ORIGINAL ARTICLE

Investigation of the preparedness level of the hospitals against disasters in Bandar Abbas, Iran, in 2012

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Abstract

Objective: To determine the preparedness level of hospitals against natural disasters in Bandar Abbas, Iran.

Methods: The cross-sectional, descriptive study was conducted in all the 9 hospitals in Bandar Abbas, Iran, during 2012. The required data was collected using a standard checklist comprising 220 items in 10 areas. It was completed for each hospital using observations and interviews. SPSS 16.0 was used to analyse the data.

Results: The overall level of preparedness against disasters in Bandar Abbas hospitals was 38.6%. They were at a poor level in the areas of reception (31.4%), evacuation (28.1%), traffic (33.3%), security (34.6%), communication (30.6%), human resources (38.6%), and commanding and management (20.1%). Areas of emergency services (55.1%), training (53.5%), and logistics (53.5%) were moderate, while none of the areas could score enough to be in the good or very good category.

Conclusion: Preparedness was poor and hospital administrators should establish necessary technical and communication infrastructures through sufficient budgets to improve weak areas.

Keywords: Preparedness, Disaster, Hospital, Bandar Abbas. (JPMA 64: 506; 2014)

Introduction

Disasters have long been the cause of many problems throughout the world, including the loss of many lives, injuries, disabilities and huge financial losses.[1] Each year, 200 million people are involved in unexpected disasters and hundreds of them lose their lives. Due to such events, disaster-prone countries suffer from economic losses annually; on average, about 3% of their Gross Domestic Product (GDP).[2] Available data indicates an increase in the frequency of these disasters and their damage and losses. The occurrence of disasters in the world has been doubled and the number of people injured due to these disasters has been tripled over the last 30 years. Iran as a developing country is one of the regions that is most prone to unexpected disasters and is considered one of the 10 disaster-prone countries in the world where almost 90% of the population is at risk of natural disasters. According to the World Health Organisation (WHO), disasters create problems every time and every day, but, national and local authorities are not well motivated for planning to prevent their occurrence; most attention, funds and efforts merely get directed at rescuing the injured after the disasters as reactive and unstructured activities.[3-5]

Healthcare sector is a very important and vital sector because of the nature of its activities and its role in the treatment and rehabilitation of the injured. Thus, its facilities, particularly hospitals, should provide the required services without any interruption. This is possible only when the facilities achieve adequate preparedness before the disasters.[2] Hospital preparedness plans should be based on the identification of vulnerable areas in the organisation, and healthcare organisations' administrators should understand the possible risks and take actions in order to improve the standards for reducing the risks posed by unexpected disasters.[6] At the time of disasters, hospitals should have the ability to preserve their structures (physical structure, administrative structure, equipment, manpower, etc.) and processes to deliver optimal performance.[7] A WHO statement emphasizes that the reason for selecting the slogan of "Better health system responses to disasters" in 2009 was the excessive vulnerability of the hospitals and other community health facilities to disasters.[8] Occurrence of unexpected disasters can cause some problems in hospital settings, including personnel's and administrators' confusion, lack of emergency department (ED) capacity, inadequate medical equipment, disconnection from the internal wards and departments or systems outside the hospital, phone line disruption,

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delay in informing the relevant personnel and administrators, inefficient management system, and inappropriate accumulation of personnel, patients, and the public for rescuing the injured.[9] The preparedness of hospitals varies from country to country.[10] In different parts and cities around the world, large-scale damage and losses due to natural disasters have led to a lot of researches. A study in the United States showed that only 22 per cent of its hospitals had optimal preparedness against disasters.[11]

Conducting researches on the unexpected disasters is very important because their results will help to eliminate or reduce the probability of repeating the past mistakes and will increase the ability to respond to disasters.[12] Therefore, the current study was planned to determine the preparedness level of hospitals against disasters in Bandar Abbas, Iran.

Materials and Methods

The cross-sectional, descriptive study was conducted in Bandar Abbas, a southern province of Iran, during 2012. There were nine hospitals in Bandar Abbas — three public hospitals, two private hospitals , three military hospitals and one semi-pubic hospital — providing secondary and territry care. The required data was collected using a standard checklist whose reliability had been confirmed in literature[12] using Cohen's Kappa coefficient (κ=0.8). Its face and content validity were also approved using the experts' opinions. This checklist consisted of two sections. The first section contained general information about the hospitals and the second one included 220 'yes' or 'no' items in 10 areas of emergency services (30 items), reception (24 items), evacuation (30 items), traffic (15 items), communication (16 items), security (17 items), training (17 items), logistics (28 items), human resources (21 items), and commanding and management (22 items) whereby 1 referred to 'yes' and 0 to 'no'.

According to the hospital checklists and their scores, the preparedness of each hospital in all the areas was determined and categorised into very poor (0-20: no preparedness); poor (20-40: little preparedness); moderate (40-60: intermediate preparedness); good (60-80: appropriate preparedness); and very good (80-100: the best preparedness).[12] After obtaining permission from the relevant hospitals' administrators, the required data were gathered through completing the checklist for each hospital using observations and interviews with hospital administrators and experts. The data was analysed using SPSS 16.0. To maintain confidentiality of the collected data, the hospital names were not disclosed.

Results

All the nine studied hospitals in the study had received grade 1 in their last accreditation cycle except Hospital No. 5 which had grade 2 (Table-1).

Overall hospital preparedness against disasters was 38.6%. It was 'very poor' in 3 (33.3%) hospitals, 'poor' in 2 (22.2%) hospitals, 'moderate' in 2 (22.2%) hospitals, and 'good' or 'very good' only in 1 (11.1%) hospital

Table-1: Hospital characteristics.

Hospitals	Number of clinical units	Number of paraclinical units	Number of ambulances	Number of clinics	Capacity for hospital reception at the time of disasters	Accreditation grade
1	8	3	4	1	30	1
2	8	6	3	1	50	1
3	8	3	1	2	20	1
4	6	6	1	1	30	1
5	4	5	9	5	100	2
6	8	4	3	9	100	1
7	8	5	2	9	40	1
8	6	4	2	1	100	1
9	24	19	3	3	100	1

Table-2: The preparedness level of the hospitals.

Hospitals	Scores (% from total score:220)	Status
1	22 (10)	Very poor
2	40 (18.1)	Very poor
3	65 (29.5)	Poor
4	62 (28.1)	Poor
5	121 (55)	Moderate
6	135 (61.3)	Good
7	215 (97.7)	Very good
8	5 (2.7)	Very poor
9	103 (46.8)	Moderate
Score	85.3 (38.6)	Poor

Table-3: The percent of preparedness level of the hospitals.

Areas (%) Hospitals	Emergency services	Reception	Evacuation	Traffic	Communication	Safety	Training	Logistics	Human resources	Commanding and management
1	11(36.6%)	0(0.00%)	2(6.6%)	3(20.0%)	2(12.5%)	0(0.00%)	1(5.8%)	2(7.1%)	1(4.7%)	0(0.00%)
2	16(53.3%)	2(8.3%)	2(6.6%)	0(0.00%)	0(0.00%)	6(35.2%)	3(23.5%)	8(28.5%)	2(9.5%)	0(0.00%)
3	21(70.0%)	2(8.3%)	4(13.3%)	7(46.6%)	3(12.5%)	2(17.6%)	9(47.0%)	11(39.2%)	7(33.3%)	0(0.00%)
4	14(46.6%)	5(20.8%)	5(16.6%)	7(20.0%)	3(18.7%)	9(52.9%)	6(35.2%)	13(46.4%)	3(14.2%)	0(0.00%)
5	15(50.0%)	12(50.0%)	14(46.6%)	6(40.0%)	12(75.0%)	7(41.1%)	13(76.4%)	18(64.2%)	13(61.9%)	10(45.4%)
6	21(70.0%)	16(66.6%)	11(36.6%)	9(60.0%)	8(50.0%)	11(46.7%)	16(94.1%)	21(75.0%)	13(61.9%)	8(36.3%)
7	29(96.6%)	24(100)	27(90.0%)	15(100)	15(93.7%)	16(94.1%)	17(100)	28(100)	21(100%)	22(100)
8	3(10.0%)	0(0.00%)	2(6.6%)	0(0.00%)	0(0.00%)	0(0.00%)	0(0.00%)	17(60.7%)	(0.00%)	(0.00%)
9	19(63.3%)	7(29.1%)	9(30.0%)	2(13.0%)	3(18.7%)	1(5.8%)	17(100)	17(60.7%)	13(61.9%)	0(0.00%)
Score	(55.1%)	(31.4%)	(28.1%)	(33.3%)	(30.6%)	(34.6%)	(53.5%)	(53.5%)	(38.6%)	(20.1%)

(Table-2).

Moreover, the highest and lowest preparedness levels of the nine hospitals were related to the emergency services and commanding and management, respectively (Table-3).

Discussion

The study found Bandar Abbas Hospitals' preparedness against disasters to be poor. This was consistent with earlier studies.[13-17] However, in contrast to the current study, hospital preparedness was at a desirable level in some studies[6,18] and at a moderate level in some others.[1,11,20-22]

The level of emergency services was 48.2%, 77.6%, and 64.4% in three studies.[11,12,23] The results of the present study were confirmed only by one.[12] In terms of reception, some results were consistent with those of the current research.[11,12] The level of evacuation was shown as 39%, 33%, 48%, and 48.1% in certain studies.[11,12,23,24] The findings of the current study were in agreement with two studies.[12,24] The level of traffic was 48%, 48.8%, and 52.3% in three studies[11,12,23] and none of them confirmed our results. The level of Communication was poor in one study[6] which is consistent with the current study. However, this level was 52.3%, 54.2%, and 52.1% in other studies,[11,12,23] which are not consistent with the study's results. The level of Safety was 45%, 52.1%, and 53.6% in earlier studies[11,12,23] which again were not consistent with the results of the current study. Also, a study reported moderate level in terms of security.[24] The level of Training in some studies was 50% and 56%,[1,6] which confirms our results. However, in contrast to the present study, the level of this segment was 83% and 68% in other studies.[11,19] The level of Logistics was 61%, 63.7%, and 68% in various studies,[12,23,26] which was not in agreement with the results of the current study. Area of Human resources was also at a low level in one study.[6] On the other hand, its level was 61% and 71.1% in other studies,[1,23] which is not consistent with our results. Similar to this study, this area was at a low level in one study.[6] However, the level of this area was 80% and 67% in other studies.[11,23] Similar to our study, Commanding and management was at a low level in one study,[6] but the level of this area was 80% and 67% in other studies.[11,23]

Besides, disaster management in hospitals can be improved by using management systems, such as the Hospital Emergency Incident Command System (HEICE), appropriate organisation of human resources, accurate division of administrative tasks, and establishing the unity-of-command principle.[12]

The differences observed among the results of these studies regarding the level of hospital preparedness can be due to the difference in the methods of data collection (for example, using interviews, questionnaires and checklists, or observations), types of utilised checklists, study settings, time of data collection, and the expertise and training of data collectors.

It can be said that the hospitals with appropriate infrastructures located in large cities are more prepared compared to those with obsolete buildings in Bandar Abbas. To improve hospital preparedness in terms of security, the plans of security units should be developed and updated continuously. Organisational chart of this unit with job descriptions and responsibilities of the staff should be identified as well. In addition, the individuals authorised to enter certain places should be determined in advance.[9] Also, using Closed-Circuit Television (CCTV) cameras to increase the hospital security is common in many hospitals.[25]

In order to improve the organisational structure and to provide effective management of the entry and exit traffic system, the hospital heads should determine the job

descriptions of all the individuals involved in hospital traffic control and train them accordingly. Also, instructions on how to control the traffic and how to work with other individuals in and out of the hospital in order to control the traffic should be documented.[9]

Conclusion

Preparedness against disasters in Bandar Abbas hospitals was poor and most of the areas required improvement. For providing appropriate services in times of disasters, it is essential to supply emergency and medical equipment to hospitals and establish the necessary technical and communication infrastructures for which sufficient budgets should be allocated and spent. Also, using management system and protocols can promote a hospital's performance in disasters. Job-related training classes and safety courses are also suggested. Besides, qualitative studies need to be conducted to provide practical solutions, and interventional studies are required to determine the best interventions to increase hospital preparedness against disasters.

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