

Assessment of Disaster Preparedness of Hospital in Mamasani, Iran

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Introduction

Over the history, humans have always witnessed various natural and unnatural disasters disrupting their routine life and causing human, financial, economic, and social losses such that available resources cannot fulfill the needs.^{1,2} Disasters are less likely to happen but have a high impact. Despite numerous definitions for disasters, they refer to situations where a large number of injured and disaster-stricken people go to hospitals to receive medical facilities, and hospitals' preparedness is a special and vital condition in such a situation.³ Iran is one of the most vulnerable countries to disasters. Approximately, 31 out of 40 types of natural disasters occur in Iran.⁴ Iran ranks fourth for casualties in Asia after India, China, and Bangladesh.⁶ Despite the advancement of

Abstract

Background: Iran is among the top ten disaster-prone countries in the world because of its size, geographical location, and climatic diversity. Practically, the healthcare sector is an active part in disaster management and an integral part of the national health plan. This study aimed to determine the preparedness of the personnel to cope with natural disasters in Valiasr Hospital of Mamasani, Iran.

Methods: This cross-sectional study was conducted in Valiasr Hospital, which has 100 beds. Data were collected using a 210-item researcher-made checklist. For each target, six domains of equipment, human resources, structure, physical space, protocol, and performance charts were considered. Face and content validities were used to confirm the validity and reliability of the questionnaire.

Results: The results of this study showed that the support unit scored the highest (69.45 %), followed by the command and management (66.16%) and education units (66%), respectively. Security units (51%), transportation (41.47%), and evacuation (40%) received the lowest score, respectively.

Conclusion: The findings showed that the hospital under the study was in moderate level in preparedness for disaster. Improving the preparedness of hospitals for disasters will be possible with proper management of available resources and the use of update technologies.

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science and technology, we still cannot accurately predict many natural disasters. Therefore, these disasters may take place anytime and anywhere with any degree of intensity. Disasters result in a large number of demands for assistance, healthcare, and treatment within a short time due to their large extent, huge impact, the large population at risk, and limited capacity of responsible organizations. Moreover, disasters threaten all economic, political, and cultural infrastructures of the society. To deal with disasters, all facilities available in the society should be used, and each economic, political, and cultural infrastructure should deal with disasters within a crisis management plan and mitigate crisis as much as possible according to their responsibilities and limitations.^{4,7}

Appropriate reaction to disasters mandates

appropriate preparedness because each disaster is unique, and every hospital has its own conditions.⁸ The preparedness of hospitals is multidimensional involving medical limitations and other relevant items. Managers of medical institutes should know the risks, thus increasing the standards and power and reducing the risks of disasters.⁹ In this respect, hospitals need an operational program to be prepared against disasters and crises and minimize their impact.¹⁰ It can be argued that most countries have a management system called crisis management for natural disasters. This management system executively differs from one country to another. In general, the process of crisis management in every country roots in items, such as geography and natural climate, history of previous disasters, and degree of development of that country, which is directly associated with the systems found in that country.¹¹

Hussar stated that training programs on disaster preparedness can reduce the mortality of people injured by disasters; because training is the most efficient mechanism of the society for dealing with the biggest challenge of this century, the sustainable development can reduce many problems at the time of disasters.¹² Given that all service systems in crises emphasize healthcare and treatment, management of these systems is highly effective in making other social systems continue working and succeed.¹³ Furthermore, hospitals are known as the frontline of treatment and one of the most important places providing medical services. Therefore, the necessity of the hospitals being prepared against crises reveals the necessity for designing a regular program for dealing with expected and unexpected events in hospitals. Strengths, limitations, and weaknesses of every hospital should be determined in order to be able to raise their working power and standards and

consequently make them more prepared against events and reduce adverse effects of the events.¹⁴

In this respect, this study was conducted to measure disaster preparedness of Valiasr Hospital in Mamasani, Iran in 2014. Necessary information obtained on the current status, strengths, and weaknesses in this study may help the authorities plan different parts of the hospital crisis management.

Methods

Nourabad Mamasani is located at 51 degrees, 31 minutes east longitude and 30 degrees and 7 minutes north latitude.¹⁵ According to 2016 census in Iran, the population of Nourabad Mamasani is 117,000. This descriptive study was conducted to assess the level of disaster preparedness of the only hospital in Nourabad Mamasani in 2014. This study was performed in Valiasr Nourabad Mamasani Hospital with a large number of personnel and patients, but fortunately, the management and staff of the hospital cooperated well with the researchers of this project. The evaluation tools used in this study were based on a checklist published by the WHO in 2011.¹⁶ The data were collected using a checklist containing 220 (Yes / No) questions about different hospital units, including emergency ward, admission, transfer and evacuation, traffic and communications, security, training, support, human resources, and management (Table 1).

Hojjat et al. also have used this checklist and confirmed its face and content validity and reliability.¹⁷ In another study conducted in Sri Lanka, Munasinghe and Matsui also used this checklist.¹⁶

Once the researchers made arrangements, obtained the necessary permit, and explained the objectives of the study, they gave the checklist to the hospital's director;

Table 1: The maximum and minimum scores of preparedness of each unit separately in each section

	The minimum score	The maximum score
1- Checklist related to the emergency ward	- Presence of specific forms for admitting patients injured in events	A predetermined place for keeping equipment needed in emergency ward for times when it is expanded
2- Checklist related to the admission ward	A predetermined alternative place for the admission ward in emergencies	Predetermined personnel responsible for receiving personal objects, documents, and items of patients
3- Checklist related to the evacuation and transfer unit	Is there any documented plan for hospital evacuation?	Has the temporary accommodation of patients been determined?
4- Checklist related to the traffic unit	Has the priority for use of elevators been determined? (Injured people, personnel, etc.)	Has anyone been determined to be in charge of controlling the traffic inside the hospital?
5- Checklist related to the communications unit	Has the process of collecting and classifying information been determined?	Has anyone been determined to collect information during crises?
6- Checklist related to the security unit	Is there any instruction for detection and control of unfavorable elements?	Have closed-circuit television cameras been installed for control of the emergency ward?
7- Checklist related to the training unit	Have any instructional posters or placards been posted?	Is there any program for training about crises?
8- Checklist related to the support unit	Is there any program for collecting public donations?	Has anyone been determined for setting up emergency heating and cooling systems in crises?
9- Checklist related to the human resource unit	Is there any instruction for psychological consultation for the personnel involved in crises?	Has anyone been determined for supplying human resources (physicians, nurses, etc.) in crises?

Table 2: The percentage of preparedness for each studied unit in the hospital

Studied unit	Level of preparedness (%)	Level of preparedness
Support	69.45	Moderate
Command and management	66.16	Good
Training	66	Good
Human resource	65.08	Good
Admission	60.65	Good
Emergency	59.63	Moderate
Communications	55.56	Moderate
Security	51	Good
Traffic	47.41	Good
Evacuation and transfer	40	Good

administrative, and financial personnel; support managers; and the head of crisis committee. The data were analyzed using descriptive statistics. “No” answers were assigned zero point, and “Yes” answers were assigned one point.

To facilitate the comparison, the level of disaster preparedness of different hospital units was determined as very weak for the score of 0-19, weak for score of 20-39, moderate for score of 40-59, good for score of 60-79, and very good for score of 80-100.

Very good	Good	Moderate	Weak	Very weak
80 and higher	60-80	40-60	20-40	Under 20

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Results

The studied hospital had 12 clinical wards, 4 para-clinical wards, a clinic, and a crisis committee and can admit 220 injured people in critical situations. Table 2 shows the hospital's level of disaster preparedness for each unit.

As shown in The able 2, the support unit gained maximum score, and then, command and management unit and training respectively gained the highest scores. Evacuation, traffic, and security respectively gained the lowest scores. The score of disaster preparedness in different studied units of the hospital ranged 40-70 with a mean of 58.2 (SD=0.845) that was considered as moderate preparedness based on the specified criterion. In general, the hospital's disaster preparedness was assessed as 58.2% that was moderate based on the determined criterion.

Discussion

The hospital's disaster preparedness was totally assessed as 58.2%, showing moderate preparedness. The result was similar to that in Hojjat et al.'s study in which the level of preparedness of 13 selected hospitals affiliated to universities of medical sciences in Tehran was obtained

as 51.94%.¹⁷ However, there are different criteria and factors, including time, geographical conditions, type of disaster, probable number of patients, hospital's mission, and measurement instruments, which influence the assessment of the level of disaster preparedness of the studied units.¹⁸

The results of a study carried out by Munasinghe and Matsui at Matara District General Hospital in Sri Lanka (2019) showed that most salient aspects of preparedness, such as human resources, communication, safety, security, transportation, critical supplies, and morgue capacity were inadequate. Most of the respondents were unaware of the disaster response plan. Also, they had not participated in disaster drills.¹⁶

In unexpected events and in situations where routine decisions and activities are stopped and also when there are a large number of injured and victims, the minimum score and the moderate average are not accountable.¹⁹ Hospitals' preparedness is accomplished only through team work and cooperation of all elements of the hospitals.²⁰ In this respect, the hospitals' crisis committee can equip the hospitals and their units with primary instruments used to deal with disasters and train the personnel continually to be prepared and cooperate efficiently in this regard prior to other activities.

The score obtained for evacuation and transfer was moderate (40%) in the studied hospital, which was in the same line with the result (48%) of Salari et al.'s study,⁴ and this conformity shows that no certain action has been taken to improve the hospitals in this regard since then.

The results reveal that the place and other factors influencing preparedness affect the hospitals' performance. The hospitals' evacuation and transfer in disasters are necessary and important indicators of hospitals' disaster preparedness. Bazyar et al. obtained preparedness of the hospitals' transfer and evacuation unit as 44%, which was weak.²¹ Moreover, 33% of hospitals in a study conducted by Mohebbifar and Asefzadeh did not have an evacuation plan,²² and problems observed in most hospitals were related to

transfer and evacuation of patients and corpses and lack of periodical training for emergency evacuation. A complete list of the number of ambulances and other vehicles, such as stretchers and wheelchairs, should be prepared, and the priority of using these vehicles, allocation of fuel to them, and people responsible of these vehicles should be determined in order to be ready for transfer and evacuation in every hospital.

The communications unit of the hospital was of moderate preparedness (56%) that is more than the results that Mohabati et al. have reported in a study conducted in hospitals in Zabol. (31.57%) (31.57%).²³ Regarding the importance of communication and information systems during the crises and passage of time, it seems necessary to make plans for promotion of preparedness of that unit.²⁴

Another part involved in crises was the hospital's traffic unit that had a moderate level of preparedness (47.41%). In Mosadegh-Rad's study on the level of preparedness of university hospitals in Isfahan for responding people injured by disasters also obtained preparedness of traffic unit as 53%.²⁵ To control the traffic during crises and avoid problems with transfer of the injured people, it is necessary to provide instructions for the use of parking and communication equipment to the personnel controlling the traffic. The preparedness of the security unit of the studied hospital was moderate (51%), which was different from that of Hojjat et al.'s study in which preparedness of security unit was good (61.69%).¹⁷

Based on the results of this study, preparedness of the training unit was good (66%). The support unit of the hospital was well-prepared (69.45%) and better prepared than that (54%) in Mosadeghrad's study.²⁵ The result obtained in this study in this regard was similar to that (69%) obtained in Hojjat et al.'s study.¹⁷ Maximum preparedness was related to the support unit.

The preparedness of the human resource unit was good (65.08%) unlike Sobhani et al.'s study in which preparedness of the human resource unit was 38.6%.²⁶ In another study conducted by Bazyar et al., this factor was moderate (52%). Better results can be seen in a study conducted in Tabriz hospitals with 77% of human resources.²¹ In general, preparedness of the crisis management was moderate. Managers in medical centers should acquire necessary information on crisis management to act well in crises and play their role as well as possible. The incidence of emergency conditions, loss of composure, and risks of unorganized population necessitate making management plans for medical centers.²⁷⁻²⁹

The results of another study conducted by Bazyar et al. showed that preparedness for hospital's admission was low (31.65%) compared to this study

that was moderate (60.65%).²¹

This study showed that doctors, nurses, and other staff at Valiasr Mamasani Hospital have little knowledge about the disaster preparedness. Hospital administrations are usually given little attention to the issue of disaster safety due to budget constraints. Other limitations and problems in disaster preparedness at Mamasani Hospital include lack of proper policy, poor legislation, lack of specialists and technical problems.

Conclusion

The command and management, emergency, support, training, human resource, and admission units of the studied hospital were not good at preparedness, and communications, security, traffic, and evacuation and transfer units had moderate preparedness. Based on the assessments performed in this study, preparedness of the studied hospital was totally moderate within the scale used in this study. Given these results, it is necessary for the managers to pay attention to the qualitative increase in disaster preparedness, which is achieved through education and training. In addition, people's personal attribute must be developed through experience and reinforced by personal belief and self-assurance.

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