Journal of Disaster & Emergency Research
http://jder.ssu.ac.ir
eISSN: 2588-6150
2020; 3(1): 33-39
10.18502/jder.v3i1.2566

Determining the Level of Preparedness in Yazd Shahid Sadoughi Hospital for Confronting to Emergencies and Disasters after Development of Hospital Disaster Response Plan

Mohammad Ali Jafari [1], Reza Farahmand Rad [2], Akram Zolfaghari Sadrabad [2], Mohammad Reza Haghighi [3]*

[1] Department of Emergency, Shahid Sadoughi Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[2] Clinical Research Development Center, Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran
[3] Department of Emergency, School of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

ARTICLE INFO

ORIGINAL ARTICLE

Article history:
Received: 10 March 2019
Revised: 2 Nov 2019
Accepted: 28 Dec 2019

***Corresponding author:**
Mohammad Reza Haghighi

Address:
Department of Emergency, School of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Email:
Drrezahaghighi1366@gmail.com

Tel:
+98-9133578389

ABSTRACT

Introduction: According to the importance of preparation of health care facilities against incidents and disasters, the aim of this study is to determine the level of preparation of Yazd Shahid Sadoughi Hospital for responding to incidents and disaster after the Development of a hospital disaster-response plan.

Methods: This cross-sectional, descriptive study has investigated the level of vulnerability of the hospital against incidents and disasters and has identified the hazards threatening the Yazd Shahid Sadoughi Hospital in 2016. The used tool was the Farsi Hospital Safety Index (FHSI) questionnaire in three scopes of functional, structural and non-structural and the results were analyzed using the Excel software.

Results: The results showed that the frequency of natural disasters in hospital was about 48%, functional safety level of about 56.39%, non-structural safety level was about 53.33, structural elements safety level was about 73.33, the score of weighted safety was about 63.94%, and the score of safety without weighing was about 56.41%.

Conclusion: According to the results, it could be concluded that the amount of preparation of the hospital is in acceptable level and by developing a disaster response plan, the level of preparation of Yazd Shahid Sadoughi Hospital to confront the incidents and disasters could be improved, especially in structural and functional vulnerability sections.

Keywords: Hospital Preparation, Health care Facilities, Hospital safety Index

Introduction

Nowadays, the complications, injuries, and expenses due to emergencies and disasters have significant and undeniable effect on lifestyle and health of human in such a way that its destructive effect disturbs the capability of a society to provide its basic needs and can result in the death, injury or affecting lots of people (1). The negative effect of an event destroys the capability of a society to provide its needs (2). Considering to frequency of emergencies and disasters, they are very destructive and affect the health care systems by great amount of injured people. It should be mentiuoned that, these effects could be continued for a long time after the occurring any disasters (3).

During the disasters and emergencies, health care centers are act as frontline sectors which their optimized and on-time health services can have a vital effect to reducing number of injured and lost

This paper should be cited as: Jafari MA, Farahmand Rad R, Zolfaghari Sadrabad A, Haghighi MR. **Determining the Level of Preparedness in Yazd Shahid Sadoughi Hospital for Confronting to Emergencies and Disasters after Development of Hospital Disaster Response Plan.** Journal of Disaster & Emergency Research. 2020; 3(1): 33-39.

lives (4). Also, applying the efficient management of health care centers in case of an disasters has a great effect on the appropriate performance of these organizations (5).

Lack of planning and organizing to confront the disasters, and lack of proper training of the staff for disaster management can have irreparable costs for the health care systems (6). Therefore, it is necessary for a hospital to be prepared in terms of structure, non-structure, and performance so it could continue its services without any disruption (7). Determining the level of hospitals preparation is an inevitable step for reducing hospitals risks. Hospital safety index is a useful and widely used tool, presented by the world health organization which determine the level of hospital preparedness through the assessment of structural, non-structural and functional criteria (8, 9).

Considering the location of Yazd province in the communication route of southern cities to the middle and northern cities of Iran, is vulnerable to man-made disaster, specially road traffic accidents.

Shahid Sadoughi Hospital is the biggest hospital in Yazd province and is the level 3 center in the referral system, regarding the abovementioned realities, the aim of this study is determining the level of preparedness of Yazd Shahid Sadoughi Hospital for confronting to emergencies and disasters after development of hospital disaster response plan.

Materials and methods

This cross-sectional, descriptive study has evaluated the vulnerability of the Shahid Sadoughi Hospital against the emergencies and disasters and also has recognized the hazards threatening the Yazd Shahid Sadoughi Hospital in 2016. The used tool was the Farsi Hospital Safety Index (FHSI) questionnaire in three scopes of functional, structural and non-structural terms to investigate the level of hospital preparedness. According to the documents and evidences, hazards identification of the province and Shahid Sadoughi Hospital was performed and the probability of occurrence of these hazards and the vulnerability of the Shahid Sadoughi Hospital against emergencies and disasters was investigated. Then, according to common events in the hospital, the "Action Plan" was prepared and finally, the "Disaster Plan" was designed. After that, using the Farsi Hospital Safety Index (FHSI) Questionnaire, which includes 61 items of functional safety, 71 items of non-structural safety, 13 items for structural safety (totaly 145 items), the level of preparation was determined.

Each questionnaire included the "Good", "medium", and "Low" items that were answered using the guide. The results were analyzed using Excel software.

This paper is based on the student dissertation of emergency medicine with the code of 1396:4576 .

Results

In this study, Shahid Sadoughi Hospital, as a affiliated hospital to Shahid Sadoughi University of Medical Sciences, Yazd, Iran was evaluated in terms of preparation against the disasters. After evaluating the Shahid Sadoughi Hospital against the unexpected events in 2014, by workgroup formation, the "Action Plan" and "Disaster Plan" were established for the hospital in three sections of structural, non-structural and performance safety.

This plan was established in the mentioned three scopes and for the following items: the tasks of firefighting team, dead body management, utilization of unused spaces in case of an emergency, disaster management in different treatment sections of the hospital in case of water disconnection, disaster management in the sections that all or some part of them gets fire, disaster management in different section of the hospital when the communication system is cut out, duties of the members in team, the patients admission process and unknown patients referral or reception from other hospitals inside or outside the geographical region, the food quota of the personnel in case of an emergency, the epidemiology care system of the hospital, protection of the patient's files, hospital services expansion process in case of an emergency, hospital evacuation process in case of a disaster,

duties of personnel and volunteers in case of a disaster, the process of communication with the system and people in case of an emergency, emergency section evacuation, in case of a disaster, elective procedures canceling in case of a disaster, hospital financial process plan, supply operative plan in case of a disaster, the hospital services expansion plan in case of a disaster, and emergency crisis chart.

The results of the study about the frequency of each of the natural disasters in the Yazd Shahid Sadoughi Hospital (in percent) showed that the technological and man-made disasters had the maximum frequency with 31% (Table 1).

Table 1. The frequency of different types of natural disasters in hospital

Disaster Type	frequency Percentage
Geological	7
Climate	16
Social Events	21
Biological	25
Technological and man-made	31
Total	100

The results of the study about the evaluation of Yazd Shahid Sadooghi Hospital against the crisis and the emergencies showed that non-structural elements safety level with a score of 53.33 had the maximum safety level in various elements of the hospital **(Table 2)**.

Table 2. The evaluation of the hospital against crisis and emergencies in three levels

Level	Score	Safety class
Performance safety level	56.39	6
Non-structural safety level	53.33	6
Structural safety level	73.33	8
Safety score (weighted)	63.94	7
Safety score (non-weighted)	56.41	6

The results of the study showed that according to the obtained safety scores, the safety level is classified in one of the below groups **(Figure 1)**:

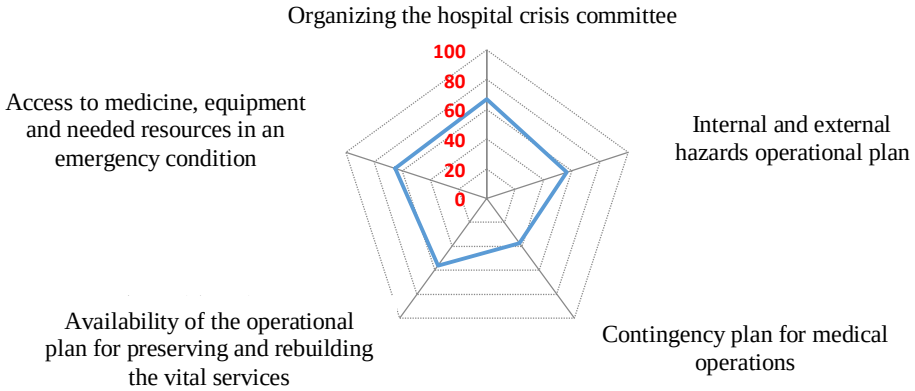

Figure 1. The evaluation of various performance safety in the hospital

The results of the study about the evaluation of the non-structural safety of the hospital versus the situation showed that the architecture elements scope had the maximum efficiency with the score of 100% compared to other non-structural elements of the hospital according to the location (Figure 2).

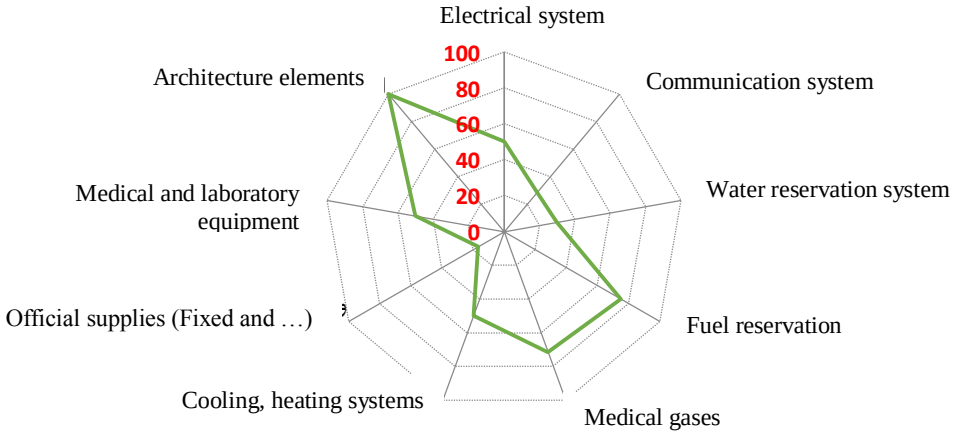

Figure 2. The evaluation of non-structural safety of the hospital versus the location

The results about the evaluation of the structural safety of the hospital showed that the structural system safety and the type of the material used in the building had the maximum efficiency with a score of 80% among the structural safety of the hospital (Figure 3).

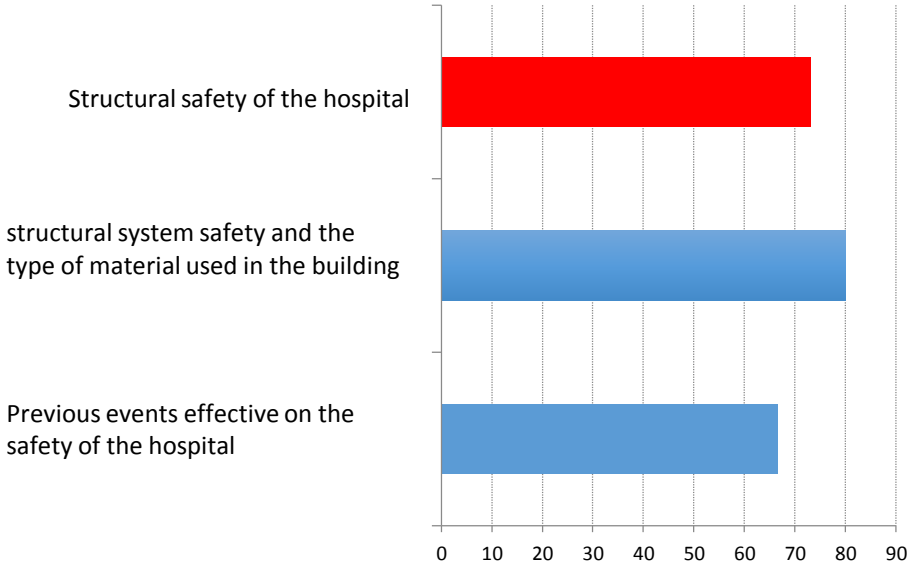

Figure 3. The evaluation of the structural safety of the hospital after the establishment of the plan

Discussion

In case of emergencies and disasters, health care centers are the first units that their optimized and on-time health services can have a vital and determinative role in decreasing death and saving the injured people (5).

There have been many studies about the readiness of hospitals against events and disasters. In most of these studies, the level of preparation of the hospitals was reported to be low. In a study performed in the Hospital of Iran University of Medical Sciences in 2007, the results showed that 9.5% of the hospitals had good preparation, 61.95 had medium preparation and 28.6% had low preparation (10). The results of this study were consistent with the results of Baradaran (11) in Iran and Clif (12) in America about the medium preparation of the hospitals against unexpected events. However, the results of a study performed in Urmia reported that the preparation of the hospitals against emergencies and disasters was low (13). These results were consistent with the results of Rahmanian et al. (14) the lack of preparation of the hospitals against the disasters is one of the several criteria that has direct effect on vulnerability of the country and the managers are aware of its importance and had requested for further research to solve this problem.

Therefore, according to this context and lack of readiness of the hospitals to confront disasters, the next studies seem essential to adopt a strategy to improve the amount of preparation of the hospitals against disasters (15).

The results of a study performed in Australia in 2003 showed that the functional planning of the emergency medicine in terms of holding the training courses and the organizational chart formation of the crisis management and formation of the communication of the emergency with other organizations still has some deficiencies and needs improvements (16). A study in USA in 2005 showed the necessity to establish a comprehensive training plan for the hospital personnel in confronting the crisis in hospitals (17). The results of a study performed in Taiwan in 2003 (18) and a study in Minnesota in USA in 2005 (19) also showed the necessity of the existence of a plan to confront the disasters. According to the imply of the studies on the necessity of the establishment of a plan to confront the events and disasters, many types of research have been performed on the necessity of planning the proper program against disasters. In a study that was performed by Khan et el, a national model of hospital incidents command system (HICS) was introduced as one of the proper models to establish comprehensive instruction to confront any kind of disaster (20). In a study performed by Khankeh et al, in 2011 the national protocol of the hospital preparation against the disatser was established (21). In a study performed in Urmia, the establishment of a comprehensive plan for confronting the emergencies and disaster was performed in terms of the assigning of members of disasters and emergencies committee in hospital and determining their job action sheet for responding to disasters (22). The results of our study showed that by establishing a plan to confront the disasters and the level of preparation of the Yazd Shahid Sadoughi Hospital showed that structural safety and functional safety have increased which these results were consistent with the results obtained from a study performed in the Shahid Ayatollah Ashrafi Esfahani Hospital in Isfahan (23).

Conclusion

According to the results of this research, it could be concluded that the amount of preparation of the Yazd Shahid Sadoughi Hospital is good in confronting the probable disasters and more efforts should be performed to improve it. On the other hand, it could be concluded that by long term planning its current deficiencies and future needs can be resolved.

It is suggested that training for confronting the crisis should be presented for the personnel of these centers and proper decisions to be made and become operational for notifying them and their participation. Some other researches should be performed in order to answer the remaining questions about this issue.

Acknowledgements

This study was a part of the MD. thesis in Shahid Sadoughi University of Medical Sciences,

Yazd, Iran. The title is "The Evaluation of the readiness upgrade of Yazd SHAHID SADOUGHI Hospital to deal with unexpected events after the establishment of a hospital crisis management plan" with the project No. 4576.

Funding source

This study is part of the MD. thesis. No financial support was received for this study.

Conflict of interest

The authors declare no conflict of interests regarding this study.

Authors' contribution

All authors contributed to this project and article equally. All authors read and approved the final version of the manuscript.

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