

Exploring Managers' Experiences of Hospital Disaster Preparedness: A Qualitative Study

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Abstract

Background: Preparedness is one of the important and effective pre-crisis management stages and involves all actions and programs that enable the organization to respond quickly and effectively in critical situations. To this end, this study aimed to explore the experiences of crisis managers and experts in hospital disaster preparedness.

Methods: This qualitative study was conducted using conventional content analysis in 2019. The research population included hospital managers and crisis specialists in Ardabil Province. The participants were 14 managers and crisis specialists who were selected using purposive sampling. The data were collected through semi-structured interviews and analyzed using Griesheim and Landman's qualitative content analysis approach.

Results: The analysis of the data revealed four main categories including management and planning, infrastructural development, human resources, and intersectoral coordination.

Conclusion: The findings of the present study highlighted the significance of preparedness for emergencies, management and planning, having codified instructions, and implementation and evaluation to increase the preparedness of hospitals to deal with emergencies.

Keywords: Emergencies, Disasters, Hospitals, Preparedness

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Introduction

Natural and man-made disasters directly affect human life and the environment and disrupt the economic and social functioning of the affected areas depending on their extensiveness. The severity of disasters in the world is increasing followed by many deaths, illnesses, and economic costs (1). Iran as a developing country with a special geographical position has always been affected by natural and unnatural disasters and is one of the countries with the highest disaster risk in the world (2). Ardabil province is no exception and has always been exposed to unexpected events such as floods, earthquakes, frost, etc. Following the zoning of earthquake risks in Iran, Ardabil Province is exposed to moderate to high earthquake risk, so that earthquakes have killed and injured a number of people several years ago (3).

Vahedparast et al reported that the studied hospitals

were not prepared for disasters (4). However, Amerion et al found that the rate of preparedness in confronting the crisis in three selected hospitals was 78% in terms of 11 indicators in question, indicating the optimality of the most hospital disaster preparedness indicators (5). Furthermore, Li et al showed the relative preparedness for public health emergencies of hospitals in some regions of China. However, the results indicated that China's hospital disaster preparedness programs were in the early stages of development (6).

The main focus in disaster management is on the health management of the affected community because disasters have a significant impact on the public health and welfare of the affected community. Thus, hospitals play an important role as the main and vital units of services delivery (7). Given the functions of hospitals as the first place for receiving disaster victims, their requirement for



continuing and even increasing their activities, and their commitment to engage in strong teamwork at the time of disasters, they need to have a disaster management plan (8-10).

Preparedness is one of the important and effective pre-crisis management stages and involves all programs that enable the organization to respond quickly and effectively in critical situations (11). A hospital disaster preparedness program, like all other programs, needs to examine the initial level of preparedness to identify the strengths and weaknesses of the system. Although numerous quantitative studies have been conducted in Iran, there are still many problems in times of crisis and disaster in hospitals.

Lack of hospital preparedness, lack of staff training, and lack of planning and organization for crisis control can cause irreparable damage to the health care system of the society. Thus, before a disaster happens, hospitals must be prepared to take effective actions at the time of disasters (12). Hospital disaster preparedness is very effective in the success and continuity of the functions of other social systems. Therefore, the importance of hospital disaster preparedness reveals the need for the design of an effective program to deal with unexpected events in hospitals (13). Moreover, despite various incidents and disasters in Iran and the possibility of their recurrence, previous studies have only adopted a descriptive approach to assessing the response situation. However, exploring the experiences of people directly involved in disasters can help in planning for coping with future disasters. To this end, adopting a qualitative approach, the present study aimed to explore hospital managers' and crisis specialists' experiences of hospital disaster preparedness.

Methods

The present qualitative study was conducted using a conventional content analysis approach in 2019. In conventional content analysis, categories are extracted directly from textual data. Thus, the hidden themes and patterns can be revealed from the content of the participants' data (14-16).

The research population included crisis managers and experts of public hospitals affiliated with Ardabil University of Medical Sciences. The participants were selected from managers and crisis specialists with the maximum diversion in terms of age, education, and occupation. The inclusion criteria were having at least 3 years of service records, having at least a bachelor's degree, participating in crisis management courses, and willingness to cooperate and participate in the study.

The data were collected through semi-structured interviews using open-ended questions. The interviews were conducted individually at the participants' workplace and the time appointed by them. The interviews started with an open-ended question: "Could

you please talk about your experience of preparing your hospital for disasters?". Furthermore, probing questions (Please explain more about this? Or What do you mean?) were asked to clarify the participants' statements and collect more detailed data. All interviews were recorded and then transcribed word by word immediately. The researcher listened to the interviews and reviewed the transcripts several times. The information obtained from each interview was used in the next interview. A total of 14 participants were interviewed and the data were saturated after conducting 12 interviews so that no new information or theme was discovered with additional interviews. Each interview lasted 40 to 60 minutes (50 minutes on average).

The collected data were analyzed using conventional content analysis according to the approach proposed by Graneheim and Landman (17). The steps taken under this approach included getting familiar with the data, generating the primary codes from the data, searching for the themes by reviewing the codes extracted from the previous steps, reviewing the themes and re-comparing them with the data to ensure their accuracy, defining and naming the themes, and preparing the final report. These steps were performed in the present study in the same order mentioned.

The criteria proposed by Lincoln et al including credibility, fittingness, dependability, and confirmability were used to ensure the accuracy and reliability of the data and findings (18,19). The credibility of the data was established through the researcher's long-term involvement with the research problem as was confirmed by the researcher's hospital management service records. To check the dependability of the data, the researcher met the participants several times before conducting the interviews to gain their trust and select a suitable space for the interview. The findings were also reviewed by participants. To do this, excerpts from the transcripts were returned to them to confirm the accuracy of the data. Furthermore, the findings were reviewed and confirmed by the members of the research team. Excerpts from the interview transcripts and related codes and emerging categories were also reviewed to check the accuracy of data analysis. The data collection and analysis were performed simultaneously to ensure the consistency of the data. In addition, to ensure the transferability of the findings, the data collection and analysis procedures were recorded and reported in detail to be used and assessed by others. Moreover, the findings were shared with several crisis managers and experts who did not participate in the study to confirm the fitness of the findings. The participants were selected with the maximum variation in terms of demographic characteristics to increase the transferability of the findings.

Before conducting the interviews, the objectives of the study and the interview techniques were explained

to the participants. Besides, they were ensured about the anonymity and confidentiality of the data. The participants were also told that they were free to leave the study at any stage they wished. Moreover, the interviews were recorded upon the participants' permission. The participants also expressed their satisfaction with the publication of the results of the study.

Results

Table 1 shows the participants' demographic characteristics.

A total of 620 primary codes were extracted from the data. The extracted codes were condensed into 12 subcategories and 4 main categories based on their similarities and differences. The main categories identified in this study were management and planning, infrastructural development, human resources, and intersectoral coordination detailed in Table 2.

A. Management and planning

Management and planning involve planning, organizing, leading, and controlling activities, before, during, and after disasters to reduce and recover the damage to the hospital.

Crisis action plan

Analysis of the participants' experiences showed that having a crisis action plan facilitates coping with crises. Taking preventing actions and holding a crisis management committee will be useful to increase the awareness of crisis management staff. One of the managers stated:

"We should have plans to manage and control the crisis and the dangers that threaten the hospital, identify the risk of the type of crisis and threat in the hospital, and discover ways to prevent crises and disasters before happening.

This helps hospital managers make effective planning in coordination with internal and external departments of the hospital and minimize the effects of the crisis with proper management" (Participant 13).

Training and practical maneuvers

Holding practical maneuvers is more effective in increasing the staff's readiness to deal with disasters than purely theoretical training. An analysis of the participants' experiences of disasters indicated that regular maneuvers for greater coordination as well as documentation and assessment of strengths and weaknesses of disaster management plans were useful. One of the crisis specialists stated:

"We have to improve the staff's knowledge and skills because human resources are in the crisis management frontline and thus we have to train people involved in this work, and this type of training will be more effective if it is held practically and in the form of maneuvers and if accompanied by the assessment of the strengths and weaknesses to address them in the next scenarios" (Participant 7).

Leadership

In any type of crisis and at any level, ensuring the effective use of resources and reducing problems in policymaking and operations is considered as an integrated and effective leadership system. The optimal performance of the leadership system is essential for the effective implementation of hospital disaster and emergency management plans. The participants stated that if the hospital management system has a plan to clearly formulate the duties of all crisis management staff and regularly monitor the performance of these duties in maneuvers and in real crises, it will increase the readiness of the members of the crisis team to deal with any disaster.

Table 1. The participants' demographic characteristics

Participant code	Gender	Marital status	Age	Education	Service records	Occupation
1	Male	Married	53	Ph.D.	25	Manager
2	Male	Married	55	Ph.D.	20	Manager
3	Female	Married	30	Bachelor's degree	10	Crisis specialist
4	Male	Married	50	Master's degree	23	Manager
5	Male	Married	38	Bachelor's degree	15	Crisis specialist
6	Male	Married	45	Bachelor's degree	18	Crisis specialist
7	Male	Married	36	Bachelor's degree	8	Crisis specialist
8	Male	Married	40	Bachelor's degree	16	Manager
9	Male	Married	44	Master's degree	13	Manager
10	Male	Married	43	Bachelor's degree	10	Manager
11	Female	Married	29	Bachelor's degree	3	Crisis specialist
12	Male	Married	27	Master's degree	7	Manager
13	Male	Married	35	Master's degree	14	Manager
14	Male	Married	34	Bachelor's degree	6	Crisis specialist

Table 2. The primary codes, subcategories, and main categories extracted in the study

Primary codes	Subcategories	Main categories
<ul style="list-style-type: none"> - Preventive actions - Having plans for all stages of the crisis - Holding regular crisis committees - Holding regular maneuvers for coordination - Documenting the executed scenarios - Assessing strengths and weaknesses - Developing job descriptions for all staff - Frequent visits by the commanding room - Planning for reducing stress in the staff - Planning for reducing stress in the staff's family members 	<ul style="list-style-type: none"> - Crisis action plan - Training and practical maneuvers - Leadership - Stress management 	Management and planning
<ul style="list-style-type: none"> - Developing, reforming, and standardizing hospital infrastructure - Monitoring hospital construction operations - Planning for substitute spaces - Preventing the conversion of the hospital into the cause of the crisis 	<ul style="list-style-type: none"> - Engineering supervision on hospital construction - Identifying factors leading to crisis in hospitals - Creating support spaces 	Infrastructural development
<ul style="list-style-type: none"> - Employing crisis specialists - Hiring skilled and trained staff - Recruiting human resources needed - Using public and voluntary workforce - Motivating the staff - Providing continuous practical training for the staff 	<ul style="list-style-type: none"> - Identifying competent individuals - Compensation for staff shortages - Manpower training 	Human resources
<ul style="list-style-type: none"> - Having memorandum of understanding with other organizations - Identifying partner and support organizations - Getting familiar with organizations engaging in the crisis 	<ul style="list-style-type: none"> - Intersectoral cooperation - Identifying duties and making coordination between partner organizations 	Intersectoral coordination

One of the managers stated:

“If the organization has a leadership system with well-defined responsibilities and job descriptions, it can reduce the consequences of disasters more effectively” (Participant 1).

Stress management

Stress refers to the tensions and pressures caused by the crisis. A low level of stress causes the person to become conscious, and if it is pathological, it will cause dysfunction. One of the participants stated:

“In times of crisis, we need to use the full capacity of our human resources, but in most cases, the staff are unable to cooperate because these people and their families themselves may undergo crisis. To manage human resources, we must also have a plan and protocol for their family members in times of crisis” (Participant 5).

B. Infrastructural development

Infrastructure means all hospital facilities, including buildings and equipment that are used to manage crises and emergencies.

Engineering supervision on hospital construction

Most of the participants stated that their hospitals do not have a suitable infrastructure to function as a hospital. Hospitals need supervision during the construction operations and foresight is needed in the planning stage. One of the participants stated:

“The infrastructure of the hospitals must be strong so that the hospital itself is not exposed to damage and crisis, and this requires full supervision from the beginning of its establishment, construction, and maintenance. The infrastructure and safety of the hospital itself are important. Since there is no suitable infrastructure, there

is no flexibility in terms of infrastructure and construction in the time of disasters” (Participant 9).

Identifying factors leading to crisis in hospitals

In times of crisis and disasters, most places are hit severely and hospitals are no exception. One of the hospital managers stated:

“Some functions of the hospital are deactivated in times of crisis. Based on the experience of these places and critical factors, we identified and planned so that the hospital functions would not be disrupted in times of crisis. For example, our electricity generator is in the basement. If it rains or floods, there will be no electricity in the hospital” (Participant 12).

Creating support spaces

The participants stated that due to the limited physical space, they needed a comprehensive program for admission and hospitalization of patients at the times the number of clients increases. To this end, some hospital officials identified alternative locations and spaces around their hospital and even had a memorandum of understanding. One of the participants stated:

“Our hospital is old and there is limited physical space. We signed a memorandum of understanding with the school next to the hospital so that we can use the physical space of the school in times of crisis when the number of visits increases” (Participant 2).

C. Human resources

Human resources as the most valuable and important asset of any organization include people who must be actively present in the hospital in times of crisis.

Identifying competent individuals

Identifying competent, specialized, and trained people and using these people in the crisis management chart can strengthen the hospital crisis management system and make management easier in the event of an emergency. Accordingly, one of the participants stated:

“Based on my experience, trained and skilled people are helpful in the crisis and help us manage a large percentage of crisis casualties. The use of professional and skilled staff for hospital crisis management makes other employees obedient and more active” (Participant 4).

Compensation for staff shortages

Hospitals normally have a shortage of workforce, and this shortage is more severe in times of crisis. Therefore, workforce management has been considered as an important element in dealing with and reducing damages due to the crisis, and the use of volunteer staff and the recruitment of new employees were considered useful for this purpose. One of the participants stated:

“Currently, we are facing a 50% shortage of manpower. If unexpected events such as earthquakes, floods, etc. occur, which usually takes 20% of the manpower, the hospital will face an extreme shortage of manpower. Thus, we have a list of domestic and foreign volunteers who will be called up if needed” (Participant 10).

Manpower training

Manpower training, if continuous as well as practical and operational, is far more useful in increasing the readiness of hospitals to deal with the crisis than purely theoretical training. Furthermore, some managers emphasized motivating staff to participate and work in training workshops. One of the participants stated:

“We need to train manpower in a practical way, not with theories and checklists and indoor training courses. With this type of training, we cannot respond to disasters and crises. In fact, we first need well-trained and skilled staff. Second, the existing infrastructure must be developed, and finally, we must have special practices for the crisis, and at least 3-4 annual practical training workshops” (Participant 11).

D. Intersectoral coordination

It refers to the well-known relationship between different parts of the hospital and other organizations involved in the crisis. In times of crisis, they cooperate to achieve good results.

Intersectoral cooperation

In a crisis, everything changes, and most organizations take action to provide relief, so identifying partner organizations and in some cases having pre-crisis cooperation and support agreements are very useful in disaster management and control. One of the managers stated:

“Using collective wisdom and coordination with the crisis management center of the province, planning and interacting with all hospitals, and launching mass messaging to call the organizations involved in the crisis in the province to increase the capacity to deal with the crisis can be helpful” (Participant 8).

Identifying duties and making coordination between partner organizations

Lack of clarity of duties of various organizations that are actively involved in crises, as well as unfamiliarity with their duties and those of other organizations, cause interference in work and as a result, lack of coordination in relief operations. One of the crisis specialists stated:

“The lack of coordination among the members of the crisis management team, as well as with other organizations that help each other at the time of disasters and unfamiliarity with and overlap in tasks lead to inconsistencies in helping victims. Our experience in maneuvers shows if we act in unison, we will have a faster speed of action in providing relief” (Participant 3).

Discussion

This study explored crisis managers' and experts' experiences of hospital disaster preparedness. Four main categories were identified as the most important factors in increasing hospital disaster preparedness. In most studies conducted in Iran, hospital disaster preparedness has been reported as weak to moderate. For example, Parsaei et al reported that most hospitals in Mazandaran province were not adequately prepared to cope with disasters and highlighted the need for improving hospital preparedness in all its dimensions to effectively cope with disasters and emergencies (20). Previous studies have shown that the readiness of state hospitals in Ilam province, Kermanshah hospitals, and Yazd teaching hospitals was at an average level in coping with different dimensions of disasters (21-23). Moreover, some studies pointed to factors such as the absence of effective crisis control and management models, inadequate coordination and cooperation in times of crisis, inadequate hospital readiness, poor planning, and lack of resources as barriers to patient care in times of crisis. They have also shown that establishing a registration and follow-up system, regular implementation of disaster management courses, and effective use of resources are some strategies to increase hospital disaster preparedness (24,25).

The present study showed that effective management and planning is one of the most important factors for improving hospital disaster preparedness. Ghafari et al and Rahmanian et al found the lack of a formulated and structured model, poor awareness, lack of up-to-date planning and organization, lack of familiarity of personnel with their job description and importance of the issue, lack of a crisis management team or committee,

lack of training and maneuvers in this field, and not involving members in designing preparedness models as obstacles to hospital disaster preparedness. Furthermore, they suggested holding training maneuvers at all levels and in cooperation with other organizations, motivating personnel, defining the crisis chart, considering mental health, and also avoiding the dismissal of previous officials as some strategies to enhance hospital disaster preparedness (26, 27). Since the data in the present study were collected by surveying the experiences of managers involved in management affairs, especially hospital crises managers, who were well aware of the importance of planning for crisis management, it can be argued that having effective planning, especially crises action plans, and continuous evaluation after holding training courses in maneuvers and scenarios designed for this purpose can improve the readiness of hospitals to cope with disasters and emergencies.

The second theme identified in this study was the development of hospital infrastructure. Accordingly, similar studies have mentioned old buildings not constructed in compliance with technical hospital standards and the lack of sufficient and advanced equipment as obstacles to hospital disaster readiness. Besides, the safety of the hospital in terms of buildings constructed in compliance with engineering principles, adequate equipment, having a support system, and creating enough space for performing some tasks required for crisis management are some ways to increase hospital disaster preparedness (26,28). Hospitals need to be designed, constructed, used, and maintained in line with international standards. Moreover, there should be some strict rules and regulations for monitoring crisis management at all stages. Lack of defined management and strategies for hospital design, construction, and maintenance are the main cause of hospital worn-out structures at present. Therefore, in addition to the fact that the hospital space should be suitable for clients and medical staff, solutions should also be developed to increase the reception capacity, physical space, equipment, and manpower in times of crisis. To achieve these goals, in addition to adequate supervision during the construction of hospitals, hospital managers must develop effective plans to increase the capacity of their hospitals in times of crisis.

The results of the present study highlighted human resources as the third major issue in hospital disaster preparedness. A survey of the participants' experiences showed that the presence of crisis specialists who have received the necessary training is effective and useful in disaster management and in practice, is of great help in dealing with crises. Besides, the shortage of manpower, which is a very important issue in the crisis, can be compensated by planning to use volunteer staff and can greatly contribute to controlling the crisis. In line with

these findings, Vahedparast et al and Hojat et al reported that the hospital disaster preparedness was average in terms of human resources (4, 29). Manpower is one of the most important components of any organization and is also a constant concern of hospital officials, especially hospital managers. Any disaster, both natural and man-made, can affect hospital staff. Hospital disaster staff are affected by disasters, both as health service providers and as recipients of services. Thus, it is important to increase the readiness of hospitals to cope with the crisis faced by hospital staff. Paying special attention to increasing and improving the readiness of hospital staff can be useful in achieving good outcomes in times of crisis. In line with the observations made in the present study, Ghafari et al and Keshvari et al highlighted the need to hold theoretical and practical crisis management training courses periodically and regularly for hospital managers and staff (26,30).

The last theme identified in the present study was intersectoral coordination. Other studies have indicated that the absence of a detailed plan by the provincial crisis management centers for integrated actions and the lack of coordination between hospitals and other centers are the main obstacles to hospitals' preparedness for disasters. Besides, developing detailed plans, communicating them to all centers, concluding contracts and memorandums of understanding with other centers, and designing a codified and structured program of disaster preparedness in cooperation with the crisis management centers are some as solutions to remove obstacles and improve hospital disaster preparedness (26). One of the requirements of crisis management, especially in hospitals, is intersectoral coordination. Disasters cause conflicts in different communities and centers. If there is no coordination between internal and external units in emergencies and disasters, the problems and complexity of the crisis will multiply. Furthermore, the damages caused by disasters will be great and irreparable due to mismanagement. Therefore, improving coordination between hospital units by creating a comprehensive and complete plan of actions that different units are required to implement and observe will increase the readiness of hospitals and prevent damage caused by the absence of coordination.

It should be noted that the subjective nature of data collection and the possibility that the participants refused to state certain facts due to their current responsibility may limit the generalizability of the findings of the present study. However, it was tried to select the participants from people with deeper and more valid experiences to make the results largely applicable in similar situations. Moreover, the participants' workload could partly affect the possibility of conducting accurate interviews with them. Therefore, similar research can be conducted on a larger scale and with other individuals and managers involved in crises and disasters.

Moreover, following the results of the present study, it

can be suggested that using experienced, specialized, and trained staff for crisis management, holding practical courses for all hospital staff, having a plan to use volunteer staff in times of crisis (preparing a list of volunteers before crisis, having a plan to increase attendance motivation, etc.), forming a planning team in hospitals, preparing and distributing educational booklets and pamphlets suitable for all individuals and groups involved in crisis management to increase coordination, motivating staff for further preparation, creating public spirit, supporting staff families, overseeing the construction of hospitals according to standards, concluding memorandums of understanding with other organizations, and familiarity with the job descriptions of all organizations and departments involved in crisis management can play a very important role in improving hospital disaster preparedness.

Conclusion

Given the functions of hospitals as the first place for receiving disaster victims, their requirement for continuing and even increasing their activities, and their commitment to engage in strong teamwork at the time of disasters, they need to have a disaster management plan. Thus, effective planning, developing disaster management guidelines, and their continuous implementation and assessment are essential for improving hospital disaster preparedness.

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Conflict of Interest

The authors declared no conflict of interest.

Ethical Issues

The present study was approved by Ardebil University of Medical Sciences with the code of ethics IR.ARUMS.REC.1395.130.

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