Determining Functional Preparedness of Selected Military Hospitals in Response to Disasters

Esmail Heidaranlu¹, Fatemeh Habibi¹, Ali Moradi¹, Leila Lotfian¹*

¹ Trauma Research Center, Nursing Faculty, Baqiyatallah University of Medical Sciences, Tehran, Iran

*Corresponding Author: Leila Lotfian, Trauma Research Center, Nursing Faculty, Baqiyatallah University of Medical Sciences, Tehran, Iran. Email: leila.lotfian@yahoo.com

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Abstract

Background: Iran is one of the most disaster-prone countries in the world. Hospital readiness is important for providing services to patients in times of crisis and can be considered an important indicator in crisis management.

Objectives: The present study was conducted to determine the functional preparedness of selected military hospitals in response to tragedy and disasters.

Methods: This cross-sectional-analytical study was conducted in two AJA-military hospitals in Tehran in 2020. A random sampling method was used to select hospitals. A checklist of functional preparedness of hospitals in response to disasters was used to collect data. Data were analyzed and coded with SPSS software.

Results: According to the results, the mean and standard deviation of the functional preparedness score for hospitals A and B were 86.17±4.24 and 81.76±10.52, respectively, and the total average score was 83.97±8.21, which indicated good conditions. The results of the independent t-test showed that there was no significant difference in the preparedness between the two studied hospitals (p=0.124). In hospital A, Recovery after Disaster, Increase capacity and Continuation of vital services and in hospital B, Support and Procurement Management, Continuation of vital services and Human resources areas had the lowest level of readiness.

Conclusion: According to the results, the studied hospitals were weak in functional preparedness, and hence should be repaired and improved in this field.

Keywords: Military, Hospitals, Disasters.

Introduction

Humans have been struggled with various harms and disasters since the creation now and they have incurred bodily and financial losses.¹ In terms of the emergence of an unforeseen event, Iran has been classified among the top ten countries around the world. Statistically, 31 natural disasters out of 40 natural registered disasters have happened in Iran and it is not unlikely to happen again.² Iran’s vulnerability to earthquakes is 1000 times more than America and 100 times more than Japan.³ It has been reported that 3.4 billion people around the world live in high risk area, 2.3 billion people are at risk of flooding and 328 million people live in the affected area by earthquake.⁴ Disasters occur suddenly and unexpectedly and can have serious and irreversible effects on the human health and healthcare system.⁵ More than 6% of disasters’ victims are assigned to Iran while only 1% of the world’s population lives in this country.⁶ Given the location of the land area of 11000 km² on the fault belts, high frequency of earthquake in more than 300 populous cities and inhabiting 77% of them on quake fault, 35 cities of Iran are affected by floods, typhoon and coastal waves.⁷⁻⁸ Hospitals, especially military hospitals, are one of the leading centers and institutions in times of disasters.⁹ In case of occurring incidence and disasters many victims and injuries are referred to the hospitals for receiving medical services. Therefore, hospitals are the first units offering instant services to victims and play a determinative role in decreasing the death rates.¹⁰ Due to the important role of these centers in the treatment of injuries during disasters, they need to be properly organized to be able to manage their performance in the event of disasters.¹¹ Principally, health care centers are an active part of disaster management and undetectable part of national health.¹² The most important concern regarding the health systems is the readiness of hospitals in crisis situations. Hospital readiness is a multi-interdisciplinary word that would be achieved through active partnership.¹³ In most hospitals, preparation for events and disasters is the highest priority, because they are faced with
the interference of responsibilities and incongruity in operations. Hospital preparedness includes providing standard practical responsibility and guidance for emergent activity in different sections of hospitals during a disaster that could affect the hospital’s staff, patients, visitors and society. According to the UN (Provide the complete name in the first use) office for disaster risk reduction, 1.2 billion people died out of 2.9 billion people affected by the disasters that happened from 2000 to 2012, which resulted in a financial burden of 1700 billion dollars. Thus, they need a structured program to confront such events. In developed countries, hospitals often should have a structured program for achieving preparedness and promoting their performance during disasters. One of the important points of disaster management is assessing a level of preparedness in hospitals before occurring disasters. The importance of disaster research is related to reducing and preventing the repetition of past mistakes that help grow and increase the ability to adequately respond to disasters. In this regard, evaluating the preparedness level of hospitals for disasters is important for determining and improving the hospital preparedness. This principle is doubly important in military hospitals, especially in Iran. Because military hospitals in Iran, as one of the most important health centers, have a special role in crises. On the other hand, evaluating the functional preparedness of the hospitals is closer to reality, and hence by improving this aspect of preparedness, more success can be achieved in disasters.

Objectives

Based on the evidence, determining the preparedness in the face of accidents and disasters, especially functional preparedness using national and local tools is one of the necessities. Since no study has been conducted on the evaluation of the preparedness of military hospitals in Tehran as the capital of Iran, this study aimed to determine the functional preparedness of selected military hospitals in response to incidents and disasters.

Materials and Methods

The cross-sectional-analytical study was conducted to determine the functional preparedness of two AJA-military hospitals in response to disasters in Tehran in 2020. A random sampling method was used to select the hospitals. For this purpose, the city of Tehran was divided into five regions: north, south, east, west and center. Then, two regions were randomly selected by lottery and again, one hospital was randomly selected from the AJA-military hospitals. In order to collect the data, a checklist of functional preparedness of hospitals in response to disasters with 262 items was used. This checklist as a national checklist has been approved by the Ministry of Health and Medical Education (MOHME) of Iran, and was first designed by Heidarnlu et al., (2015). This checklist consists of 250 questions in 17 aspects including 1- Command and Control (17 items), 2- Risk Assessment (9 items), 3- Rapid alert System (9 items), 4- Increase capacity (21 items), 5- Continuation of vital services (18 items), 6- Hospital Incident Command System (28 items), 7- Safety (14 items), 8- Security (12 items), 9- Communications (11 items), 10- Triage (10 items), 11- Hospital Evacuation Program (10 items), 12- Corpses and the dead (5 items), 13- Support and Procurement Management (36 items), 14- human resources (16 item), 15- Monitoring the hospital epidemiological care system (26 items), 16- Recovery after Disaster (12 items) and 17- Cultural considerations (8 items). Each item is scored zero (very poor), one (poor), two (average), three (good) and 4 (very good). The sum of the scores of the items in each aspect is the score of that aspect and the sum of the scores of the aspects is the total score of the functional preparedness, which is expressed as a percentage. The validity and reliability of the checklist were evaluated by Heidarnlu et al., (2015) in 30 hospitals. In the first part, the hybrid model concept analysis was used to explore the meaning of hospital functional preparedness and to generate the checklist items. In the second part, psychometric properties included face validity, content validity, construct validity, internal consistency and test-retest reliability. The face validity was approved by 15 experts in the field of health in accidents and disasters. The content validity index (S-CVI/Ave) was 0.87. The reliability was carried out by using Cronbach’s alpha for internal consistency (α= 0.978) and test-retest reliability was performed for stability with two-week interval (r= 0.875).

Data analysis

Data were collected from the two hospitals and entered into SPSS software (Version 19). Then the collected data were analyzed by descriptive (mean and standard deviation) and inferential statistics (Kolmogorov-Smirnov test and independent t-test).

Ethical Consideration
This study was approved by the ethic committee of the Baqiyatallah University of Medical Sciences (I. BMSU.REC.1398.327). Before conducting the research, all necessary coordination was conducted and the relevant license was obtained.

**Results**

According to the results, the mean and standard deviation of the functional preparedness score of hospital A was 86.17 ± 4.24 and in hospital B was 81.76 ± 10.52. The average total score was obtained to be 83.97 ± 8.21, which indicated good conditions. The results of independent t-test also showed that there was no significant difference between the preparedness of the two studied hospitals (p = 0.124). In hospital A, areas Recovery after Disaster, Increase capacity and Continuation of vital services and in hospital B, Support and Procurement Management, Continuation of vital services and Human resources areas had the lowest level of readiness (Table 1).

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Received aspect</th>
<th>Score from</th>
<th>Maximum score</th>
<th>Percentage preparedness of</th>
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<tr>
<td></td>
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<td>B Hospital</td>
<td>A Hospital</td>
<td>B Hospital</td>
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<td>33</td>
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<td>Risk assessment</td>
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<td>Rapid alert system</td>
<td>16</td>
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<td>Increase capacity</td>
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<td>Recovery after Disaster</td>
<td>34</td>
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<td>44</td>
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<tr>
<td>Cultural considerations</td>
<td>25</td>
<td>21</td>
<td>28</td>
<td>28</td>
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<tr>
<td>Total preparedness</td>
<td>independent t test</td>
<td>p = 0.124</td>
<td>t = 1.603</td>
<td>86.17</td>
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</table>

**Discussion**

In line with the purpose of the study, the results showed a suitable and high level of functional preparedness for the two AJA-military hospitals in response to disasters. In a research conducted by Mehri et al., on the investigation of hospital preparedness in Ardabil province against unexpected accidents, the results showed that the preparedness level of the hospitals was moderate. In a similar research conducted by Kazemzadeh et al., on the preparedness of hospital emergency departments for responding to disasters in Iran, it was found that the average level of preparedness of the hospital emergency departments in Iran to respond to disasters was from moderate to high. In another related research by Omidi et al., it was reported that the preparedness of hospitals affiliated to Jondishapur University was in moderate status and Imam Khomeini Hospital had the highest level of accident and disaster preparedness. Amiri et al., reported the moderate preparedness of the hospitals in the Northern provinces to deal with disasters. Moreover, Jafari et al., demonstrated that the amount of preparedness of the hospital was on the acceptable level. One of the main differences between the present study and the previous studies are attributed to the type of hospitals in terms of being military and civilian, and the research methodology. Also, the researchers have measured the functional readiness descriptively with specific tools. Also, no study has specifically examined the functional preparedness.
Another finding of the present study was the measurement of functional preparedness in various aspects, which among them, the Risk assessment and Rapid alert system had the highest score and their functional readiness was high. On the other hand, the aspects of Support and Procurement Management and Continuation of vital services had the lowest score and their functional preparedness was poor. In Dargahi et al., study on the functional preparedness and nonstructural safety of different health units, it was found that fire extinguishing section showed the highest readiness percentage of 68%. However, the risk reduction measures and health insurance coverage had the lowest percentage of readiness in responding to disasters, which were 3% and 0%, respectively.27 Ardalan et al., in a study on the estimation of hospitals safety in respond to disasters, reported that in recent years, the hospital safety has improved in the event of disasters in Iran, and more hospitals have joined the HSI program.28 Moreover, Marzaleh et al., by studying the emergency department preparedness of hospitals for radiation, nuclear accidents, and nuclear terrorism, introduced the financial issue as an important aspect of dealing with accidents.29 Bajow & Alkhalil by studying and evaluating the hospital’s preparedness in the face of disasters showed that disaster mitigation needs more actions, including risk assessment, structural and non-structural prevention, and preparedness for contingency planning, warning and evacuation.30

Conclusions

Given that in many assessments, there is a substantial difference between the hospital’s preparedness score and its real performance in the event of a disaster, it is necessary to measure and monitor the functional preparedness of hospitals, especially military hospitals. Achieving a good level of functional preparedness in military hospitals is a positive point, while required measures should be considered in hospitals with lower scores to improve their preparedness.

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Authors’ Contribution

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Conflict of Interests

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