Reflecting on the Challenges encountered by nurses at the great Earthquake in the West of Iran: A qualitative study

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Abstract

Background: in Iran, it has experienced an enormous number of earthquake disasters during the past three decades. Nurses are the largest group of health systems that play a crucial role in handling disasters. Therefore, this study was aimed to explore the nursing challenges to provide care to the injured patients of the earthquake of Kermanshah-Iran.

Methods: This study was conducted as a qualitative content analysis. Data collection was carried out through 16 semi-structured and in-depth interviews with the nurses involved in the care of the earthquake victims. Data were managed using MAXQDA software and analyzed by Graneheim and Lundman's approach.

Results: in this study, fourteen subcategories, and five categories have emerged from 453 codes. The categories were: (a) organizational and managerial challenges; (b) human resources; (c) infrastructure; (d) educational system; and (e) ethical challenges.

Conclusion: The results showed that nurses confronted with several challenges in the care of earthquake victims. It appears better educational management and planning of nurses, infrastructure reform, and establishment of a crisis team among national nurses are necessary to overcome the challenges.

1. Background

Earthquake is one of the most destructive natural disasters. Based on the international Emergency Events Database (EM-DAT), the rate of earthquakes is growing globally so that 792 cases happened within 1987 and 2015 [1]. As a developing country in Asia, Iran is one of the top 10 seismic countries in the world [2]. On the night of 12th of November 2017 at 21:48 local time, a devastating earthquake with magnitude 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 ≥ 12,000 buildings were damaged [4]. After a natural disaster incidence, a demand surge for health and treatment services takes place [5]. In this regard, the significance of nurses is obvious. Since nurses are usually involved in disaster response by being the biggest group of health care providers, they often work in complicated conditions with restricted supplies with more problems and challenges in their work ([6, 7]. Studies have shown that the nurses who provide care services to earthquake victims meet several challenges and shortages [8], personal and family safety concerns [9], health problem management [10], and moral issues [11] are some of them. Given the high risk of earthquakes in different regions of Iran, it is essential to have the fundamental insights and evidence that grounded from the nurses' experiences. This can be achieved using qualitative studies. Since the issues and difficulties confronted by the nurses in providing care to earthquake sufferers have not been examined comprehensively by the previous studies [12]. Therefore we tried to achieve a basis for programming and policymaking in health care systems to face critical situations, and the present study conducted to explore the nursing challenges to provide care to the injured patients of the earthquake of Kermanshah-Iran.

2. Methods

2.1. Design

This qualitative approach using conventional content analysis carried out in 2019. The content analysis is the interpretation of meaning to recognize codes, sub-categories, categories, and themes [13].

2.2. Sampling and study setting

We purposively selected nurses with an experience of providing care to the victims of the recent Kermanshah earthquake. In our study, the interviews continued to reach the saturation point, which was obtained by interviewing 16 nurses, but two additional interviews were maintained to assure that no new concepts have emerged. To achieve the maximum variability, the participants opted from several teaching hospitals affiliated with the Kermanshah University of Medical Science and other provinces (Tabriz, Tehran, Isfahan, Kurdistan, and Shiraz in Iran). The inclusion criteria for participants consisted of having a direct role in providing care to the earthquake victims for at least 24 h in the region hit by the earthquake, having at least one year of work experience in clinical nursing practice, and willingness to participate in the study. Nurses who were reluctant to enroll in the study excluded from the study.

2.3. Participants

A total of 16 participants (nine males and seven females) working in emergency, Surgical, Internal, Cardiac Care Unit, and intensive care units, and all had more than three years of work experience were enrolled in the study. Age ranged from 25 to 47 years (mean and SD: 34.12 ± 5.77 years). Work experience was from 3 to 22 years (10.75 ± 5.3 years). The majority of them were married. Five had an MSc degree, and the remaining participants held a bachelor (68.75%) who had no previous experience in disaster relief work (see Table 1).

Table 1
Descriptive characteristic of the participants

Participant No.	Education Level	Ward	Working Experience (Years)	Lengths of stay(days)
N1	BSc	Emergency	7	8
N2	MSc	Internal	16	5
N3	BSc	Emergency	9	7
N4	BSc	ICU	5	11
N5	BSc	Surgical	12	5
N6	MSc	Emergency	9	13
N7	BSc	Surgical	12	14
N8	MSc	CCU	18	3
N9	BSc	Internal	11	7
N10	BSc	ICU	16	14
N11	BSc	Emergency	4	9
N12	BSc	Surgical	13	10
N13	BSc	offices	22	15
N14	MSc	ICU	8	7
N15	BSc	Emergency	3	7
N16	MSc	Emergency	7	12

2.4. Data collection

For data collection, the corresponding author held Face-to-face, semi-structured, in-depth interviews, and written field notes with participants from March to September 2019. The times of interviews were within 30 to 82 min (61 min on average) and directed at the workplaces of nurses where it was possible to talk privately. Each interview started with questions regarding demographic data and followed by a general question such as "What challenges did you face when providing care to the injured"? To gain in-depth information, probing questions such as “Can you give me an example of..?”, "Can you explain it more?” asked. All interviews were recorded digitally with the permission of the participants, transcribed verbatim, and imported into MAXQDA software (version10) for data management. They were reviewed and analyzed by two authors, and the retrieved information became a guide for further data collection.

2.5. Data analysis

Data collection and data analysis performed simultaneously. Through conventional content analysis, Graneheim and Lundman's proposed five steps included: (1) transcribing the interviews and reviewing them several times to reach an accurate understanding of the entire written items, (2) extracting meaning units and primary codes; (3) summarizing and categorizing the semantics and selecting a suitable label for them, (4) modifying the primary subcategories and categories by the research team; and (5) opt an appropriate subject that can cover the category (14). Finally, all authors discussed the analysis and agreed on the findings.

2.6. Trustworthiness

To assure study trustworthiness, we considered four criteria throughout the study process: credibility, dependability, conformability, and transferability (15). The researchers performed member checks with participants during the process of data collection and analysis, and some changes were made if needed. Moreover, employing the peer checking, long-term and ongoing engagement with the data for supporting credibility of the study. Dependability was met by showing the documents, codes, and subcategories for audit purposes. The procedures and details were noted and recorded. To establish conformability, researchers shared reflective manuscripts on the research subject, permitting researchers to acknowledge prior experiences and understandings of the phenomena. Also, researchers conscientiously performed reflective thinking to bracket individual opinions and ways of thinking. The sampling with maximum diversity used to enhance the transferability of findings.

3. Results

Data analysis led to the development of five categories and fourteen subcategories. The categories that emerged from the data analysis included (1) Organizational and managerial challenges, (2) human resources (3) infrastructure (4) educational system, and (5) ethical. These categories and their subcategories have explained below (Table 2).

Table 2
theme, categories, and sub-categories extracted from data

Theme	Category	Subcategory
Nursing care challenges in earthquake	**Organizational and managerial**	1. Insufficient coordination and cooperation among health team members
		2. Lack of unity in command
		3. Inadequate Organizational Management
	Human resources	1.Weakness in provision of safety for the nurses
		2. Poor management of volunteers
		3. Lack of uniforms for health workers
		4. Nurses' concern for their own families
	Infrastructure	1. Communication disruption
		2. Vulnerability of local health facilities
		3. Difficult access
	Educational system	1. Nurses' poor knowledge in the field of disaster
		2. Lack of comprehensive training program
	Ethical	1. Ethical challenges related to prioritizing injured
		2.Ethical challenges due to lack of resources

3.1. Organizational and managerial Challenges

This category represents the participants' statements about the absence of a concentrated management and programming system and poor coordination among the organizations that provided services during disasters, which lead to the following subcategories:

3.1.1. Insufficient coordination and cooperation among health team member

The field hospitals available in the region have not affiliated with one specific organization. They established by different organizations and had various equipment with no coordination and arrangement among them. So, the financial and human resources did not work efficiently, and in many cases, continuity of services had stopped.

One participant clearly said that *"The field hospitals established by the army and the University of Medical Sciences were at different places. The army hospital was fully equipped and located away from the Sar*

Pol Zahab mobile hospital. However, nobody knew that it was there and for a simple chest x-ray we had to dispatch patients to Kermanshah by a helicopter" (P10).

Another participant mentioned: *"There were several medical teams in some places and rural areas in particular, while there were none in other places" (P5).*

3. 1. 2. Lack Of Unity In Command

The nurses who experienced the Kermanshah earthquake mentioned issues and challenges like inconsistency between the requested medicines and supplied items, several command authorities, and intervention by policymakers and state authorities. This indicates a lack of unity in command, which was an issue in providing services to the victims.

For example, a participant stated that *"In many cases, serums and medicines would be supplied by other provinces without supervision and need assessment so that the large supply of unrequired medicine would only limit our operation spaces" (P13).*

Another participant expressed: *"There were several authorities who had different strategies" (P1).*

3.1.3. Inadequate organizational management
The nurses highlighted chaos and overlaps of operation, the ambiguity of tasks, and conflict of interests among organizations due to the obscurity of roles indicate negligence of the importance of organizing.

A participant stated that *"The Red Crescent is not directly the medical team, but they had erected their tents inside the hospital and converted the space into a place for distributing baby formula, clothes… and it was not easy for us to tell if someone needed medical attention or not. They also intervened with nursing services and created more problems for the nursing personnel" (P13).*

3.2. Human resources

Challenges related to human resources was another main category highlighted in many interviews. The participants mentioned the lack of a protocol to identify and prepare the volunteers for receiving health care. This resulted in the waste of energy and loss of quality of nursing services. As to the participants, the following subcategories have emerged:

3.2.1. Weakness in the provision of safety for the nurses

The negligence of the physical and mental health of the nurses was an issue. The majority of nurses would work nonstop; however, there were no proper welfare facilities for them. This lowered productivity of the workforces. In this regard, the participants stated:

"Because of the severity of the damages to the region, our nurses had almost lost their spirit. However, the mental health of nurses was not important for anyone. The nurses were lost themselves" (P3).

“We did not have lavatory during the first 48 hours. There was no rotating work system or facilities for nurses, we had no place to sleep” (P15).

3.2.2. Poor management of volunteers

Negligence of the necessity of establishing teams and optimum use of the available forces, no list of the available skills, and inefficient distribution of relief forces lowered the efficiency of the personnel. This created a mess in terms of human resources and the provision of health service during the crisis. This finding has highlighted in the following statement:

“*There were many nurses from different provinces who were not put in use properly. The least they could do was to let the local nurses use vacation for a week to handle their personal affairs” (P7).*

Another participant expressed: *“Nursing students did not have any specific skills, they would gather around a bed trying to find a vein, but all they would do was causing more harm to the patient” (P2).*

3.2.3. Lack of uniforms for health workers

Failure to distinguish the personnel skills and proficiency (many did not have an ID card or a proper uniform) created space for the opportunistic so that it was not easy for care-seekers and authorities to find a professional caregiver.

One of the nurses said

“*Many nurses and physicians in the region did not have an ID card or a uniform. There was this guy who claimed to be a pediatrician and took medicines to villages nearby. Later we found that he was a welder” (P4).*

3.2.4. Nurses' concern about their own families

The first concern for the local nurses was their families and their safety that made a mental engagement for them and prevented to care of injured people appropriately. In this regard, the participants stated:

“First, you need to make sure about your own family; otherwise, the concern affects your work. How can I stay at work when I am not sure if my family is alive or not” (P4).

Another participant mentioned: *“My baby and husband were in the car outside the hospital. Every few hours I had to return to them to breastfeed my baby and then return to work. I was highly under pressure” (p8).*

3.3. Infrastructure

Another category extracted from the experiences was “challenges caused by infrastructure.” The findings showed that the participants encountered several challenges in this regard.

3.3.1. Communication disruption

Immediately after the earthquake, the telecommunication services in the region become halted so that communication for making arrangements to manage the crisis was a crucial challenge for the personnel.

A participant said that "The telephone service was off and mobiles were not working. It was hard to contact the province crisis control center and other relief centers" (P1).

3.3.2 The vulnerability of local health facilities

Chaos in primary medial aids, due to damages to the health infrastructure, power outage, and weakened the quality of services provided by the nurses. One of the participants noted: "*After the earthquake, almost all health care centers were out of commission. The staff would provide health service at the hospital yard (with cold weather) using their mobile light" (P14).*

3.3.3. Difficult access

Heavy road traffic due to the stampede and massive destruction on the streets near the hospital, in particular, was one of the causes of disorder in providing health care by nurses. In this regard, one of them stated that" *It was a real mess. Many injured had stuck on the way of the hospital, in the traffic one kilometer away from the hospital. We would have been more helpful if we had access to the injured" (P12).*

3.4. Educational system

The challenges of the education system was another main category found in the study. Interviews showed that nurses were not prepared to face disasters and had not received adequate education in this area, which leads to the following subcategories:

3.4.1. Nurses' poor knowledge in the field of disaster

Many of the participants acknowledged their lack of knowledge and skill for providing care to earthquake victims. They highlighted this as a critical care void in their profession and emphasized on the necessity of education. In this regard, the participants stated:

"*The nurses were not familiar with the protocols of carrying patient, safety, and flight physiology. They did not know how to carry patients by helicopter" (P8).*

Another participant expressed: *"Many of the injured had suffered crush syndrome; however, most of the nurses knew nothing about it" (P9).*

3.4.2 Lack of comprehensive training program

The nurses mentioned their lack of readiness, and they believed that it was due to a gap in the formal education system and in-service educations.

One participant highlighted this: "*We had no education about the crisis; all we had was a two-credit course in the BSc program" (P11).*

Another nurse expressed: *"Due to the lack of integrity and harmony in educational programs on crises, our nurses were not able to demonstrate their true capabilities during the crisis" (P6).*

3.5. Ethical

Almost all the participants mentioned the moral challenges of different kinds they had faced within providing health care to the earthquake victims. They had also found these challenges annoying. For this reason, their statements revealed the following subcategories.

3.5.1 Ethical challenges related to prioritizing injured

As revealed by the interviews, when the disaster is a hug in scale, the nurses face hard decision-making situations. In many cases, they have to make an unfair and unpleasant decision. In some cases, these decisions are about life or death. In this regard, the participants stated:

"*It was a very frustrating situation, it was not easy to decide which one should be visited first, that child, that adult or that elderly…." (P5).*

One of the participants noted: "One of the victims had apnea, so we needed resuscitation trolly, aftershocks would not stop, and the building was collapsing. It was not able to decide whether I should risk my life and go inside the building to fetch the trolley" (P11).

3.5.2. Ethical challenges due to lack of resources

During disasters, material and human resources scarcity are common. As a result, the staff is unable to provide all services during the disaster happenings. This would create specific moral dilemmas for the nurses. The nurses talked about their experiences about conflicts between their knowledge of standard performance and failure to meet the standard. This was a source of moral challenge for them.

One of the nurses stated: "*We had to use one forceps for several patients with cuts; I do not if our job was ethical or not…." (p14).*

Discussion

In this study, the experience of nurses regarding the challenges faced by providing care to earthquake victims has examined. After Semi-structured interviews and data collection, the analysis yielded five categories. The organizational and managerial difficulties were the main extracted categories. According to the participants, different organizations like the ministry of health, the Red Crescent, and other relief organizations were in charge of providing services to care-seekers. These organizations worked independently and had no coordination.

Pouraghaei et al. studied the Azerbaijan earthquake in 2012 and highlighted the lack of coordination among organizations as one of the main challenges [16]. Another study by Li et al. on the Sichuan earthquake in China, they pointed to the lack of collaboration among disaster relief teams and insufficient leadership. [17].One of the challenges of the modern age is the necessity of an integrated system to face the disaster.

The human resources challenge was another extracted category in this study. The participants highlighted issues like lack of welfare facilities for caregivers like accommodation facilities, nutrition, bathrooms, and negligence of the mental health of nurses. Other studies have reported similar concerns in nurses like personal safety, adequate food, water, and accommodations [18, 19]. Hugelius et al. noted that providing psychological support was one of the main elements in nursing services in the face of disasters [20]. Also, Salmani et al. In their study noted that volunteers' potential problems and their physical and mental status would meet during and after disasters. [21]. The participant mentioned ineffective call and distribution of relief forces in the regions hit by the earthquake, lack of uniform, and their concerns about the safety of their families. Studies on the Sichuan earthquake in China and the Bam earthquake have highlighted poor human resource organization as well [17, 18]. Although health and treatment personnel were present in the region, they were not known to officials and clients in the early days. In the Bam and Azerbaijan earthquakes, some of the volunteers did not have uniforms and ID cards [16, 18]. Providing dress to distinguish the health providers and the ranking is fundamental to handle the disaster.

Despite the valuable role of nurses in the earthquake region, they and their families received no mental, financial, and emotional support. Similar problems have reported in other studies [9, 16, 22]. Nursing Organizations can take steps in this regard by providing protection and support for nurses and their families during disasters as incentives for nurses. Such services solve the concerns in nurses and improve their capability to provide health services.

Another main category was infrastructural challenges. The participants had experienced several challenges in this field. Ardalan et al. reported that due to communicational problems and the demolition of three health centers and 89 local clinics failed to play a more practical role during the first phase of reaction to the Azerbaijan earthquake [23]. Infrastructure disruption after disasters has mentioned in several studies as a serious challenge [24, 25].

Another extracted challenge was about the education system. Many of the participants acknowledged the lack of skills and knowledge for providing health care in disaster and the absence of a comprehensive education program in this regard. A systematic review in 2017 showed that nurses were not ready to work during a crisis; most of the reviewed studies were from Asian countries [26]. Like many other countries, crisis nursing education would not develop in Iran, so nurses do not have the knowledge and skill to work in disasters due to lack of education [12]. Empowerment of nurses and the improvement of their awareness can be a significant step to provide timely and proper services to victims during disasters.

Theoretical and practical educations should be a part of the nursing program to improve the performance of nurses during emergencies.

Another category based on the experiences of nurses was moral challenges. Some of the participants mentioned situations full of ethical issues and that they had no education in this regard and morality in providing care to the victims while nurses being at risk, were discussed. These findings are consistent with other studies on nurses who helped earthquake victims and faced with moral challenges [9, 11, 27]. Studies have shown that a lack of resources and hard situations create moral challenges like whether or not washing equipment with drinking water is the right thing to do. Similarly, nurses in our study also reported such practices as using one forceps for multiple injuries [8, 28]. Moral preparedness of nurses who are the front line of providing care services during disaster neglected and they suffer the consequences of different professional and moral challenges afterward [9].

Limitations

Several limitations should be considered when interpreting the findings of the study. The study findings are a reflection of the experiences of a small group of nurses attending an earthquake zone in one province of Iran. Therefore, it must be generalized with caution. For this limitation, the participants have selected from different locations with maximum diversity. Despite providing rich information about the concept under study, the time gap between the actual experiences and the interviews could also cause concerns about the accuracy of the recollections.

Conclusions

The nurses faced several challenges in providing care to earthquake victims. Five main categories have extracted, and most important of them were human resources and education system challenges that need serious, efficient, and effective intervention to ensure better care services in similar situations in the future. Similar challenges had experienced in previous earthquakes like the Roudbar, Bam, and Azerbaijan earthquakes. Experiencing the same challenges in the Kermanshah earthquake indicates negligence in the authorities to solve these challenges. Given the crisis nursing status in Iran, better curriculum planning and implementation, revision of nursing curriculum, and establishing crisis nursing national team (professional pre-identified volunteers) are essential measures to improve the professional competence of nurses in the face of disasters.

Abbreviations

BSc
Bachelor of Science; MSc:Master of Science; ICU:intensive care unit; CCU:cardiac care unit.

Declarations

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Authors' contributions

All authors participated and approved the study design. AA and KM contributed to design the study, KM collected the data and analyzed by AA, AVR, BN, and HS. The final report and article have written by AA, KM, and AVR and all authors read and approved the final manuscript

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Availability of data and materials

Data are available by contacting the corresponding author

Ethics approval and consent to participate

The study approved by the Research Council and Ethics Committee of Urmia University of Medical Science (IR.UMSU.REC.1398.042). Before the interview, written and verbal information about the study was given and written informed consent was taken from all participants. Their participation was voluntary, so they had the right to withdraw from the study at any stage.

Consent for publication

The article does not contain any individual's details, therefore consent for publication is not applicable.

Competing interests

All authors declare that they have no competing interests.

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