management competencies of nurses and can be used in the nursing education program in Iran.

These findings contribute towards identifying the skills and knowledge required to build effective emergency

disaster relief teams and to enable nurses to be more prepared to respond to critical situations. The management competencies complement existing nurse competencies in Iran, which currently have a biomedical focus (Memarian *et al.*, 2006). It is recommended that these competencies guide the development of a national disaster nursing program and be used to inform the design of education in disaster nursing. In the clinical context, these competencies may also provide a useful tool to determine whether a nurse has the knowledge, skills and abilities to function safely in a disaster situation, especially in health management in the relief phase.

CONCLUSION

This article presents an overview of the experience of nurses in relation to management roles undertaken during disaster response. There are few studies which explore this concept in Iran or further afield. The findings of this study demonstrate that nurses with experience in disaster relief report that specific management capabilities are required of senior nurses in addition to the clinical competencies that are required of all nurses responding in these situations. It is recommended that nurses participate in comprehensive educational programs to improve their disaster management capabilities. The findings of this study can be used as a guide for development of this educational program and will assist in building a common understanding of the coordination and management role of nurses. Further development of existing generic competencies with greater focus on coordination and management is also recommended.

This study has some limitations. It could be perceived that results of this study are not transferable to the wider nursing community due to differences in health systems and culture. However, in spite of this, knowledge gained from this research may still inform nurses responding to disaster and raise awareness around aspects of disaster management that nurses need to consider.

It has been 4 years since the study was conducted. While this could be perceived to be a limitation, no other research was found which has been conducted during this time on the same issue. Therefore the results of this study still have relevancy as they fill a gap.

Acknowledgements and Disclosures: The author acknowledges the participants who shared their experiences.

The author received financial support from both Shahrekord University of Medical Sciences and Isfahan University of Medical Sciences for this research project.

The author declare no conflict of interest

REFERENCES

1. AlKhalaileh, M.A., Bond, E & Alasad, J.A. (2012) Jordanian nurses' perceptions of their preparedness for disaster management. *Int. Emerg. Nurs.* 20, 14– 23.
2. Ali-Akbari F, Bahrami M, Aien F. Ethical and legal competence of nurses in disaster. *Journal of nursing ethics. Nurs Ethics.* 2015; 22(4):493-503.
3. Aliakbari F, Bahrami M, Aien F, Khanke H. Nurse's specific personal competences in disaster response: a qualitative study. *J Qual Res Health Sci* 2015; 4(2): 137-46

4. Arbon, P., Bobrowski, C., Zeitz, K., Hooper, C., Williams, J., Thitchener, J. Australian nurses Volunteering for the Sumatra Andaman earthquake and tsunami of 2004: A review of experience and analysis of data collected by the Tsunami Volunteer Hotline. *Australas. Emerg. Nurs. J.* 9,171-8.
5. Bergin, A., Khosa, B. 2007. Are we ready? Healthcare preparedness for catastrophic terrorism. *Aust. Strateg. Policy. Inst.* 2007,4, 1-19.
6. Centre for Research on the Epidemiology of Disasters.(2012). EM-DAT: OFDA/ CRED. Université catholique de Louvain. Brussels, Belgium. Available from www.cred.be.(Accessed: 5 May 2017).
7. Braun V and Clarke C. Using thematic analysis in psychology. *Qual Res Psychol* 2006; 3: 77–101
8. Centre for Research on the Epidemiology of Disasters.(2016). Poverty & Death: Disaster Mortality 1996-2015.
9. Chapman, K., Arbon, P. Are nurses ready? Disaster preparedness in the acute setting. *Australas. Emerg. Nurs. J.* 2008, 11, 135–144.
10. Djalali, A., 'et al.' Facilitators and obstacles in pre-hospital medical Response to earthquakes: a qualitative study. *Scand. J. Trauma., Resusc. Emerg. Med.* 2011, 19, 30.
11. Ellström PE, Hultman G, editors. Learning and changes in organisations. About pedagogy in working life. Lund: Student literature;2004.
12. Fung O, Loke A, Lai C. Disaster preparedness among Hong Kong nurses. *J. Adv. Nurs.* 2008, 62, 698i703.
13. "Guha-Sapir D, Hoyois Ph., Below. R. Annual Disaster Statistical Review 2015: The Numbers and Trends. Brussels: CRED; 2016."
14. Gunn, S.W.A. (2002) Multilingual Dictionary of Disaster Medicine and International Relief. Kluwer Academic Publisher Ltd, Boston.
15. Hassmiller , Susan B., Stanley Sharon A. R. Public Health Nursing and the Disaster Management Cycle . CHAPTER 23.pp: 507-531)
16. Hsu, E., 'et al.' Healthcare worker competencies for disaster training. *BMC Med Edu.* 2006, 6,19.
17. Kondo, H., 'et al.' Establishing Disaster Medical Assistance Teams in Japan. *Prehosp. Disaster. Med.* 2009, 24(6), 556–564.
18. Kvale, S., Brinkmann, S. (2009) Interviews. Learning the Craft of Qualitative Research Interviewing. SAGE Publications Ltd, Thousand Oaks, CA.
19. Lincoln YS, Guba EG. Naturalistic inquiry. Beverly Hills, California: Sage; 1985.
20. Loke AY, Fung OWM. Nurses' Competencies in Disaster Nursing: Implications for Curriculum Development and Public Health. *International Journal of Environmental Research and Public Health*. 2014;11(3):3289-3303. doi:10.3390/ijerph110303289.
21. Magnaye, B., 'et al.' The role, preparedness and management of nurses during disasters. *E Int. Sci. Res. J.* 2011, 3, 269.
22. Marin SM , Witt RR . Hospital Nurses' Competencies in Disaster Situations: A Qualitative Study in the South of Brazil . *Prehosp Disaster Med* . 2015 ;30 (6):548 -552 .
23. Mason, M. Sample Size and Saturation in PhD Studies Using Qualitative Interviews [63 paragraphs]. *Forum Qualitative Social for schung / Forum: Qualitative Social Research*, 2010, 11(3), Art. 8. <http://nbn-resolving.de/urn:nbn:de:0114-fqs100387>.
24. Memarian, R., 'et al.' Factors Affecting the Process of Obtaining Clinical Competency. *ZUMS J.* 2006, 14, 40-49.
25. Motamedi, H., Saghafinia, M., Bafarani, A.H., & Panahi, F. A reassessment and review of the Bam earthquake five years onward: What was done wrong? *Prehosp. Disaster. Med.* 2009, 24(5), 453–460.
26. Nakhaei M, Khankeh HR, Masoumi GR, Hosseini MA, Parsa-Yekta Z (2016) Participation a Key Factor for Life Recovery After Disaster: A Grounded Theory Study in an Iranian Context. *Iran Red Crescent Med J* 18
27. Nasrabadi, A., Naji, H., Mirzabeigi, G., & Dadbakhs, M. Earthquake relief: Iranian nurses' responses in Bam, 2003, and lessons learned. *Int. Nurs. Rev.* 2007, 57(1), 13–18.
28. Polivka, B., 'et al.' Public health nursing competencies for public health surge events. *Public. Health. Nurs.* 2008, 25 (2), 159-165.
29. Pourvakhshoori N, Norouzi K, Ahmadi F, Hosseini M, Khankeh H (2017) Nurse in limbo: A qualitative study of nursing in disasters in Iranian context. *PLoS ONE* 12(7): e0181314.
30. Pourvakhshoori N et al. Nursing in disasters: A review of existing models . *International Emergency Nursing* 2017;31: 58–63 59
31. Putra, A., Kep, S., Petpichetchian, W. & Maneewat, K. Review: Public Health Nurses' Roles and
32. Competencies in Disaster Management. *Nurse. Media. J. Nurs.* 2011, 1, 1-14.
33. Saghafi Nia, M., Nafissi, N. & Moharamzad, Y (2008) Survey of Bam earthquake survivors' opinions on medical and health systems services. *Prehospital Disaster Med.* 2008 , 23(3), 263-268.
34. Salari, H., Esfandiari, A., Heidari, A., Julaei, H., Rahimi, S.H. Survey of natural disasters preparedness in public and private hospitals of Islamic republic of Iran (case study of shiraz, 2011). *Int J Health System Disaster Manag.* 2013, 1(1),
35. Shuang-shuang Xia, Bing-xiang Yang, Xiao-li Chen, Marcia A. Petrini, Susan A. Schory, Qian Liu. Application and effects of a disaster nursing simulation training for Chinese undergraduates. *Journal of Nursing Education and Practice* 2016; 6 (10): 8-15.
36. Si-MuLiXiao, RongLi, DanYang, Nai-Wei Xu. Research progress in disaster nursing competency framework of nurses in China. *Chinese Nursing Research*, 2016; 3(4): 154-157.
37. Sobhani, G., Khammaria, M., Hayati, R., Ravangard, R., Heydari, AR, Heydarvand, S. Investigation of the preparedness level of the hospitals against disasters in Bandar Abbas, Iran, in 2012. *J Pak Med Asso*, 2014, 64: 506
38. Stanley, S., 'et al.' The Explore Surge trail guide and hiking workshop: discipline specific education for public health nurses. *Public. Health. Nurs.* 2008, 25 (2), 166-175.
39. Streubert, H., Carpenter, D.R. (2011) Qualitative Research in Nursing: Advancing the humanistic imperative. Lippincott Williams and Wilkins Publisher Ltd, Philadelphia.
40. Tafreshi, M.Z., Pazargadi, M. & Abed Saeedi, Z. (2007) Nurses' perspectives on quality of nursing care: a qualitative study in from Iran. *International Journal of Health Care Quality Assurance.* 2007, 20 (4), 320- 8.
41. Vo, AH., 'et al.' University of Texas Medical Branch telemedicine disaster response and recovery: lessons learned from hurricane Ike. *Telemed. J. E. Health.* 2010, 16, 627- 33.
42. WHO (2008). Integrating emergency preparedness and response into undergraduate nursing Curricula. Retrieved http://www.who.int/hac/publications/Nursing_curricula_followup_Feb08 (accessed 5 May 2017).
43. Weiner, E., Irwin, M., Trangenstein, P., Gordon, J. Emergency preparedness curriculum in nursing schools in the United States. *Nurs. Educ. Perspect.* 2005; 26:334-9.
44. Yin, H., et al. Optimal qualifications, staffing and scope of practice for first responder nurses in disaster. *J Clin Nurs.* 2011, 21, 264–271.
45. Y. Wang, L. Cheng, N. Qin, J. Lei. Necessity of disaster nursing development and the preparation of nursing education. *J Qilu Nurs*, 3 (2013), pp. 47-48.