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Nurses' professional competences in providing care to the injured in earthquake: A qualitative study

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Abstract:

BACKGROUND: Iran has experienced an increasing number of earthquake disasters in the past three decades. Due to nurses' unique role as professional and volunteer responders in times of disaster, more information is required regarding the capabilities they need to provide more effective care during the crisis. The aim of this study was to identify professional capabilities needed by nurses to provide care to the injured of earthquake.

MATERIALS AND METHODS: The present study was conducted as a qualitative conventional content analysis, and data collection was carried out through 16 semi-structured and in-depth interviews with the nurses involved in providing care to the injured in the Kermanshah earthquake. The data were analyzed following Graneheim and Lundman's approach.

RESULTS: Data analysis led to the emergence of 427 primary codes, 10 subcategories, and four categories. The four categories included clinical competence (professional knowledge and clinical skills), personal competences (communication skills, resiliency, and creativity and innovation in providing care), ethical competence (commitment to ethics and professional responsibility), and essential skills in caring for the injured (skills in triage, psychological care skills, and skills in observation and monitoring)

CONCLUSION: The present study identified a wide range of professional capabilities required by nurses in disasters. Given that nurses do not acquire some of these specialized and technical skills during their education, it is recommended to enhance the professional capacity of nurses in disasters. In addition, special training programs in this field can be incorporated into the curriculum of nursing programs and in-service nursing education.

Keywords:

Earthquake, nurses, professional competence, qualitative study

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Introduction

Earthquake is one of the most destructive natural disasters and its frequency has increased by four times over the past 25 years so that 792 earthquakes have been recorded between 1987 and 2015.^[1] Iran is one of the top 10 countries in terms of number earthquakes so that 90% of the population is at the risk of earthquake.^[2] On the night of November 12, 2017, at 21:48 local time, a devastating earthquake measuring 7.3 on the Richter scale struck the region

near the Iran–Iraq border in the West of Iran.^[3] In this event, there were 620 deaths, 8,000 wounded, 70,000 homeless, 4,700,000 affected by it, and $\geq 12,000$ damaged buildings.^[4]

Following such disasters, a surge in the demand for health and therapeutic services happens.^[5] Health system employees including nurses are the largest group of providers of health cares who play a key role in responding to natural disasters.^[6] Their number one objective is to achieve to the highest level of possible health for

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individuals and the community affected by a crisis.^[7] To realize this objective, nurses need a high level of personal and professional capabilities during the crisis.^[8] Correct, timely, and proper nursing practices are the essential factors in survival, mortality decrease, and well-being of individuals in the aftermath of disasters.^[9] These factors are associated with the level of nurses' professional preparedness and competence.^[10] The professional competence of nurses defined by the International Association of Nurses includes critical thinking skill, technical skills, and the ability to communicate effectively.^[11] In overall, competence comprises the combination and application of knowledge, expertise, and personal abilities to carry out professional roles safely and ethically. Nurses should know the basic knowledge about health promotion, risk reduction, and disease prevention in disasters.^[12]

Studies have shown that the majority of nurses emphasize on the role of skillful and well-educated nurses' in critical interventions. In addition, nurses need to be equipped with required knowledge and skills for providing professional care.^[13,14] The inadequacy of nurses' skills and competency to play an active role and provide the necessary care to the victims of the crisis can result in exacerbating the problem and irreversible complications to victims and society.^[10] Therefore, nurses must gain professional and technical skills such as using the emergency equipment, triage, and providing psychological care to the victims of disasters before facing a crisis.^[15]

Nurses also need to know scientific information about critical conditions and events to take effective measures in crisis because the combination of knowledge and care skills provides the necessary competence to manage the crisis and to play an effective role in critical situations.^[16] The lack of competency can result in the unsuitable performance of nurses in caring victims of disasters. Therefore, determining the capabilities needed by nurses to have an efficient participation during crisis and identifying the gaps in their skills and knowledge before attending critical situations are essential.^[17,18]

Despite the key role of nurses in the face of crisis, there is a small volume of information about the essential professional skills for an efficient participation.^[19]

Previous studies have failed to comprehensively cover the required capabilities in nurses during crisis in Iran.^[20] To fill this gap, the present study was an attempt to determine the professional capabilities of nurses in providing care to the victims of the Kermanshah earthquake following a qualitative approach.

Materials and Methods

This study was a qualitative research that was carried out using qualitative conventional content analysis method. We purposively selected nurses with an experience of providing care to the victims of the recent Kermanshah earthquake. In our study, the interviews were continued to reach the saturation point, which was obtained by interviewing 16 nurses, but two additional interviews were performed to make certain that no new concepts were developed. To achieve the maximum variability, the participants were selected from several teaching hospitals affiliated with Kermanshah University of Medical Sciences and other provinces (Tehran, Tabriz, Isfahan, Shiraz, and Kurdistan in Iran). The location of the interviews was also selected on the basis of the participant's convenience to make them feel comfortable. The inclusion criteria for participants consisted of (1) having a direct role in providing care to the earthquake victims for at least 24 h in the region hit by the earthquake; (2) having at least 1 year of work experience in clinical nursing practice; and (3) willingness to participate in the study.

Data were collected using semi-structured, face-to-face, in-depth interviews performed from March to September 2019. Each interview would be started by a general question such as "Please tell me about your experience of providing care of injured in Kermanshah earthquake?" To gain clearer and in-depth information, probing questions such as "Can you give me an example of..?" "Can you explain it more?" asked. Each interview lasted between 30 and 82 min.

All interviews were recorded digitally with the permission of the participants, transcribed verbatim, and imported into MAXQDA software (version 10 R 160410; Udo Kuckartz, Berlin, Germany) for data management. Each interview was reviewed and analyzed by two authors, and the retrieved information became a guide for further data collection. Data collection and data analysis were performed simultaneously. To performance conventional content analysis, Graneheim and Lundman's proposed five steps were used. These stages included (1) transcribing the interviews and reviewing them several times with the purpose of reaching an accurate understanding of the entire written items; (2) extracting meaning units and primary codes; (3) summarizing and categorizing the semantic units and selecting a suitable label for them; (4) modifying the primary subcategories and categories by research team; and (5) selecting an appropriate subject that has the ability of covering the categories.^[21] To ensure the trustworthiness of the findings, we used the four criteria such as credibility, dependability, conformability and transferability.^[22] To increase credibility, the researchers

conducted member checks with participants during the process of data collection and analysis, and some changes were made if needed. Moreover, employing the peer-checking techniques and long-term and ongoing engagement with the data for supported credibility of the findings for dependability, the raw data, codes, and subcategories were saved for audit purposes, and all procedures of the study and details were noted and recorded. To establish conformability, the research team's collective opinions were included in all stages of data analyzing. The sampling with maximum diversity was used to enhance the transferability of findings.

Ethical considerations

The study was approved by the Research Council and Ethics Committee of Urmia University of Medical Science (IR.UMSU.REC.1398.042). The participants were briefed about the objectives and method of the study and ensured that their identity will remain confidential. They signed a written letter of informed consent. Their participation was voluntary and they had the right to withdraw from the study at any stage.

Results

The mean age of the participants was 34.12 ± 5.77 years, with a mean work experience of 10.75 ± 5.3 years. Table 1 indicates the participants' demographic information. After the data analysis, four main categories were extracted from the data: (1) clinical competence, (2) personal competences, (3) ethical competence, (4) and essential skills in caring for the injured [Table 2]. These categories with their subcategories have been explained below.

Clinical competence

One of the categories of professional capabilities of nurses during crisis was clinical competence, which

was found by the participants as highly important. This category falls into the two subcategories of professional knowledge and clinical skill.

Professional knowledge

Based on the experiences of the participants, having the professional knowledge to perform professional disaster care due to specific sensitivities is essential because they do not have access to the Internet or textbook and must already have this knowledge. For example, a participant stated that

"During the first night, the crush syndrome patients were managed properly so that none of the suffered kidney failure. That is because all the nurses had the knowledge about cares for the injured." (No. 14).

Clinical skills

The participants emphasized that during crisis, nurses need special clinical skills along with their professional skills to provide efficient and effective cares. One participant clearly said that "One of the injured had respiratory distress and there was no Emergency Trolley accessible. With the help of one of my colleagues we inserted a peripheral venous catheter into the mid line of cricothyroid membrane dent and oral ventilation was done mandern catheter" (No. 7).

Among the other skills that the participants noted were doing therapeutic measures such as first aids, providing care to patients at different age ranges, controlling bleeding, cardiopulmonary resuscitation (CPR), controlling air ways, treatment of shock, debridement and dressing, bandaging, and fixation. The majority of participants mentioned these skills.

A participant stated that "During life threatening emergencies, it is essential for the nurses to have

Table 1: Descriptive characteristic of the participants

Participant number	Age (years)	Gender	Education level	Ward	Working experience (years)	Lengths of stay (days)
N1	31	Male	BSc	Emergency	7	8
N2	40	Female	MSc	Internal	16	5
N3	34	Female	BSc	Emergency	9	7
N4	27	Male	BSc	ICU	5	11
N5	36	Female	BSc	Surgical	12	5
N6	32	Female	MSc	Emergency	9	13
N7	33	Male	BSc	Surgical	12	14
N8	41	Female	MSc	CCU	18	3
N9	36	Female	BSc	Internal	11	7
N10	39	Male	BSc	ICU	16	14
N11	26	Female	BSc	Emergency	4	9
N12	34	Male	BSc	Surgical	13	10
N13	47	Male	BSc	offices	22	15
N14	33	Male	MSc	ICU	8	7
N15	25	Female	BSc	Emergency	3	7
N16	32	Female	MSc	Emergency	7	12

ICU=Intensive care unit, CCU=Cardiac care unit, BSc=Bachelor of Science, MSc=Master of Science

Table 2: Theme, categories, and subcategories extracted from the data

Theme	Category	Subcategory
Nurses' professional competences in disaster response	Clinical competence	Professional knowledge
		Clinical skill
	Personal competences	Communication skills
		Resiliency
		Creativity and innovation in providing care
	Ethical competences	Commitment to ethics
		Professional responsibility
	Essential skills in caring for the injured	Skills in triage
		Psychological care skills
		Skills in observation and monitoring

adequate skills about CPR and opening air ways in pregnant women, children (the largest group of injured), and even the elderly" (No. 12).

Personal competences

Given the participants' statements, the nurses need special personal capabilities before attending critical situations. For this reason, their statements revealed the following subcategories.

Communicational skills

Any care service begins with a communication between care provider (nurse) and care seeker (injured). As the participants noted, communication skills are of the most important themes of personal capabilities of nurses during crisis.

This finding is highlighted in the following statement: "I tried to have good communication with victims and their companions. I tried to speak and listen to patients while doing different procedures (e.g., stitching and attaching splint). I made sure that I have an eye contact with them and did not limit myself to doing my task." (No. 2).

The majority of participants believed that nursing nature demands effective communication among nurses and all health personnel as well.

"Ability to communicate with colleagues, physicians, commanders, and other members of relief teams such as the Red Crescent and emergency medical services is essential for nurses" (No. 15).

Resiliency

Being in a chaotic situation like a region hit by earthquake needs readiness to adapt to the situation. Almost all of the participants believed that change in eating routine, continuous work shifts without rest time, lack of sleep, and working in hard conditions are some of the most important issues that nurses need to adapt to them.

Nurses' statements further illustrate this: "The nurses worked the first 36 h after the earthquake in open space without portioning or walls" (No. 13).

"None of the nurses have access to water and food during the first 24 h after the earthquake and during the following days, canned food was the only thing available" (No. 5).

"I remained in the hospital during the first week nonstop. There was no place for sleep and we only had a few minutes rest time to lie down on the ground" (No. 8).

Creativity and innovation in providing care

According to the participants, one of the subcategories of personal competence was showing creativity during the provision of care in critical situations. Lack of resources made the nurses to find creative solutions.

For instance, a nurse noted: "We used door flats as stretcher to carry the patients and used pieces of woods or cardboards as splint" (No. 4).

Ethical competences

The majority of participants highlighted the importance of ethical concerns in the process of providing care to victims as a key competence for nurses during disasters. This indicates their commitment to society and nursing profession, which lead to the following subcategories.

Commitment to ethics

Commitment to keep patients' secret, honesty, trustworthiness, respecting privacy of the injured, and respecting patients' beliefs were necessary for providing ethical care to victims.

Nurses' statements further illustrate this: "Due to excessive fatigue, I mistakenly injected insulin instead of diphtheria-tetanus. I immediately informed the physician when I realized the mistake. Because I knew hiding this mistake would cause irreparable harms to the patient and a guilty conscience to myself" (No. 16).

The interviews showed that trustworthiness was one of the main ethical principles emphasized by the nurses.

"A woman was saved after being under a collapsed building for six hours. She told me that this kid is the only thing left for her in the world and please take care of him. While I was busy with other patients, I kept an eye on the child's and my colleagues and I took turn looking after him until we delivered him to his family after three days." (No. 16).

Professional responsibility

Almost all the participants highlighted the importance of professional responsibility and commitment in providing

care to victims. The nurses showed that even in critical conditions, they keep their commitment to professional responsibilities.

One of the nurses said that "All the personnel were at the hospital in the night of earthquake despite the fact that they had lost their houses during the earthquake. Even the personnel who were at the hospital at the time of earthquake stayed at work while they had no news about their families in absence of telephone and mobile services" (No. 10).

Even the role of mother and wife did not prevent the nurses from performing their duties.

"There was this nurse in the hit zone who kept working and would check her husband and infant every few hours in a car and breastfed the child." (No. 1).

Essential skills in caring for the injured

The majority of participants noted that to work effectively during a crisis, nurses need essential skills to provide quality and acceptable service to the injured, as to the participants, the following subcategories were emerged.

Skills in triage

Based on the experiences of nurses, this skill has a crucial role in identifying the most urgent needs of the injured and distinguishing them from others to determine treatment priorities. They also considered skills in triage as one of the most essential skills needed by nurses and emphasized the necessity of education.

In this regard, the participants stated that "Prioritizing injured in critical situation is a vital task, all nurses need to pass a triage course to avoid unnecessary measures when resources and human forces are scarce." (No. 6).

Psychological care skills

Many of the participants confessed their lack of skills about providing care to victims under mental and spiritual pressures. They noted that this was a vital care vacancy in nurses.

One of participants honestly confessed that "There was this patient who had lost all his family members and he had attempted suicide three days after the earthquake. Unfortunately, none of us had any skills about mental health to support the injured and their families" (No. 3).

Skills in observation and monitoring

The participants believed that due to the lack of access to medical equipment, observation and monitoring were key skills for nurses during crisis.

One participant said that "During crisis, a nurse needs to check the patients thoroughly at the first glance. There

were no monitoring or pulse oximetry available for CPR. All we could do was to check the pulse, pupil size, blue skin, and chest movements" (No. 9).

Discussion

The professional capabilities of nurses in providing care to the victims of Kermanshah Earthquake were elaborated on. Data analyses yielded four main categories. The first main category was about clinical competence in providing care to the victims of earthquake, which was explained by subcategories such as professional knowledge and clinical skills. As the findings recommended, having professional knowledge in critical situations is one of the essential skills needed by nurses during crisis. This finding is consistent with Ali Akbari results, who emphasized on scientific knowledge in critical situations as a major competence in nurses.^[15] A study by Bahrami *et al.* showed that nurses need deep knowledge about crisis to provide a quality care to the injured.^[20]

Clinical skill is one of the main elements of clinical competence. The participants stated that nurses need skills such as first aids, bleeding control, air ways control, and CPR in critical situations. The recent findings are relatively similar to Yan *et al.*'s findings.^[14] Al Khalife and Ali Akbari *et al.* highlighted that all nurses need professional skills such as CPR.^[13,23] The second main category was about personal competences in providing care to the victims of earthquake, which was explained by subcategories such as communication skills, resiliency, and creativity and innovation in providing care.

According to the participants, communicational skills were the main personal competencies in nurses during crisis. Different studies have highlighted this as one of the professional capabilities of health teams in providing services in different situations including crisis.^[24,25] The participants noted that to play a role in crisis, a nurse needs to be flexible and ready for complicated and unseen situations like an earthquake. Titus showed that providing first aid services in hard and dangerous regions demand good health, resilience, and adaptability. Nurses in such situations should expect water shortage, cold, heat, noises, and the like.^[26] Shipman conducted a study in the USA and showed that flexibility and capability were the main traits of nurses during crisis.^[27] Creativity and innovation in providing care was another key parameter of personal competence of nursing role in crisis. Creativity and innovation was mentioned by Sloand' study on the earthquake of Haiti and Wenji's study on the earthquake of China as the key traits of nurses in proving care to the injured. Their findings are consistent with our participants' statement in the present study.^[28,29]

The third main category was about ethical competences as a valuable aspect of professional care in earthquake, which was explained by subcategories such as commitment to ethics and professional responsibility. The majority of nurses noted that commitment to keep patients' secrets and trustworthiness was one of the key requirements of ethical care during crisis. This was one of the main professional values for nurses, which is consistent with the ethical codes of nursing in Iran.^[30] In addition, the participants emphasized that professional responsibility during crisis is essential for nurses. The participants in study Ali Akbari *et al.* demonstrated their commitment to nursing by stepping beyond the requirements of their task description.^[31] Many schools of ethics state that unethical performance is worthless. It is essential, therefore, to gain the required skill and competence in making decisions in critical situations along with respecting patients' rights and ethical codes.

The latest main category was about essential skills in caring for the injured, which was explained by subcategories such as skills in triage, psychological care skills, and skills in observation and monitoring. The participants mentioned several skills as essential skills and one of them was triage skill. In agreement with the results, Firouzkouhi *et al.* show that triage is an important skill for nurses to manage critical situations such as disasters and they have to be competent in performing triage.^[32] In addition, another review showed that the triage skill in critical situation is an essential element of technical capabilities that nurses need to have to demonstrate a good performance in disaster situations.^[23] Another matter that was underlined about using skills in critical situation was psychological care skill, and the majority of participants highlighted the key role of nurses in providing mental health support to the injured and their family members. They noted that nurses need to gain the skills required to implement the mental health services in disaster situations. Denise argued that crisis creates disorder in psychosocial and mental condition of individuals. During crisis, nurses are expected to play the role of a psychologist and provide emotional services along with providing physical care.^[33] The participating nurses in Yan Li's study on the earthquake of China noted that mental health skills and knowledge are critically important, which they did not possess. They also mentioned that they had received no education about providing counseling services to the injured or their colleagues.^[34] Observing and monitoring skills in disaster situations was one of the main elements of professional competencies in nurses to solve patients' problems and evaluate the outcomes of taken measures. Shipman *et al.* noted that physical assessment and monitoring was one of the essential skills for nurses during critical situations.^[27] Yin maintained about Chinese nurses that observing and monitoring skills was

one of the main top professional skills for providing care in critical situations and nurses need to have adequate skills in this regard.^[35]

Conclusion

Acquiring professional capability needed to provide cares in critical situation is highly important. According to our findings, clinical competence, personal competences, ethical competences, and essential skills in caring for the injured are essential for all nurses who care for the injured in critical situations. The findings can be used as a guide to find eligible nurses for disaster situations, prepare nurses, and improve their professional performance in a wide range of professional fields.

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Conflicts of interest

There are no conflicts of interest.

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