

# Health Management in Disasters in Iran: A Qualitative Study

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## Article info:

Received: 03 May 2015

Accepted: 30 Jul. 2015

## Keywords:

Disaster, Health, Health management

## ABSTRACT

**Background:** Disaster management relies on the prediction of problems and providing necessary preparations at the right time and place. In this study, researchers intended to explore previous experiences of health disaster management.

**Materials and Methods:** This study conducted using qualitative content analysis method. Participants were selected purposefully and data were collected through interviews, observation, and relevant documents.

**Results:** Transcribed data from 18 interviews, field notes, and other documents were analyzed. In data analysis, “reactive management” was emerged as the main theme. It included some categories such as “exposure shock,” “nondeliberative relief,” “lack of comprehensive health disaster plan,” “lack of preparedness,” and “poor coordination in health service delivery” as well as contextual factors.

**Conclusion:** The results clarified deep perception of participants’ experiences about health management in disasters. The professionals and nonprofessionals’ emotion-based reactions and behaviors, if accompanied with deficiencies in planning and preparedness, can lead to ineffective services and aggravate the damages.

## 1. Introduction

The number of reported disasters and the extent of their impacts show that most disasters are inevitable, and with changes in the environment, resources, population, and so on, communities are increasingly affected by disasters [1, 2]. The health system plays a major role during disasters in reducing mortality and injuries, thus the first and foremost demand during disasters is consistent, integrated, accessible, and coordinated health services [3], which makes it the toppest agenda of disaster management.

Recently Iran has achieved considerable success in terms of emergency management in health sector, but many rooms for improvement are left and studies conducted in this area have mentioned the lack of a comprehensive plan for health in disasters and emphasized on preparation [3-8]. Since there is no room for trial and error in crisis management, it is important to be prepared for effective field performance and develop guiding protocols. The best strategy to minimize damages, losses, and sufferings to people in such situations is to take advantage of past experiences for the best performance in future disasters. In spite of increasing trend of related studies in Iran, adequate attention has not been paid to grasp participants’

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perceptions thus their experiences and main concerns at times of disaster have been remained obscure [3-5, 7].

Thus, researchers decided to conduct a qualitative study to explore people's experiences of health management in previous disasters in the area of health.

## 2. Materials and Methods

This study was designed based on qualitative content analysis, which is a suitable method when new areas are to be investigated in an explorative manner or if the area needs to be explored from a new perspective [9, 10].

The participants were selected by purposeful sampling [9] among those who were willing and be able to communicate with the interviewer, were affected by disasters, and had experience of receiving, managing, or providing health services in recent disasters in Iran such as earthquakes of Bam and Zarand in Kerman and Lorestan.

Participants were 18 individuals aged 28-57 years with 3 types of disaster experience (health care managers, health care providers, and receivers).

The main strategy for data collection was in-depth and semi-structured interviews beginning with general questions and gradually progressing to more specific ones. This kind of interview was appropriate because of its flexibility and depth for qualitative research [9, 10].

Each interview began with a broad question, e.g. "Could you explain your experiences regarding health care services after the earthquake?" or "Tell me about what happened after that incident for you as an injured person." "What was needed there after the disaster?" "How were these needs met?" And for policy makers and health care providers' questions such as "Could you describe if there was any problem for delivering effective health care?" and "Which issues were experienced by affected people after disaster?"

Complementary probing questions were added according to the reflections of each participant, concerning to prior experiences of disaster, perceptions of health care providers, and individual's needs.

Time and place of the interviews were determined by study participants. Interviews were conducted individually and recorded with the consent of participants, and after completion, transcripts were taken down verbatim. Duration of interviews, depending upon participants'

conditions and mutual agreement was between 40 and 60 minutes.

The number of participants determined by saturation [10], which means the researcher, concluded that collected data was repeated, new code was not developed or existing codes were not extended.

The transcripts of interviews along with field notes and other documents were analyzed using qualitative (latent) content analysis [11].

The analysis started by identifying units of meanings (extracted from the statements/transcript) that were essential to the participants' experiences. The codes were compared based on differences and similarities and sorted out into categories and subcategories and then were discussed within the research team. Afterwards, appropriate themes were extracted from the data [11].

### Data trustworthiness

To obtain rich and reliable data in this study, the researcher endeavored to use accurate selection of key informed participants, allocate sufficient time for interviews, and use different data resources (interviews, observation, and other documents), and memos. The researcher tried to establish a friendly relationship with participants, and conduct interviews in an appropriate atmosphere.

Triangulation of researchers in the research team helped take into account different perspectives when analyzing the data. Also, the researcher presented extracted codes and initial categories for member check by some participants and peer check by two faculty members who were not part of the research team.

### Ethical considerations

In this study, the following items were considered: obtaining necessary permission letters, explaining objective and process of the study to participants and obtaining their written informed consents, emphasizing confidentiality of data, complying with ethical principles in observation and recording of field notes. Participants at each stage of the research had the right to withdraw.

## 3. Results

In this study, 18 participants were interviewed. By examining codes, data were classified into 22 categories. Analysis of data led to extraction of a main theme, "reactive management" that included categories of "exposure

shock,” “nondeliberative relief,” “lack of comprehensive health disaster plan,” “lack of preparedness,” and “poor coordination in health service delivery” as well as a category of contextual factors.

### Reactive management

Occurrence of an incidence or a disaster is a tough experience that is accompanied by injuries and damages to lives, finances, health, and imposes huge stress and psychological pressure on the victims and other involved individuals. It shocks people, thereby, influences their response and behaviors. People’s way of confronting and success in disaster control, largely depends on planning and preparation. Based on experiences of study participants, “reactive management” is reactions and behaviors of professionals and nonprofessionals in response to a disaster and its impacts without any predeveloped plan, and includes subcategories of “exposure shock,” “non deliberative relief,” “lack of comprehensive health plan,” “lack of preparedness,” and “poor coordination in health service delivery.”

### Exposure shock

After disaster, particularly when it was very tragic, as expected, many people might lose their loved ones or suffer irreversible damages, and this would cause shock which is described by participants as unique and even the worst experience in their lives.

Once disaster strikes, people display a range of emotional reactions, they get perplexed, cry or get excited and try to rescue their loved ones despite of physical injuries. Participant No: 16 had this to say:

“Before the incident, my daughter was in my hug. When I realized my kid wasn’t with me, I tried to find her, my head was injured and I couldn’t move right hand. I moved tiles and bricks around me, and saw my daughter under the rubble. I got shocked.”

Accumulation of corpses and rubbles intensified people’s reactions. Survivors were crying and wailing besides dead bodies of their loved ones. These reactions emotionally provoke the locals to rush to the rescue. Because the first rescuers were relatives and locals, due to their reactive behaviors and lack of knowledge about correct rescue procedures, their actions are not only ineffective, but also cause further injuries to themselves and others. Participant No: 17, a man with spinal cord injury said:

“I was trapped under the rubble, and hurt my back, then neighbors came to pull me out, the first person was my neighbor, . . . instead of taking the rubble off my back first, they just pulled me out with whatever they could, suddenly I felt a sharp pain in my back.”

Disaster situation surprised the health personnel in the same way. In addition they got confused more because of the increased work load. The influx of injured and their companions to hospitals caused excitement and fatigue in personnel which had reduced their efficiency.

### Nondeliberative relief

The rescue and relief teams with no predetermined plan of action, clear job description, and lack of necessary and sufficient facilities and equipment, crowded the area and caused more confusion and chaos among themselves and the injured. So they tried to do whatever they could. This unplanned presence, with no adequate equipment, not only reduced their efficiency, but also impaired coordination and available resources.

Also, due to lack of clear operational protocols and necessary equipment for correct removal and transportation of the rubbles and the injured, many of the injured people had to bear further damage. This performance portrayed a picture of inconsistency in rescue and relief operations.

### Lack of comprehensive health plan

Although participants stressed the developing trend of health sector in crisis management, there were deficiencies in planning causing problems in the field which confused health care providers. For example, there was lack of planning to cover all walks of the society; there was no planning for groups with special needs such as mentally retarded children, orphans, and mental health patients. Participant No: 10, a social worker recalled:

“We faced some mentally retarded among survivors that we had no plans for them. We actually didn’t know what to do for them.”

Furthermore, long-term care such as rehabilitation services which is important to complete the emergency care was provided without a protocol. No planning for this care and overemphasizing the acute therapeutic approach of the healthcare system overlooked these services at the time of disaster.

Active screening programs helped identify the needs, service providing and follow-ups. Such programs were

necessary for victims who did not seek help, but they were run with delay. Therefore, most of the victims' needs were not met for a long time, and they could not return to their normal life.

### Lack of preparedness

Locals and the relatives are the first rescuers or responders in disasters. Meanwhile, their unawareness about observing safety and rescue measures aggravate the injuries.

On the other hand, health providers believed that lack of familiarity with such situations and impracticality of field exercise made the personnel unprepared for an effective and appropriate performance. Participant No: 9, a nurse said:

“Before this incident, we weren't familiar with these events. Many of my colleagues and I haven't heard of these concepts, we didn't know what to do in such situations, what's priority, what's right or wrong... so, we worked according to our judgment and what we thought was right.”

Many lay people and volunteer groups began to field experience and learning. Lack of preparedness caused not only ineffective service provision but also anxiety and distress for the providers. Participant No: 9, a nurse said:

“Many a time we didn't know what to do. There was no one to ask the right way. Sometimes we were totally confused. I thought I was doing something good, but later I thought I would have done it better if I had known many things, maybe my services were better or I could have prevented many things.”

Coordination of many activities in the field needs preparation, so lack of preparedness causes interference in service provision, and duplication of efforts. Participant No: 10, a social worker stated:

“Everybody was busy with his affairs. We went to an area and saw many other groups had gone there and another region there was nobody. One didn't get any services for days, and another got more than enough services. We didn't know what each person was doing.”

### Poor coordination in health service delivery

Most of the participants emphasized the lack of coordination which affected the quality of providing services.

Unfamiliarity of the people with their teams made them unaware of their capabilities, and hence render inappropriate intragroup coordination.

According to the participants, other factors affected intragroup coordination, including poor team spirit and deficiencies in implementing duties on the basis of their determined positions.

The presence of different teams and volunteers made intergroup coordination harder and less. The groups did not have any prepared or in situ plans to familiarize and coordinate with each other.

Another factor that disrupted intergroup coordination was lack of a registration and central dispatching system. This condition impeded the flow of information transfer among the groups.

Lack of intragroup and intergroup coordination led to unclear roles within groups and functional conflict and duplication of efforts between groups.

The outcomes were inappropriate distribution of humanitarian affairs among needy people at a certain time and inappropriate use of resources. Participant No: 12, a physician said:

“At first, a patient could have, for example, two or three shots of dexamethasone by two nurses, or we saw a patient who got 3-4 shots of tetanus antitoxin... and a patient who got no shots.”

Another consequence was the disruption in transportation of patients and its subsequent problems on providing services, and hence on the health of the victims and their families.

### Contextual factors

Contextual factors were inhibitors or facilitators in disaster management which included characteristics and nature of the disaster, function of the infrastructure, the cultural context of the society, and accessibility and feasibility. These factors will be discussed in this section.

Some of the characteristics of event that participants mentioned were suddenness, extent, severity, type, and time of the incident.

The participants believed that suddenness of the event shocked most people, and produced emotional reactions. Furthermore, the intensity and depth of the disaster affects not only the type of emotional reaction, but also the qual-

ity of people's and system confrontation with the incident. Climatic conditions also affect the performance.

The functioning of the infrastructure, including health-care infrastructure and hospitals are important in providing, restoring, and maintaining people's health.

Destruction of hospitals not only causes problems in healthcare providing, but also induces lack of security and vulnerability in people. They get confused about transferring patients. Participant No: 8, a father in disaster area said:

"Hospital is very important for a city. When you have a patient, you go there. When the hospital itself is like that, then what? If gold rusts what then can iron do? When people reached the hospital, they were horrified to see its ruins."

The culture was emphasized by most participants, as an important factor in decision making. The cultural context affects the reaction to crisis, disaster coping strategies, and family life management. Participant No: 14, a survivor of disaster said:

"I had a friend that I talked with on the phone. She said: 'I don't know what to do; should I commit suicide?' she felt guilty that her kids were dead and she is alive. I asked her to go to a psychologist, but she turns it down because she fears her mother-in-law might say she is crazy, so her husband can happily get married with another woman.... She said: 'No, I don't want our relatives know about it'... people think like this."

Participants mentioned problems in transporting the injured, which affected the quality of the services and ultimately people's health. Participant No: 7, a physician said:

"When there is no plan for transferring patients, treatment will happen by chance, I mean, the patient who went to a good center was treated well. The one that went to a crowded hospital, they couldn't take care of them and mortality rate went up."

Also in the study of previous disasters, many considered difficult accessibility and feasibility to care centers as one of the most important reasons for lack of their follow up the treatment in different fields.

#### 4. Discussion

Based on our study results, the "reactive management" theme was extracted that included subthemes of "expo-

sure shock," "nondeliberative relief," "lack of comprehensive health disaster plan," "lack of preparedness," "poor coordination in health service delivery" as well as contextual factors.

All people impacted by a disaster are affected to some extent. Our results showed that an unexpected event exposes people with conditions that change their mental image of life instantly, and faces them to crises such as separation, loss, death of the beloved and relative, internal conflict, stress induced damage, loss of possessions, homelessness, etc.

People showed different types of reactions, ranged from confusing behaviors under the stress to obvious symptoms of phobia and hysteria, which were less common. Most people showed confusion and disbelief, and focused on survival and health of themselves and their beloved. In a phenomenological study by Keene (1998) after Dakota flood, one of the main extracted themes was "shock and disbelief" in survivors. The participants remembered the disaster as an experience they had never had in their life [12].

Documents mention a range of physiologic, psychological, social, behavioral, emotional, cognitive, and spiritual post disaster reactions in survivors [13-15]. According to our results, the feeling of unity, cooperation and heroic behaviors increased immediately after disaster. Survivors did extra work to help relatives and others. The post disaster confusion leads people to emotion-based rescue behaviors. American Red Cross recognizes 4 phases of heroic, honeymoon, disillusionment, and reconstruction as emotional reaction to disaster [14, 16]. Primary after disaster reactions and behaviors in the present study conform to the heroic phase; such humanitarian and altruistic behaviors were observed in both survivors and rescuers [14].

As mentioned in the results, in this phase the level of activity was high, but the efficacy and quality of rescuing were low and more harmful, as in documents indicted, earthquake left a lot of victims with spinal cord injury in developing countries such as 240 cases in Bam earthquake in Iran, and 600 cases in Northern Pakistan earthquake in 2005. Rescuers, especially locals and untrained people who excitedly and anxiously try to rescue more people are unaware of fixating the spinal cord and the techniques of moving people. Victims are pulled out of the rubble, moved and transferred without fixating spinal cord [17-19]. Evidently, the first rescuers should be sufficiently trained about the importance of immobilizing and correct transferring of victims in order to prevent more injuries.

This study indicated that the rescue and relief without planning, preparation, and facilities incurred consequences such as confusion and poor coordination. In line with the results of this study, other studies in Bam disaster reported that participants had not received enough training about rescuing and treating in disasters [8, 20]. Based on the results of this study, lack of trained and prepared teams for services, and lack of standard operational protocols had caused problems for rescuing and transferring the victims and increased the likelihood of injuries. Djalali (2011) recognized lack of Disaster Medical Assistance teams as an obstacle in providing prehospital services during disasters in Iran [4]. Absence of such trained and prepared teams during the acute post disaster phase can delay treatment services, transfer of the victims, and affect triage [4, 21].

From health perspective, disasters cause extensive and serious damages in a short time, and impose huge pressure on healthcare centers. Therefore, planning should be done, measures should be taken, and resources should be allocated to make sure that effective services would be available [7, 22]. In this study, participants emphasized the disaster planning too. Khankeh et al. (2006) emphasized the health management, and absence of a comprehensive plan, overlap and interference in providing services which indicate problems in health management [7]. A comprehensive plan would not only save lives, but also reduce the sufferings and enable an effective use of the available resources [4]. Djalali (2011) also reported lack of a disaster management plan as the main obstacle to the medical response to earthquake [4]. This issue does not just happen in Iran. Bayntun in a systematic review of papers published after 2000 concluded a holistic health system approach to disaster management, which supported by the resolution passed at the World Health Assembly in 2011. This approach aims to build a resilient health system to protect immediate and long-term population health in the face of disasters [23].

A comprehensive plan is needed to cover all needs and opportunities before, during, and immediately after the disaster, as well as the long period of post disaster recovery [16, 24, 25]. The results of the study revealed that there was no planning for long-term and complementary care. In reports of other disasters, in spite of high mortality, disabling injuries, and long-term disabilities, rehabilitation care was marginalized in planning and response to disaster [26-29], also during emergency phase, such services were provided much less because of the therapeutic approach of the responders and lack of rehabilitation perspective [28, 30]. Meanwhile, these specialists can have positive outcome on health during all phases of the disaster [28, 31, 32]. Therefore, planning for these services should be

considered because even adequately developed services will face challenges without advance planning and preparedness [22, 27, 29, 33].

While responders are responsible not only for treatment and preventing further injuries, but also helping the community to rehabilitate, and achieve self-sufficiency, and improve living [24, 25, 34, 35]. However, the current study revealed that recovery phase has been less attended to in planning.

Any disaster needs preparedness [36, 37]. As the results showed, the first responders were family members, friends, and relatives. Although local people play an important role in the first response after the disaster, without training, appropriate equipment and specialty they put themselves and others at higher risk of injury [25]. Therefore, public preparedness is the base of preparation programs which empower the public in different activities.

The preparedness of healthcare providers is really important, so that their higher preparedness equals reduced disaster-related mortality and morbidity [36, 37]. However, this study indicated that the healthcare professionals were not sufficiently prepared for disaster, and their efficacy and quality of performance were low. Other studies confirm our findings in this regard [4, 7, 38, 39].

Care providers in this study said that they were not familiar with concepts of disaster and its management, and they had field experience/learning. Nasrabadi (2007), in his study on Iranian nurses' experience in Bam earthquake reported lack of preparedness in the participants. Furthermore, lack of knowledge and skills caused emotional distress in them while they were carrying out their duties [39]. The participants of the present study experienced the same, as well. They felt the anxiety and stress due to their inefficiency; therefore, it is essential to devise a preparation and training plan for the personnel. For example, in other studies it has mentioned that preparation programs empower nurses, and increases their confidence in response to disaster while lack of experience causes stress and fear [40, 41].

In this study, many participants recognized lack of guidelines for different situations. Such standard operating protocols in the field can reduce inefficiency and its subsequent consequences. Different studies have emphasized the importance of operational protocols and guidelines like professional protocols for transferring the victims and so on [28, 30, 39].

The participants of the present study mentioned lack of plan for managing groups with special needs. Such people have special needs and require special attention at different stages of disaster [13, 42-46].

Participants emphasized the importance of coordination in healthcare services delivery and poor intragroup and intergroup coordination. Khankeh (2011) studied challenges of healthcare providers during disaster using grounded theory method. He recognized lack of planning, poor organizational management, and coordination were the most important obstacles in this field. Accordingly, it was suggested that planning before disaster, organization, and coordination were vital factors for a successful response [3]. Poor coordination is one of the important problems mentioned in other disasters too. For example, different studies recognized coordination challenges in healthcare after tsunami 2004. Of the most important challenges was the multiple responders with different objectives and missions [47-50], emotion-based performance [50], and information sharing [47, 50].

Results showed that poor coordination in health care providers resulted problems in resource allocation, service delivery and victims' health. Similar to our results, Nasrabadi (2007) indicated that due to poor teamwork and poor coordination between groups, some victims received good healthcare services, and some were overlooked [39].

Based on the different documents, it is revealed that preparedness based on advance planning and providing coordination are important key factors for effective confrontation with disaster.

Regarding the contextual factors, the suddenness, extent, intensity, type, and time of incidence affects the people's confrontation and the reaction of the involved system. The experienced stress depends on the characteristics of the disaster such as its intensity, magnitude, extent, predictability, preventability, and controllability [13]. Suddenness shocks people more and cause serious emotional reactions. Furthermore, this study revealed that the intensity and depth of the disaster not only affected type of emotional reactions, but also affected the quality of the confrontation by people and the system. Therefore, countries at risk of disaster should plan in advance for the services [3, 21, 22, 23] because the available services might not be able to respond efficiently.

The infrastructures can affect people's health [24], given the theory of the systems, and due to the dependence and relationship between systems, they affect each other too. When part of a system is destroyed or changes after a di-

saster, it affects other systems, including human systems [51]. The results of the present study revealed that hospitals play an important role in terms of not only providing health but also creating the feeling of security or vulnerability in people.

The results indicated that family and community culture was the effective factors in disaster exposure and recovery. These cultural factors affect choosing the strategies for individual adjustment and family and marital management. For example, culture can affect social relationships, expecting support and as a result, recovery after the disaster [52-54]. In this study, health management during disaster was studied. The study revealed a clearer picture of people's experiences with a deeper understanding of their experiences.

"Disaster exposure" was depicted, and the concept of "reactive management" was used for the first time in this study. This study revealed that emotion-based reactions and behaviors of professionals and nonprofessionals, if they are accompanied with deficiencies in planning and preparedness can lead to ineffective services, and aggravate the damages. Such exposure behaviors in this study were defined as "reactive management to disaster." Some effective factors such as contextual factors have been reported, too.

We hope that this study pave the way for the better, quicker and more effective disaster management.

Finally, it is recommended that a study be conducted with grounded theory approach to investigate the process of healthcare service in response to disasters.

### Acknowledgments:

The authors wish to thank all participants for their support and involvement in this study. We express our deep appreciation to the people affected in recently earthquakes, including people of Bam, Zarand, and Lorestan for their contributions to this study.

### Authors' Contributions

Maryam Nakhaei and Hamid Reza Khankeh conceived and designed the study, and collected the data. Gholam-Reza Masoumi assisted in the study conduct and data collection. Mohammad-Ali Hosseini and Zohreh Parsa-Yekta participated in data collection and analysis. All authors participated in data analysis and interpretation. Maryam Nakhaei drafted the manuscript and all authors contrib-

uted to its revision. All authors take responsibility for the paper as a whole.

### Conflict of interests

The authors declared no conflict of interests.

### References

- [1] Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters [Internet]. 2005; Available from: <http://www.unisdr.org/wcdr>.
- [2] Guba-Sapir D, Femke V, Below R, Ponserre S. Annual Disaster Statistical Review 2010: The Numbers and Trends [Internet]. Ciaco Imprimerie, Louvain-la-Neuve (Belgium) 2011; Available from: [http://www.cred.be/sites/default/files/ADSR\\_2010.pdf](http://www.cred.be/sites/default/files/ADSR_2010.pdf).
- [3] Khankeh HR, Khorasani Zavareh D, Johanson E, Mohammadi R, Ahmadi F, Mohammadi R. Disaster health-related challenges and requirements: A grounded theory study in Iran. *Prehospital and Disaster Medicine*. 2011; 26(3):1-8.
- [4] Djalali A, Khankeh HR, Öhlén G, Castrén M, Kurland L. Facilitators and obstacles in pre-hospital medical response to earthquakes: a qualitative study. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine*. 2011; 16:19:30.
- [5] Djalali A, Hosseinjenab V, Hasani A, Shirmardi K, Castrén M, Öhlén G, et al. A fundamental, national, disaster management plan: An education based model. *Prehospital and Disaster Medicine*. 2009; 24(6):565-569.
- [6] Ardalan A, Masoomi GR, Goya MM, Ghaffari M, Miadfar J, Sarvar MR, et al. Disaster Health Management: Iran's Progress and Challenges. *Iranian Journal of Public Health*. 2009; 38(1):93-97.
- [7] Khankeh HR, Mohammadi R, Ahmadi F, Maddah SB, Ranjbar M, Khodaei M. [Health Management in Natural Disasters (Persian)]. *Journal of Rehabilitation*. 2006; 7(2):49-55.
- [8] Motamedi HMK, Saghafinia M, Bafarani AH, Panahi F. A reassessment and review of the Bam earthquake five years onward: What was done wrong? *Prehospital and Disaster Medicine*. 2009; 24(5):453-460.
- [9] Streubert HS, Carpenter DR. *Qualitative Research in Nursing*. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2007, pp: 20-71.
- [10] Polit DF, Beck CT. *Nursing Research Principles & Methods*. 7th ed. Philadelphia, Penns: Lippincott Williams & Wilkins; 2007, pp: 26-578.
- [11] Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*. 2004; 24(2):105-12.
- [12] Keene EP. Phenomenological study of the North Dakota flood experience and its impact on survivors' health. *International Journal of Trauma Nursing*. 1998; 4(3):79-84.
- [13] Koenig K, Schultz CH. *Disaster Medicine comprehensive principles and practices*. New York: Cambridge University Press; 2010, pp: 103-130.
- [14] Veenema TG. *Disaster nursing & emergency preparedness for chemical, biological & radiological terrorism & other hazards*. 2nd ed. New York: Springer Publishing Company; 2007, pp: 81-100.
- [15] Norris FH, Friedman MJ, Watson PJ, Byrne CM, Diaz E, Kaniasty K. 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981-2001. *Psychiatry*. 2002; 65(3):207-39.
- [16] Ursano RJ, Fullerton CS, Weisaeth L, Beverly R. *Textbook of Disaster Psychiatry*. New York: Cambridge University Press; 2007, pp: 7-205.
- [17] Priebe MM. Spinal cord injuries as a result of earthquakes: lessons from Iran and Pakistan. *Journal of Spinal Cord Medicine*. 2007; 30(4):367-8.
- [18] Rathore MFA, Rashid P, Butt AW, Malik AA, Gill ZA, Haig AJ. Epidemiology of spinal cord injuries in the 2005 Pakistan earthquake. *Journal of Spinal Cord Medicine*. 2007; 45(10):658-663.
- [19] Mirhashemi S, Ghanjal A, Mohebbi HA, Moharamzad Y. The 2003 Bam earthquake: Overview of first aid and transport of victims. *Prehospital and Disaster Medicine*. 2007; 22(6):513-516.
- [20] Saghafinia M, Araghizade H, Nafissi N, Asadollahi R: Treatment management in disaster: A review of the Bam earthquake experience. *Prehospital and Disaster Medicine*. 2007; 22(6):517-521.
- [21] Kondo H, Koido Y, Morino K, Homma M, Otomo Y, Yamamoto Y, Henmi H. Establishing disaster medical assistance teams in Japan. *Prehospital and Disaster Medicine*. 2009; 24(6):556-564.
- [22] Eldar R. Preparedness for medical rehabilitation of casualties in disaster situations. *Disability & Rehabilitation* 1997; 19(12):547-51.
- [23] Bayntun C. A health system approach to all-hazards disaster management: A systematic review. *PLoS Currents*. 2012; 4:e50081cad5861d. doi: 10.1371/50081cad5861d.
- [24] Phillips BD. *Disaster Recovery*. Boca Raton (FL): Taylor & Francis Group; 2009, pp: 22-95.
- [25] Coppola DP editor. *Introduction to international disaster management*. Oxford: Elsevier Inc; 2007.
- [26] Raissi GR. Earthquakes and Rehabilitation Needs: Experiences From Bam, Iran. *Journal of Spinal Cord Medicine*. 2007; 30(4):369-372.
- [27] Reinhardt JD, Li J, Gosney J, Rathore FA, Haig AJ, Marx M, et al. Disability and health-related rehabilitation in international disaster relief. *Global Health Action*. 2011; 4: 7191.
- [28] Rathore FA, Farooq F, Muzammil S, New PW, Ahmad N, Haig AJ. Spinal cord injury management and rehabilitation: highlights and shortcomings from the 2005 earthquake in Pakistan. *Archives of Physical Medicine and Rehabilitation*. 2008; 89(3):579-85.

- [29] Rathore FA, Gosney JE, Reinhardt JD, Haig AJ, Li J, Delisa JA. Medical rehabilitation after natural disasters: why, when, and how? *Archives of Physical Medicine and Rehabilitation*. 2012; 93(10):1875-81.
- [30] Tauqir SF, Mirza S, Gul S, Ghaffar H, Zafar A. Complications in patients with spinal cord injuries sustained in an earthquake in Northern Pakistan. *Journal of Spinal Cord Medicine*. 2007; 30(4):373-7.
- [31] Liu SG, Li JA, Wang HX, Wang BB, Xiao MY, Zhang X, et al. [Community based rehabilitation needs for the earthquake victims in Sichuan-Mianzhu (Chineses)]. *Chinese Journal of Physical Medicine and Rehabilitation*. 2011; 33:59-61.
- [32] Raisi GR, Mokhtari A, Mansouri K. Reports from spinal cord injury patients: eight months after the 2003 earthquake in Bam, Iran. *American Journal of Physical Medicine and Rehabilitation*. 2007; 86(11):912-7.
- [33] Haig AJ, Im J, Adewole A, Nelson VS, Krabak B. The practice of physical medicine and rehabilitation in subSaharan Africa and Antarctica: a white paper or a black mark? *European Journal of Physical and Rehabilitation Medicine*. 2009; 45(2):185-91.
- [34] Vale LJ, Campanella TJ. *The resilient city: how modern cities recover from disaster*. New York: Oxford University Press; 2005.
- [35] Campanella TJ. Longer view: urban resilience and the recovery of New Orleans. *Journal of the American Planning Association*. 2006; 72(2):141-6.
- [36] Khankeh HR. [Hospital preparedness in disasters (Persian)]. Tehran: University of Social Welfare & Rehabilitation Sciences Press; 2012, pp: 20-76.
- [37] Risk reduction and emergency preparedness: WHO six-year strategy for the health sector and capacity development [Internet]. 2009; Available from: <http://www.who.int/hac/techguidance/preparedness/emergency-preparedness-eng.pdf>.
- [38] Mehrabadi Z. [Evaluation of safety in selected hospitals of Tehran university of Medical Sciences in Disasters (Persian)]. *Homay-Salamat*. 2006; 5(16):11.
- [39] Nasrabadi AN, Naji H, Mirzabeigi G, Dadbakhs M. Earthquake relief: Iranian nurses' responses in Bam, 2003, and lessons learned. *International Nursing Review*. 2007; 54(1):13-8.
- [40] Qureshi KA, Gershon RR, Merrill JA, Calero-Breckheimer A, Murrman M, Gebbie KM, et al. Effectiveness of an emergency preparedness training program for public health nurses in New York City. *Fam Community Health*. 2004; 27(3):242-9.
- [41] Gebbie KM, Qureshi K. Emergency and disaster preparedness. *American Journal of Nursing*. 2002; 102(1):46-51.
- [42] Pinkowski J. *Disaster Management Handbook*. Boca Raton (FL): Taylor & Francis Group LLC; 2008.
- [43] Mori K, Ugai K, Nonami Y, Kirimura T, Kondo C, Nakamura T, et al. Health needs of patients with chronic diseases who lived through the great Hanshin earthquake. *Disaster Manag Response*. 2007; 5(1):8-13.
- [44] Hoffman S. Preparing for disaster: protecting the most vulnerable in emergencies. *UC Davis Law Review*. 2009; 42:1491-1547.
- [45] Chou YJ, Huang N, Lee CH, Tsai SL, Chen LS, Chang HJ. Who is at risk of death in an earthquake? *American Journal of Epidemiology*. 2004; 160:688-95.
- [46] Tharp AT, Constans JJ, Yin R, Sullivan G, Vasterling JJ, Rouse J, et al. Service provision in disaster preparation, response, and recovery for individuals with predisaster mental illness. *American Journal of Disaster Medicine*. 2012; 7(3):171-4.
- [47] Zoraster RM. Barriers to disaster coordination: health sector coordination in Banda Aceh following the South Asia Tsunami. *Prehospital and Disaster Medicine*. 2006; 21(1):s13-8.
- [48] Lee VJ, Low E. Coordination and resource maximization during disaster relief efforts. *Prehospital and Disaster Medicine*. 2006; 21(1):s8-12.
- [49] Parmar S, Lobb A, Purdin S, McDonnell S. Enhancing collaboration during humanitarian response: an interim report from stakeholders survey. *Prehospital and Disaster Medicine*. 2007; 22(5):414-7.
- [50] Oyegbite K. What have we learned? Coordination. *Prehospital and Disaster Medicine*. 2005; 20(6):471-4.
- [51] Laszlo A, Krippner S. *Systems Theories: Their Origins, Foundations, and Development*. In: Jordan JS editor. *Systems Theories and a Priori Aspects of Perception*. Amsterdam: Elsevier Science; 1998, pp: 47-74.
- [52] Norris, FH, Alegria, M. Promoting Disaster Recovery in Ethnic-Minority Individuals and Communities. In: Ritchie EC, Watson PJ, Friedma MJ editors. *Interventions following mass violence and disasters: Strategies for mental health practice*. New York: Guilford Press; 2006, pp: 319-342.
- [53] Hofstede G, Hofstede GJ. *Cultures and Organizations: Software of the Mind*. New York: McGraw- Hill; 2005, pp: 73-114.
- [54] Draguns J. Ethnocultural considerations in the treatment of PTSD: Therapy and service delivery. In Marsella A, Friedman M, Gerrity E, Scurfield R, editors. *Ethnocultural aspects of PTSD: Issues, research, and clinical applications* Washington DC: American Psychiatric Association Press; 1996, pp: 459-482.

