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Original Article

Public Health Section

Challenges for Hospital Resilience in Emergencies and Disasters: A Qualitative Study in Iran

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ABSTRACT

Introduction: Since hospitals provide crucial lifesaving services in societies, hospital resiliency plays an essential role in minimising the impact of disasters on the community. A resilient hospital should be able to resist, absorb, respond to, and recover from the impacts of disasters as well as continues its normal operation.

Aim: This study aims to explore the main challenges for providing a resilient hospital in emergencies and disasters in context of Iran.

Materials and Methods: This was a qualitative content analysis study. Interviews are in-depth and semi-structured. Each interview begins with open questions and questions become progressively narrowed based on the participants' responses. Six themes were initially formed based on analysing the primary codes. Themes were also composed of 21 categories and 20 sub-categories. Interviews were conducted with 18 experts {9 hospital managers and 3 doctors (Ph.D.) in emergency and disasters, 3 supervisors and 3 matrons} and analysed using qualitative inductive content analysis approach. Finally, an expert panel was conducted by a team of experts including 10 people {3 hospital managers and 2 doctors (Ph.D.) in emergency and disasters, and 5 supervisors}.

Results: The main concepts which have been explored in the study include; lack of preparedness, continuity of essential service, non-coherent function, emotional response, developing functionality and non-resilient confrontation. Each concept includes several main categories, and main categories are also divided into several subcategories based on their field and according to their significant characteristics.

Conclusion: Exploring the challenges which a hospital faces in emergencies and disasters that affect the normal operation of the hospital helps the disaster managers to improve their plans to handle the disaster situations. Findings show that the challenges of all phases of disaster management (such as prevention, preparedness, response, and recovery) must be considered by the disaster managers together. Since disaster situation is very stressful for both injured peoples and disaster management team, therefore, it is recommended that the psychological challenges of a resilient hospital after a disaster occurs are clarified.

Keywords: Capacity building, Emotional response, Hospital management, Preparedness, Recovery

INTRODUCTION

A disaster is a serious disruption, occurring over a relatively short time, of the functioning of a community or a society involving widespread human, material, economic or environmental loss and impacts [1]. By analysing the information about the impact of disasters occurred across continents for more than two recent decades, it can be seen that the number of disasters and their impacts are meaningfully increasing. Studies by Centre for research on the epidemiology of disasters (CRED) have indicated that for two last decades, 6,873 natural disasters have occurred globally. These disasters have caused 1.35 million deaths in this time period and 68,000 annually on average. Also, it has affected 218 million people per year [2]. Looking at the distribution of disaster occurrences across continents in the last decade provided by CRED, it can be seen that Asia is most frequently affected (46.7%), followed by the Americas (24.3%), Africa (16.9%), Europe (8.2%), and Oceania (3.8%) [3]. However, the share of Asia is, in 2016, exceeding its 2006-2015 annual average (41.3%), while the share of Europe in the distribution is lesser than its annual average (13.1%). In Iran, as one the most disaster prone countries in Asia, studies show that (31.7%) of the total area of this country is highly risk regions for natural disasters, where about (70.0%) of the population of this country are living. In Iran, flood and earthquake are two most frequent catastrophic natural disasters that result in a huge number of injured and victims. Due to this, based on a world-wide ranking, Iran is ranked in the 3rd place in terms of disaster occurrence rate, and in the 10th place in terms of injuries and deaths [3,4].

Due to increasing frequency and impact of different natural and, man-made disasters, such as earthquake, pandemics, terrorism, etc., in recent decades, disaster resiliency has received a lot of attention by the researchers in field of public health.

Disaster resiliency is generally defined as the capability of the individual, organisation or community to resist, respond to, and recover from the impact of disasters. A disaster resilient hospital should be able to continue its normal operation (i.e., health care services) during disasters, even if the hospital itself is directly affected by the disaster [5,6]. In a disaster, the community is messed up, and individuals might be severely injured and might need healthcare and many other services that must be provided very soon. In case of any disaster, before any government machinery and support or outside help, it is the community which has to respond immediately. That is, the community plays the role of first responder. Therefore, it is critical that there is adequate awareness and preparedness at the community level, especially in vulnerable areas. Emergency medical system (EMS) as a part of the community is responsible to provide urgent medical response, and pre-hospital health services.

Since the hospitals are the heavens where injured and affected individuals refer to receive healthcare services, food, water, shelter, psychosocial assistance, and even information about future threatening dangers related to the incident [7], or about their missing family members, therefore, hospitals must be very safe and disaster tolerant in such a way that they can continue their normal operations as much as possible. That is, hospital must be prepared to confront with disaster, resolve it, and recover from it.

Paradoxically, such an essential part of the community, where its operability (i.e., continuing the normal operation) during disasters extends beyond the necessity to sustain uninterrupted medical

services, is considerably even more vulnerable than others in disasters, mainly due to its complex combinations of utilities [6,8].

Though many kinds of natural and man-made disasters such as earthquake, flood, drought, and climate change threaten the life of many people all around the world every year, very few studies have been conducted on hospital resiliency in emergencies and disasters (no study has been conducted to explore and categorise the challenges of hospital resilience in context of Iran) [8-11], however, considerable studies have been done in the area of hospital preparedness [12-17], hospital safety [18,19], and surge capacity [20,21].

Community resiliency in disaster has been widely studied [22-31] by researchers in the last decade, however, hospitals as the most important part of the community that significantly reduce the impact of disaster on the community by providing healthcare services has received poor attention. To fill the gap, this study aims to explore challenges for hospital resilience in disasters in context of Iran. After finding the challenges, disaster management team would be able to design a comprehensive and applicable hospital disaster plan with which the hospital would be able to continue its normal operation when a disaster occurs.

MATERIALS AND METHODS

The type of this study is content analysis-based qualitative approach. Qualitative content analysis approach is a suitable method when new areas are to be investigated in an exploratory manner, or if it has been decided to explore a known area from a fresh perspective. This study was mainly conducted in critical and large hospitals of Tehran and Arak (in Iran), where, after a disaster, a huge number of injured refer to. This study (interview part) was conducted in 11 months during May 10, 2017 to April 10, 2018. In this study, the researchers aimed to explore the challenges for hospital resilience in emergencies and disaster in context of Iran.

Study Participants

This qualitative approach collects the required data directly from 18 participants (i.e., total sample size) who are 9 hospital managers and 3 doctors (Ph.D.) in the field of medical emergency and disaster, 3 supervisors, and 3 matrons mainly having 10 years of experience in the field of hospital disaster management at least. Furthermore, an expert panel was conducted by a team of experts including 10 people {3 hospital managers and 2 doctors (Ph.D.) in emergency and disasters, and 5 supervisors} to evaluate the obtained results. All selected participants have experienced several disaster situations. Each participant signed informed consent or gave a verbal consent to participate in the study. As shown in [Table/Fig-1], total number of participants in interviews and expert panel was 28 as mentioned above.

Number of participants (n)	Position of participants	Gender (%)	Mean professional experience (year)
n=17	12 Hospital managers and 5 doctors (Ph.D.) in emergency and disasters	Male (100%)	12±3
n=8	8 Supervisors	Male (87.5%), Female (12.5%)	15±4
n=3	3 Matrons	Male (100%)	16±5

[Table/Fig-1]: Participants characteristics (Position, Gender, and Professional experience) in interviews and expert panel.

Type of interviews was in-depth and semi-structured beginning with open questions, gradually continuing to more detailed ones. All interviews were oral. In order to obtain the best results, a purposeful sampling technique with maximum diversity was used to select the expert participants and continued until data was saturated. Data saturation means that no more useful information was provided by new participants (i.e., no new code is developed or no existing code is extended).

Six more interviews were also conducted with 2 nurses, 2 physicians, and 2 technicians who work in the hospitals. They also provided useful information about the hospital situation when a disaster occurs. However, though they have experienced disaster situation, due to the lack of a disaster management insight, they only describe the hospital situation rather than analysing the difficulties, and proposing practical solutions. Therefore, the information collected from these participants were not included in this study. [Table/Fig-1] shows the characteristics of participants as their position, gender, and professional experience.

Data Collection Method

In-depth and semi-structured interview has been used to explore the experiences of study participants. This kind of study begins with open questions, gradually continuing to more detailed ones [32,33]. The interviews begin with broad questions about solutions to avoid a hospital disaster, difficulties with managing hospital, and operation of the hospital after disaster such as “How is the function of your hospitals after a disaster?” or “Have you ever experienced a disaster that disrupts normal operation of your hospital? Please explain.” or “In your experience, what are the reasons for the abnormal operation of the hospital in disasters?” or “What should be done to avoid a disaster in hospital?” After each question, based on the answers provided by the participants, some more detailed (narrowed) questions are also posed.

All interviews were recorded and the required field notes were also taken when an interview is conducted. Field notes were used to analyse and interpret the responses of participants. Time of each interview was normally between 40 to 60 minutes and the time of interview was set based on the agreement between researcher and participant. All interviews were held in the office of the participants.

Data Analysis Method

The collected data was analysed based on the principles of qualitative content analysis method recommended by Granehem UH et al., [34]. This method is composed of four stages:

- Selection of a unit of analysis;
- Detection of the meaning units and referring to a phrase or a keyword;
- Condensation of the meaning unit (i.e., shortening the extracted units with preservation of the core);
- Abstraction (i.e., descriptions and interpretations on a higher logical level and creation of categories.

Based on the above mentioned four-steps data analysis method, extracted codes were compared and pruned based on differences and similarities and afterwards sorted by categories and sub-categories. The meaning units of data were extracted based on differences and similarities in properties and dimensions. Similar codes were classified in the categories with a higher abstract label. Categories are discussed within the research team and appropriate themes are extracted. Codes and categories are the product of the inductive process and abstractly ordered, considering properties were developed [35,36]. To verify the obtained results, an expert panel was conducted by a team of 10 experts. The experiences and viewpoints of the experts were gathered and after the final analysis they were reflected to the final results that are reported in this study.

Data Integrity

In this study, for research rigor, multiple strategies were used. Furthermore, triangulation of participants helps us to take into account different point of views when analysing the data. Maximum diversity of sampling (of participants) also confirms the credibility of the data. The extracted codes and categories are rechecked and discussed by the researcher team and content expert to generate the final codes. To confirm the validity of data, member check, peer check, and expert check are performed. Peer check is done by two

other researchers who were Ph.D. students concurrently working on the qualitative study projects. Findings of this study were also strictly reviewed by the research team as an expert check.

Ethical Considerations

For ethical consideration, each participant signed informed consent or gave a verbal consent to participating in the study. Informed consent was obtained through explaining the aim and process of the study orally and in writing. Participants had the right to withdraw at each stage of the research. The study was approved by the University of Social Welfare and Rehabilitation (USWR) Research Committee and Ethics Committee in Iran (IR.USWR.REC.1395.150). Information was confidential and participants' identities were made anonymous for use in this paper.

RESULTS

As shown in [Table/Fig-2], after a qualitative analysis of the data gathered to explore the challenges for hospital resilience during disasters in context of Iran, six main concepts were extracted that are as follows:

Main problem	Theme (Main concept)	Category	Subcategory
Challenges of hospital resilience	Lack of preparedness	Traditional function	Different viewpoints
			Lack of collaborative approach
			Inadequate knowledge
			Out of date technology
		Defection of programs and processes	Variety of assessment programs
			Requirement to plan's revision and modification
			Disorganised resources
	Non-coherent function	Inefficient response	Inefficient Organisation
			Inter-organisation coordination obstacles
			Deficient management
		Information mismanagement	Inefficient procedure of information exchange
			Weak information analysis
			Imperfect communication management
		Incomplete resource provision	Challenges in resource allocation
			Challenges in resource provision
	Continuity of essential services	Designing local and state plans	
		Requirement analysis and modification response process	Identifying critical elements
			Physical surge capacity
			Developing equipment and Infrastructures
		Expediting service provision	Increasing capabilities
			Reinforcement of Internal coordination
		Hospital surveillance system	
	Emotional response	Overestimating in disaster level	
		Emotional reaction	
		Administration by higher level managers	
	Developing functionality	Reinforcement of on-demand plans	
		Designing efficient plans	
		Prioritising emergencies in plans	
	Non-resilient confrontation	Unrealistic assessment	
		Power orientation	
		Performance reduction	
		Structural damage of hospital	
		Delay in recovery	
		Distrust to hospital	

[Table/Fig-2]: Main problem, extracted themes, categories, and subcategories.

Lack of Preparedness

After a disaster (e.g., earthquake or flood) occurs, routines of all parts of the society are disturbed. Therefore, preparedness to confrontation with this situation, conservation of the system function and returning to the primary situation is of great importance. As mentioned earlier, having a comprehensive plan to manage the difficulties caused by disaster is of great importance. To design a complete plan, the ideas of professional experts in different levels of the health care system are required. Different viewpoint of managers and experts about the disaster and the approaches to tolerate this situation is one of the main problems for getting prepared before disaster. [Table/Fig-3] shows the codes from which categories and subcategories of theme "lack of preparedness" were extracted.

Main concept (Theme)	Category	Subcategory	Code
Lack of preparedness	Traditional function	Different viewpoints	Unbelief to plan modification
			Rigid structures
			No collaboration in planning
		Lack of collaborative approach	Low individual skills
			Weak team working
			Duplication
			Inefficient cooperation of different units
		Inadequate knowledge	Short term decisions
			Inability to disaster understanding
			Relying only on experiences
			Unawareness of the plans
		Out of date technology	Defection of communication infrastructures
			Uncomprehensive data bases
			Inefficient usage of a hospital information system
			Disliking to use new technologies
	Defection of programs and processes	Variety of assessment programs	Variety of hospital assessment tools
			Obscure hospital standards
			Repetition of indexes
			Miss-monitoring the healthcare services
		Requirement to plan's revision and modification	Not updating the plans
			Ambiguity of activities procedure
			Imperfect analysis of events
			No attention to experiences
		Disorganised resources	No operational plan to manage emergency resources
			Lack of operational plan to manage drug
			No operational plan to utilise resources

[Table/Fig-3]: Codes, categories and subcategories of theme "Lack of Preparedness".

One of the participants who is a hospital manager said, "While team working is extremely important in disaster management, our forces usually dislike cooperation with each other to handle the disaster situation. They believe that they should handle their assigned tasks alone as it is in normal situation and are severely confused. This becomes more irritating when two or more individuals aim at managing the disaster situation. The lack of harmony is clearly seen in/between different levels of the disaster group management team. Specially, in such a stressful and critical situation, the management group is completely confused".

Having adequate knowledge of different aspects of a disaster helps the heads of a disaster management team to design the best plans as well as to make the best and on time decisions to handle the disaster situation. Establishing periodic classes to update the knowledge of the individuals in different levels of the disaster management team like managers, matrons, supervisors, doctors, and even nurses about the new findings, techniques and methods; new decisions and designed plans in this field are essential to manage the extremely critical situation. This must be kept in mind by the high level hospital disaster managers who make the key decisions. However, such an important issue is mostly neglected among the staffs at different levels in the disaster handling team.

Another problem with preparedness of the hospitals when a disaster occurs is designing inefficient, unclear and uncompleted plans and processes proportional to the properties of each hospital, such as its size, and type of services.

It is clear that the programs need to be revised and modified periodically based on the new experiences of the hospital in recent events, or new experiences of the other hospitals, new technologies and methods to face with disasters.

Unfortunately, disaster committee does not like to change and improve the plan. Executive members have also accustomed to the current plans and dislike any changes. Scrupulous analysis of recent events aids to reflect the new finding in the new plan, thereby removing the ambiguity in activities and procedures that are important to modify the plan.

Non-Coherent Function

Inefficient response category is also subdivided into three subcategories as follows: Inefficient Organisation, inter-organisation coordination obstacles, and deficient management. To improve the performance of each system, different parts of the system must be organised carefully. About a hospital, structure (such as buildings), staff (such as personnel at different levels), and equipment must be well organised.

One participant said: "Although surging the capacity of staff, equipment, and structure significantly helps the managers to handle the disaster situation more easily, however does not guarantee to achieve a resilient hospital. Therefore, organising the resources of the hospital, and providing a system to control the disaster handling process as well as surging the resource capacities must be provided".

Hospital is a complex organisation including several connected management layers. To each layer is assigned several tasks. To handle the disaster situation, a complete and efficient coordination must be provided to connect the layers. Furthermore, to manage the disaster, a hospital needs to communicate with some other organisations (e.g., police, emergency medical center, other hospitals, red-crescent, and etc.,) to receive services. Lack of clear inter-organisation rules and so inefficient inter-organisation cooperation significantly degrade the performance of the hospital in disasters. [Table/Fig-4] shows the

Main concept (Theme)	Category	Subcategory	Code
Non-coherent function	Inefficient response	Inefficient organisation	Disorganisation of staff administration
			Challenges in surge capacity for emergency beds
			Absence of a process control system
		Inter-organisation coordination obstacles	Lots of coordination layers
			No inter-organisation cooperation
			Lack of clear inter-organisation laws
			Inefficient inter-organisation collaboration
		Deficient management	Imposing unnecessary processes
			Conflicts of different managers in different levels
			Inconsistent commands
			Not executing the prepared plans
	Information mismanagement	Inefficient procedure of information exchange	Inaccessible information of events
			Report registration and exchange is paper-based
			Unclear information transmission process
			Lots of data bases
		Weak information analysis	Incorrect prioritising critical activities
			Information of supporting medical centers is not available
			Inaccessible medical history
			No good early warning system
		Imperfect communication management	No on-time communication
			Lack of information technology
			Lack of a unique supervision system
	Incomplete resource provision	Challenges in resource allocation	Inaccessible equipment
			Inflexible rules
			Not available a resource distribution and rationing protocol
		Challenges in resource provision	Lack of a good prediction and prioritising
			Unpredictable
			Not enough medical equipment

[Table/Fig-4]: Codes, categories and subcategories of theme "Non-coherent Function".

codes from which categories and subcategories of theme "Non-coherent Function" are extracted.

Another issue that severely affects the resiliency of the hospital in disaster is incomplete resource provision and allocation. Predicting the required resources for disaster management and providing them, keeping the resources ready and accessible all the time, estimating the amount of required resources, and designing a resource distribution and rationing protocol are several essential resource management issues affecting the disaster resiliency of the hospital.

Continuity of Essential Services

The main aim of a resilient hospital is to continue to the essential services (or its normal operation) when a disaster occurs. Designing local and state plans, analysis of the requirements and modification of response process, expediting service provision, and finally designing a hospital surveillance system are the four main categories into, which the theme of continuity of essential services are divided into. Identifying the essential requirements of a resilient hospital such as structures (i.e., buildings), equipment, and staffs and surging the capacity of these requirements is one of the most important issues to improve the resiliency of the hospitals. [Table/Fig-5] shows the codes from which categories and subcategories of theme "Continuity of Essential Services" were extracted.

To do so, in the first step, the essential activities are identified. Then the activities are prioritised. Based on the priority of the activities and the capacities of the hospital, some activities (with higher priority) can be performed. However, there is no enough resource to do some others. In such cases, the first solution is the optimal usage of the available resources (e.g., some unnecessary services must be canceled to provide more resources for more important activities) and the next one is providing extra capacity building. One solution to surge the capacity is providing the duplication for each resource (resource redundancy), like drugs, physical space (bed management), equipment, staffs (on-call personnel), and etc. Another problem with continuity of essential services is the weakness of providing services by the staffs.

One participant said: "In disasters, when the patient load is more than the capacity of the hospital, we immediately try to provide extra capacity. To do so, we first transfer the injured people to the hospital units having the free rooms (or beds). If there is no free room, we use free physical spaces such as courtyards, corridors, and so on to accommodate the injured people. Otherwise, we need to coordinate with other supporting hospitals to use their capacities"

Emotional Response

As mentioned earlier, disaster situation is extremely stressful and scaring. Injured and affected individuals refer to the hospital for receiving healthcare services, and psychosocial assistance, while they are very excited, emotional, afraid, disturbed and completely confused. This emotional situation significantly affects the behaviour and decreases the performance of disaster management team.

When the atmosphere of the hospital is such emotional, the first outcome is that the decision makers cannot have a precise and realistic estimation of the size and other features of the disaster. Therefore, they are not able to approximate the amount of required resources (such as equipment, bed, physical space, personnel, and etc.,) to handle the disaster situation, and there by unrealistic plan is designed to manage disasters. [Table/Fig-6] shows the codes from which categories and subcategories of theme "Emotional Response" are extracted.

Main concept (Theme)	Category/Subcategory		Code
Continuity of essential services	Designing local and state plans		Localising the protocols
			Localising the hospital plan
			Localising individual capabilities
	Requirement analysis and modification response process	Identifying critical elements	Prioritising activities
			Utilising accessible resources
			Canceling unnecessary (elective) services
			Extra hospital capacity building
		Physical surge capacity	Strategy of increasing emergency space
			Supporting space provision
			Bed management
			Planning for using supporting capacities
			Relocate (if necessary)
		Developing equipment and Infrastructures	Up to dating equipment
			Correct use of equipment
			Checking for equipment availability in disasters
			Surging paraclinic capacities
			Higher Priority to equipment of critical sections
	Expediting service provision	Increasing capabilities	Standardisation of job skills
			Enhancing skills of administrators
			Organising teams of experts
			Continuous professional education
		Reinforcement of Internal coordination	Combination of systems
			Personnel recall procedure
			Volunteer management
			Improving personnel recall system
	Hospital surveillance system		Identifying assessable parameters
			Establishing medical care system
			Centralised assessment of medical care centers

[Table/Fig-5]: Codes, categories and subcategories of theme "Continuity of Essential Services".

Main concept (Theme)	Category	Code
Emotional response	Overestimating in disaster level	Unrealistic estimation
		Experience-based estimation
		Emotion inspired by media
	Emotional reaction	Emotional decision making
		Individual (non-group) decision making
		Disproportion of provided services and patient load
		Non-unified management
		Aggressive management
	Administration by higher level managers	Defective available potential
		Inefficient prioritising
		Late and incomplete recovery

[Table/Fig-6]: Codes, categories and subcategories of theme "Emotional Response".

One participant said: "When an accident occurs, the people who are in the scene are very confused and extremely emotional. So the information that they provide (when they contact to EMS) are usually exaggerated. Furthermore, the forces of EMS that go to the scene does not provide good and complete information due to the emotional atmosphere of the scene. Therefore, the information that is provided to the hospital does not reflect the exact situation of the event. Therefore, the hospital cannot estimate the exact required resources to handle the situation".

In these situations, the disaster management team must perform based on its experiences in previous disasters, and this estimation is also not very exact. Furthermore, due to the irregularity of the management process and disability of the managers for disaster handling process, the managers are usually very aggressive and management process is non-unified.

Developing Functionality

There are many plans designed for disaster management in general. However, hospital disaster management program must include some specifications that are extracted based on the requirements of hospital. Flexibility of the designed plan is one of the most important features of the plan. [Table/Fig-7] shows the codes from which categories and subcategories of theme "Developing Functionality" are extracted.

Main concept (Theme)	Category/Subcategory	Code
Developing functionality	Reinforcement of on-demand plans	Reinforcing contingency plans
		Verifying and updating safety plans
	Designing efficient plans	Purposeful exercises
		Designing professional scenarios
		Lesson-learned plan modification
		Flexible plan
	Prioritising emergencies in plans	Identifying critical elements
		Prioritising the requirements

[Table/Fig-7]: Codes, categories and subcategories of theme "Developing Functionality".

One of the participants said: "The requirements of the hospital management must be first identified, and then the plans are designed for covering these requirements. In most cases, some general plans are designed and dictated to all organisations to perform them when a disaster occurs, while such plans do not support the requirements of hospital management in disasters completely. Furthermore, obviously hospitals are different in size and type of services and many other parameters. Therefore, each hospital has its own specifications and requirements. That is, to achieve the best results in hospital disaster management, the disaster plans must be designed based on the demands of the hospital".

Non-Resilient Confrontation

One of the most important reasons for inefficiency of the hospital disaster team is not enough attention to assessment of the requirements of a hospital to be resilient. This suggests the requirements are not clearly identified, and therefore not well managed. Furthermore, either disaster assessment is not correctly done or its results are not reflected to the hospital disaster plan for future. The codes from which categories and subcategories of theme "Developing Functionality" are extracted are shown in [Table/Fig-8].

Theme	Category/subcategory	Code
Non-resilient confrontation	Unrealistic assessment	No attention to rapid assessment of results in planning
		Inefficient assessment of requirements
	Power orientation	Planning unbelief
		Personal and non-professional activity
	Performance reduction	Low quality of service
		Lack of bed
		Lack of clear mechanism
	Structural damage of hospital	Damage of units
		Not enough space for surge capacity
	Delay in recovery	Financial problems to provide equipment
		No professional recovery group
		Lack of an efficient recovery protocol
	Distrust to hospital	Inefficient disaster management
		Weak service providing for injured
		Severe dependence of the hospital to the other organs

[Table/Fig-8]: Codes, categories and subcategories of theme "Non-resilient confrontation".

One participant said: "Disaster situation is very stressful. Team working in such situations, when managers are confused and nervous, is very difficult. Therefore, disaster handling managers who are responsible for conducting the disaster prefer to conduct the team solely based on the personal decisions rather than following the predefined plans".

DISCUSSION

In disasters, hospitals are the first places providing vital and healthcare services, shelter, food, water, psychosocial assistance, and many other services for injured and homeless people, and so they must be very safe and highly reliable.

In fact, after a disaster, when everything has been messed up, people are completely confused, and life routine has paused, the hospitals not only must continue their routine services, but also they must provide many other services. That is, a disaster resilient hospital should be enough resistant to disaster such that it continue its routine services (even in larger size) during disaster, even if the hospital itself is directly affected by the disaster [8,9].

In this study, resiliency of the hospitals of Iran was examined, and the challenges to make a hospital resilient were identified. Findings show that lack of hospital preparedness to face with disaster situation, weak and non-coherent functionality of the hospital after a disaster, non-continuity of vital and healthcare services are the main challenges of the hospital for disaster resiliency. Moreover, psychological problems caused by disaster; results in emotional behaviours and emotional reactions of both injured and disaster management team. This significantly reduces hospital resiliency in emergencies and disasters. Conserving the normal operation of the hospital or returning the situation to the normal state is

the main objective of the resilient hospital in disaster [6]. In what follows, the challenges avoiding a hospital to be resilient are discussed in detail.

Lack of preparedness of a hospital to face with the disaster situations is one of the most important problems in making a hospital resilient. Not having an up-to-date and comprehensive plan to manage the difficulties is one of the reasons for lack of preparedness.

In many studies such as [6-12], the importance of the preparedness of the hospital in disaster is discussed. However, in this study, findings show that in many cases, disaster management team does not believe that the disaster plan is not comprehensive and require to be modified. Inadequate knowledge of the hospital resources and facilities, disaster handling process and plan also decreases the resiliency of the hospital due to the lack of preparedness.

As Zhong S et al., discussed, the process of hospital disaster management needs a team work. However, our findings showed that the team members do not like to co-operate with each other to handle the disaster situation and this is another reason for un-resiliency of the hospital. Inefficient responsibility of the hospital is another indication shows the hospital is not resilient. Inefficient organisation, inter-organisation coordination obstacles, and deficient management are several symptoms for inefficient responsible hospital [9,11].

The obtained results of this study conducted on the hospitals of Iran also show that incomplete resource provision and allocation are two reasons for inefficient function of the hospital. Prediction of the required resources and providing them, keeping accessible the resources, and designing a resource distribution and rationing program help disaster management team to provide required resources for handling disaster situations [18].

Continuity of the essential services is the most important feature that a resilient hospital must provide. A hospital is disaster resilient if it can continue its normal operation, even when the hospital is affected by the disaster [7].

Sorensen BS et al., showed that surging the capacity of all resources (staff, stuff, and structure) significantly improves the resiliency of the hospital in disaster situations [17]. Recalling the personnel, using extra beds, rooms, and buildings provided, and duplicated equipment help us to tolerate the disaster situation easier, when the activities are prioritised base on their importance. When a heavy load of the injured people are referred to the hospital to receive the healthcare services, considering the priority of the required activities (based on the patient state) and handling them based on the prioritisation helps the disaster management team to tolerate the disaster situation very easier [18].

The conducted studies showed that the next issue (as a future research) that must be considered is that disaster situation is extremely stressful and emotional. Injured people who are very excited, emotional, disturbed and confused are referred to hospital, and the disaster management team must initially control such an emotional situation, otherwise, they cannot perform well. In most cases, personnel are also emotionally affected [21].

Findings also show that, although general hospital disaster management plans that are designed by the disaster committee and dictated to perform in different hospitals are useful in many cases. However, due to the fact that each hospital based on its size, services, place, etc., has different characteristics and so various requirements, therefore, the plans must be designed for each hospital based on its specifications. Furthermore, an efficient plan must be flexible. This is because specifications of a disaster cannot be predetermined completely. Therefore, it is required that disaster managers can easily change different parts of the plan based on the condition and during the disaster handling process [22].

Identification of the requirements of a resilient hospital, realistic assessment of the requirements, and finally reflecting the results of the assessment process to the hospital disaster management in future is an important procedure to improve the resiliency of the hospital. However, one of the key weakness points in executing the disaster plans, in such stressful situation, is that the managers dislike following team working plans, and prefer to manage situation based on the personal decisions. Obviously, this significantly reduces the hospital resiliency.

CONCLUSION

This study aimed at exploring the challenges for disaster hospital resiliency in context of Iran. Findings showed that lack of preparedness, non-coherent function, non-continuity of essential services, emotional response, developing functionality, and Non-resilient confrontation are the main challenges the hospital managers are encountered. The obtained results showed that the preparedness level of the hospitals significantly must be improved. Moreover, all requirements of the hospital to continue its normal operation (when a disaster occurs) must be identified and the capacities are surged based on the requirements. Furthermore, findings show that emotional behaviours and responses are forbidden during disaster handling process. In this study, the challenges of resilient hospital considering all phases of disaster management were scrutinised. This field is very wide considering all preparedness, response and recovery phases of disaster management. Therefore, many future studies can be conducted. As a future research, exploring the challenges of continuity of essential services is recommended. Moreover, verifying the effects of emotional behaviour in disaster is needed. Also, conducting researches to consider the reasons for unbelief to planning by managers and unbelief to plan modification could be very helpful.

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