



CODEN [USA]: IAJPB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.1143649>Available online at: <http://www.iajps.com>

Research Article

**ASSESSMENT OF THE PREPAREDNESS OF ALL AHWAZ  
MEDICAL CENTERS IN THE FACE OF THE CRISIS IN 2017****Farideh Pargar<sup>1\*</sup>, Khaled Biet saeed<sup>2</sup>, Ayat Alah ebadi<sup>3</sup>, Sedighe Ghobadian<sup>4</sup>,  
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**Abstract:**

*Accidents and disasters are sudden and sometimes catastrophic events that disrupt the pattern of life of people in society and, hospitals are among the first units that can play a vital role in saving the injured. In this study, the preparedness of all Ahwaz medical centers in dealing with the crisis in 2017 was investigated.*

***Materials and method:** This research is a descriptive study. The research tool is a Hospital Preparedness Assessment Questionnaire, which has 9 key components of command control, triage, human resource, communication, capacity building, support and logistics management, safety and security, continuity of critical services and post-disaster recovery. Score 1, score 2 and score 3 were respectively assigned to the under-review, in progress and completed activities.*

***Findings:** Command component has the highest average (88.9%). Thereafter, there were components of increasing capacity, safety and triage. The lowest level of preparedness, which itself has the most studied components, was related to human resource (44.4%), continuity of basic services (49.8%), and post disaster recovery (42.7%). The highest level of preparedness was in private hospitals.*

***Discussion and conclusion:** The preparedness level of 43.9% for the hospitals was evaluated at a good level. However, hospital managers should recognize the likely risks in their hospital or coverage area and, based on their geographical and indigenous conditions and hazards, they should be ready to deal with any crisis, while designing an accident prevention program.*

**Keywords:** preparedness, crisis, health centers

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*Please cite this article in press as Farideh Pargar et al., Assessment of the Preparedness of All Ahwaz Medical Centers In The Face Of the Crisis In 2017, Indo Am. J. P. Sci, 2018; 05(01).*

**INTRODUCTION:**

Accidents and disasters are a sudden and sometimes catastrophic event that disrupt the pattern of life of people in society and endangers human lives [1]. The statistics in 2013 show that there were 315 disasters worldwide which has killed more than 23000 people, while the continent of Asia has had the highest death toll than other continents [2].

Iran is ranked fourth in Asia in terms of outbreak of accidents and in the whole of the world is one of the ten most troubled countries in the world and in terms of vulnerability to disasters, is more vulnerable than the United States by 1000 times and Japan by 100 times [3]. The World Health Organization (WHO) (2003) has stated that, natural disasters result in many health hazards which is usually out of the power of the local system to respond to them [4]. Khuzestan province also has a specific vulnerability in Iran due to its natural conditions and characteristics. The location of this province in the Zagros sedimentary zone with two distinct geographically different desert and mountainous conditions in the south, west and north, and overheating, especially in summer (forest fires, electrical connections, etc.) has created special conditions in this province and has adverse effects on production, dispersion and persistence of dust in the province [5]. A number of provincial cities such as Ahwaz, Aghajari, Shushtar and Ramhormoz are located on earthquake faults [6]. On the other hand, the rare weather conditions in different regions of the province and the prevailing winds, as well as the recent droughts, have increased the exacerbation of dust phenomena with over-local origin [5].

The total of these factors has led the province to be confronted with different crises [6]. What is needed is that in the condition that, there is no time or opportunity to control and eliminate disasters, they have to take measures in the country to mitigate the negative effects and the resulting crisis [7]. Hospitals are among the first units in the event of incidents that, providing timely health care services can play a vital role in reducing mortality and survival of the injured [8]. The greatest need for medical care is in the first 24-48 hours after the disaster and requires extraordinary measures [9]. Therefore, hospital conditions must be rapidly changed and their facilities and reception capacity should be increased. Managers have to take basic managerial functions and increase their human and equipment and drug forces and have preparedness to respond to the crisis [10].

The study of the preparedness of hospitals showed that, despite the existing guidelines, their

preparedness is at a weak level, and confusion and lack of proper management are the most common problem in the event of a crisis [11, 12]. Jalali, in a 2012 study aimed at comparing disaster preparedness by measuring performance capacity between hospitals in Sweden and Iran showed that, the preparedness of hospitals in Iran is lower and everyone is at risk while the Swedish hospitals were at a good level. Hospitals in the Third World have more conflicts for preparedness and all hospitals need to be prepared for disasters [13]. The results of Khankeh *et al.* conducted to design health management model in the incidents, showed that hospitals are not prepared in the country [14]. In his study, Hosseini also estimated that 28.6% of their hospitals were at weak levels and 61.9% at moderate levels [15].

Adaptation to rapid changes should be based on predetermined schedules and in the form of periodic exercises to identify the negative consequences and achieve the highest efficiency [10], because the scene of the accident is not for test and error [8]. Therefore the College of Emergency Medical Specialists in 2003, issued a statement that all hospitals should have a place and process to provide medical care in the form of preparedness for unexpected accidents. Hospitals that regularly practice programs were less likely to suffer in the event of incidents [16].

The fact is that planning and inappropriate crisis management improves the scope of damages and increases the amount of damage [17]. In this regard, in recent years in the category of accreditation, the plans of the crisis management committees have earned significant points. This reflects a change in the positive attitude of policy-making authorities in the field of health to focus the authorities of universities and hospitals on the issue of health in crises. Therefore, in view of the special circumstances of Khuzestan province, researchers in this study examined the preparedness of all Ahwaz medical centers in dealing with the crisis in 2017.

**MATERIALS AND METHODS:**

This research is a descriptive study. The population of all hospitals affiliated to Ahwaz University of Medical Sciences includes social security, armed forces, private and charitable organizations. A total of 18 hospitals were selected with target-based method. Two hospitals were excluded from the study due to almost inactivity. Initially, a meeting was held in the governorate with the presence of the governor and the director general of the crisis and health experts. After obtaining a license from the governorate, the research deputy, and the heads of hospitals, they

completed their questionnaires. The questionnaires were completed by the commanders and the main members of the flowchart of the crisis and accreditation team of hospitals (10 from each hospital, total 180 subjects from the total hospitals).

The research tool is a WHO standard evaluation checklist for hospitals preparedness in disasters. This tool has been translated and validated by Karimian *et al.* (2013) at the Accidents and Disasters Health Research Center of University of Social Welfare and Rehabilitation Sciences [18]. The questionnaire contains 91 questions and 9 key components that consist of command control (6 questions), triage (9 questions), human resource (11 questions), communication (10 questions), capacity increase (13 questions), support and logistics management (8 questions), safety and security (15 questions), continuity of vital services (10 questions) and post-disaster recovery (9 questions). Each of the components has subsets. Each of the questionnaire's questions has three options of under-review, in progress and completed. Score 1, score 2 and score 3 were respectively assigned to the under-review, in progress and completed activities and from the total components, the score of each hospital's preparedness in dealing with crises was obtained. The score of 91-136 indicates a poor preparedness; 137-182 indicates moderate preparedness, 183-228 shows good preparedness, 229-273 represents very good

preparedness. The information was entered into SPSS version 22 and descriptive, Chi-square and regression tests were used to analyze the data.

### FINDINGS:

Table 1 show that the command component has the highest mean and represents the high level of hospital preparedness for the command, control and management of accidents and emergencies. Thereafter, they are increased capacity, safety and triage, respectively. The lowest level of preparedness, which itself has the most studied components, is related to human resource, continuity of basic services and post-disaster recovery which require special attention in the planning of managers and hospital directors and include important measures that operational plans have not been considered for them so far adequately by the crisis committees. The most frequent part of the in-progress activities are related to communications, human resources and the continuity of basic services which need to be monitored in subsequent evaluations and studies. The most frequency in the under-review measures is related to human resource, continuity of basic services and post-disaster recovery. All hospitals in the command component have had high preparedness and in the components of capacity increase, communication, and basic services, the hospitals had a similar level of preparedness.

**Table 1: Frequency distribution and percentage of hospital preparedness by component**

Categorization of variables	Variable	Frequency	Frequency Percentage	Component range
Under-review In progress Completed Total	command	5 15 160 180	2.8 8.3 88.9 100	6-18
Under-review In progress Completed Total	triage	3 69 108 180	7.1 38.3 60 100	9.27
Under-review In progress Completed Total	Human resource	30 70 80 180	16.7 38.9 44.4 100	11-33
Under-review In progress Completed Total	communication	4 76 100 180	1.7 42.3 56 100	10-30
Under-review In progress Completed Total	Capacity increase	8 51 121 180	4.4 28.3 67.2 100	13-39

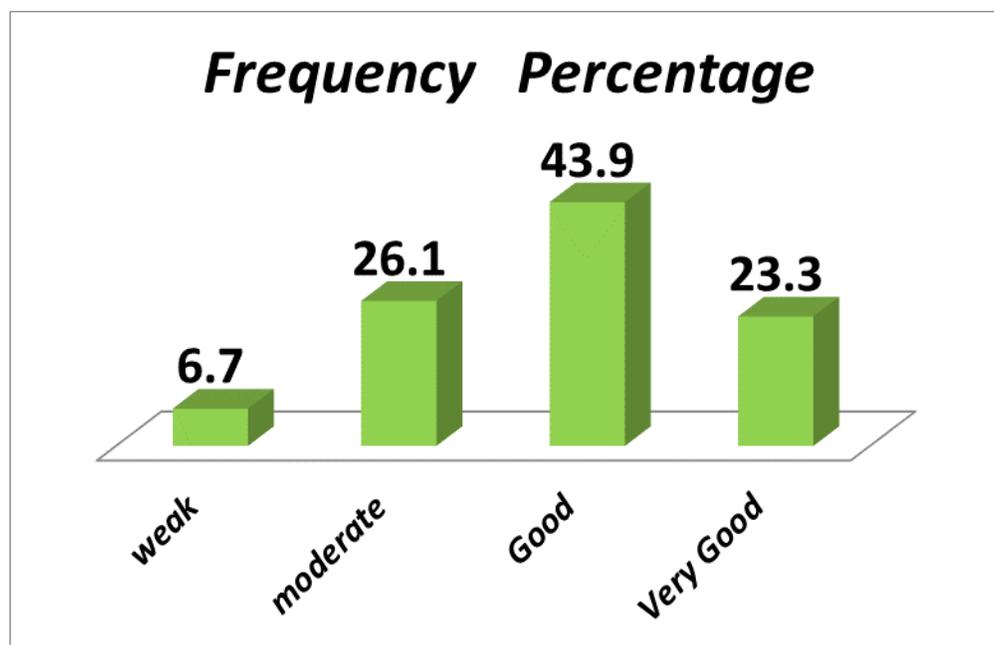
Under-review In progress Completed Total	Support and logistics management	17 59 104 180	9.4 32.8 57.8 100	8-24
Under-review In progress Completed Total	safety	17 53 110 180	9.4 29.4 61.1 100	15-45
Under-review In progress Completed Total	Continuity of vital services	28 65 87 180	15.3 35.8 49.8 100	10-30
Under-review In progress Completed Total	recovery	37 59 84 180	20.6 32.8 42.7 100	9-27

Table 2: shows the results of a regression analysis of hospital data suggesting which is most prepared in the field of command and related activities and hospitals' preparedness was poorly evaluated in the human resource component.

**Table 2: Investigation of the factors affecting the hospital's preparedness in crisis using the Odds Ratio obtained by regression method**

Model	Standard Error B		Beta	t	sig
Control Management	1.376	7.841	.061	.175	.029
Triage	1.115	.506	.181	2.204	.000
Human resource	1.806	.330	.127	5.467	.003
communications	.902	.296	.212	3.045	.000
capacity increase	1.269	.241	.233	5.275	.000
Logistics support management	2.086	.383	.205	5.450	.000
Safety	.959	.210	.107	4.558	.015
Continued critical services	.717	.292	.028	2.456	0.046
Post-disaster recovery	.204	.279	.061	.732	.029

Among the components, the greatest impact is caused by the increase in hospital capacity in the face of the crisis. The collected data were analyzed using Chi-square test and the hospital's level of preparedness was measured. Items have been listed in Figure 1. 43.9% of the hospitals were well-prepared.



**Fig. 1: Hospital preparedness in crisis**

#### DISCUSSION AND CONCLUSION:

43.9% of the hospitals were well-prepared.

The highest level of preparedness was in private hospitals. The results of this study are consistent with the results of the study of Hojjat (48.2%) and Siddiqi (42%) in Kashan hospitals and confirms the results of our study [19, 21], but it was not consistent with the results of Khanka [4] and Jalali [13]. In this study, the highest preparedness was in the field of command and most of its activities were in the category of completed items. If the accidents and disasters of any size and type often fail to be well managed, they result in multiple damage to health, inefficient management of resources, and high economic damage. In response to these dilemmas, the Incident Command System has been designed. This system is in fact a management system not an organizational chart. The incident command is the only place that is always active in any event [22]. In the study of the triage area, the preparedness of hospitals was assessed as good (60%). The results of this study were not consistent with the results of a scholarly study which assessed the preparedness level in the area of triage in one of Tehran's selected hospitals (41.7%) [23] but, they are consistent with the results of the Amerion's study (good level of 63%) and Sedighi (good level) [21, 24].

Experienced hospital managers in the imposed war, respiratory crisis, recent fires, clashes with the mobs, and so on are the reasons of good level of triage preparedness. On the other hand, the preparedness of this department is considered as one of the

quantitative and qualitative indicators of health care services and accreditation in hospitals. During the crisis, there should be no contradiction in the provision of services for public, private, military and civilian health centers.

In the assessment of the human resource component, the preparedness of hospitals is poor and 44.4%. Major problems were related to the lack of codification of job descriptions by the human resource manager, non-organization volunteer human resource insurance, and providing licensed human resource and shelter, water and supplies for staff family and family care (children, patients and family members with disabilities [25, 26]. In the study of Hojjat, the level of preparedness is poor (43.8%) [19], which is consistent with the findings of this study. Soleimani states that lack of resources, including human resource, in hospitals is quite evident [27]. Since, most of the hospital staff are women and have a motherly role in their lives and are responsible for taking care of their children and the sick and disabled members of the home, authorities should pay special attention to the requirements of the family of these employees, including men and women while designing operational plans.

Hospital preparedness component was evaluated in moderate level (56%). The result of this study are approximately the same with the results of the Daneshmandi's study (54.2%) and Hojjati *et al* (52.4%) and confirms the results of this study [19, 23]. In the Daneshmandi's study, the greatest

weakness was the lack of reliable communication substitutes such as satellite phones, mobiles, pager, walkie-talkie and Internet communications [28].

In times of crisis, the most important factor that ensures the success of operational plans is the proper communication, coordination and integration of all elements contributing to the fate of the crisis.

Today, using tools such as artificial intelligence, data mining, expert systems, etc., are able to classify and process large amounts of information while storing them and categorize and store all the signs, symptoms, features and consequences of a wide range of events and incidents in the form of comprehensive, accurate and dissociated reports and provide them in the shortest time remotely and closely to the managers [28]. The hospital commander should provide a list of organizations that monitor hazards such as meteorology, seismic, emergency, crescent, and police and ... and ensure that there is a proper connection directly or through the University's operating room [22].

One of the important factors in the hospital's effective response to events is the increasing capacity of health services in crisis situations. The absence of the program will change the acceptability of the injured, the conditions of service provision and the chaos and confusion among the different treatment groups in times of crisis [29, 30]. Hospital preparedness in this component and in the category of completed activities is 67.2% which is a sign of good preparedness for hospitals. The study found that hospitals need to be coordinated with other organs, such as mosques, schools and offices, in order to increase their capacity for physical, health and human resources, and for above cases there is a cases need a contingency plan to coordinate with institutions such as forensics, pathological labs and arthropods.

Another important factor in hospital response to disaster is support and logistics management. In this regard, the preparedness of hospitals is moderate (57.8%). In the study of Nasiripoor, the level of preparedness in this area was 74.6%, in the Amirion study it was 81.21% which did not conform to the results of our study [10, 24]. But in Husseini's study, this level of preparedness was 52.4%, which is consistent with the results of this study [23]. About 50% of the activities in this category were reported as completed and requires the completion of under-review and in-progress activities. The most important disadvantages in this section are to assess the quality of the items needed before buying and contracting with vendors to ensure the immediate delivery of equipment and other resources at a time of shortage.

Another area was safety and security where hospitals had a good level of preparedness (61.1%). These results are consistent with the results of Daneshmandi's study (64.7%), but they are not compatible with the study conducted by Maleki and Shojaei (47.6%) [31, 23]. This inconsistency can be due to the difference in spatial and temporal dimension of the study. The security of hospitals and their organization should include the security of the perimeter, transportation, and the arrival and departure of personnel, those who are volunteers and medical staff outside the organization. One of the most important weaknesses in this category was the lack of a region for the decontamination of radioactive, biological, chemical materials and their separation, and the management of hazardous substances and the prevention and control of infection. In recent years, good progress has been made in this regard with the establishment of the crisis committee.

Hospitals had the lowest level of preparedness for the continuity of vital services (49.8%) and post-accident recovery (42.7%). The results obtained in these two components were consistent with the study done by Bazgar in Bushehr hospitals [32]. The usual services of the hospital continue at the time of medical emergencies and incidents (emergency care, emergency surgery and maternal and child care). Most of the problems in this regard are the uncertainty about the possible mechanisms for collecting and disposing of hazardous hospital waste and ensuring that equipment such as ventilators and vital medicines are available to patients hospitalized at hospital discharge.

The implementation of post-disaster recovery programs should be done at the same time as initiating actions in the response phase. All damage should be evaluated and equipment, medications, water, oxygen, food and other supplies should be stored at normal levels. The most important shortcomings in this area are the identification of individuals to address the mental health needs of employees within 24 to 72 hours after the incident and counseling and support services for the families after the incident in order to help respond, recover and improve the performance. In most researches, two areas of continuity of vital service and post-disaster recovery have not been investigated. Therefore reference to them is not possible, but this study could be a reference for further studies.

#### CONCLUSION:

The preparedness level of 43.9% for the hospitals was evaluated at a good level. Average preparedness

of private hospitals is higher which can be due to resolved structural issues, independent sources of finance, taking prompt and immediate decisions due to differences in organizational chart, and even better implementation of accreditation scales. Compared to military hospitals, components can have the highest level of preparedness in the component of security and human resource due to having a human resources summoning plan in dealing with crises, conducting exercises and experienced military managers.

All hospitals, whether public, private, military or charitable, should be prepared to accept and increase capacity. Hospital managers should develop operational programs and conduct exercises, after assessing the potential risks in the hospital or the covered area, based on the hazards and conditions of the native and geographical location, using accreditation measures and views of health experts.

### ACKNOWLEDGMENTS

In the end, we thank and appreciate the governor and general manager of the province's crisis, the chairman and the deputies of the medical university, the heads of hospitals and colleagues who helped us in this way.

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