# Influential factors of healthcare provider resilience in disasters: A thematic analysis

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## ABSTRACT

**Objective**: To identify the influential factors of healthcare staff resilience in disasters.

**Methods**: In this qualitative study, the influential factors of healthcare staff resilience in disasters were investigated through interviewing 20 experts. The interviews were conducted face-to-face, and MAXQDA software version 10 was used to organize the data and thematic analysis.

**Results**: The participants included 5 medical emergency technicians, 5 physicians, 2 Red Crescent technicians, and 8 nurses. The main influential factors of healthcare providers' resilience were limited relief infrastructure, supportive empowerment, organizational capitals, and contradictory consequences. Other important factors were resource limitation, confusion and uncertainty, empowerment training, comprehensive support, human and value capital, social capital, physical capital, suffering, disability, calm, and excellence.

**Conclusion**: Improving healthcare providers' resilience can be achieved by reducing uncertainty, providing the physical, economic, and human resources, strengthening motivation and comprehensive supports. It is suggested that disaster managers consider all identified dimensions to improve the resilience of healthcare providers to serve better in disasters. Moreover, researchers should study each dimension to provide profound knowledge regarding resilience in disasters.

**KEYWORDS:** Resilience; Influential factors; Disaster; Health care provider; Thematic analysis

# 1. Introduction

Some professions are exposed to a high risk of stress that can threaten their mental health[1]. Evidence shows that prolonged exposure to stressful conditions, sometimes lasting weeks or months, causes undesirable physical and mental outcomes[2]. People who face stressful situations can manage critical situations by improving their intellectual and personal capacities; the process is called post-traumatic growth[3]. Therefore, it is necessary to pay attention to the level of individual and psychological capacities through which a person can withstand bad conditions, avoid injuries and improve performance.

In times of crisis, healthcare centers are one of the places that are overwhelmed and will face a proliferation of requests for health services[4]. Given that, healthcare providers are among the first group to respond to crises. These persons face the most psychological stress during and even months after a crisis[2]. Healthcare providers, including nurses, physicians, and emergency

**Significance**

Improving healthcare provider resilience can be achieved by reducing uncertainty, facilitate physical, economic, and human resources, strengthening motivation, and comprehensive supports.

technicians, are exposed to professional challenges for some reasons like managing multiple patients, the relationship with their colleagues, emergencies like disasters, and job burnout. Thus, these professionals require adequate knowledge and suitable communication in the workplace to diminish the effect of these challenges[5]. Due to the high mortality rate of sudden disasters, providing appropriate healthcare is one of the main factors affecting the survival of injured people and reducing death. That is why trained and flexible personnel is so important to ensure high-quality services when faced with disaster[6].

Besides the prevalence of man-made and natural disasters, terrorist events keep increasing. In this regard, improving the mental and physical health of medical and relief personnel is essential to respond to the heavy burden of these events. To do it, one of the effective strategies is promoting the resilience of healthcare providers[7]. Nowadays, the resilience capacity has become more important during the COVID-19 pandemic, especially for healthcare providers. COVID-19 showed that in addition to physical health, mental resilience is needed to withstand the crisis. In this pandemic, the healthcare personnel, as the frontline of combating the disease, were exposed to the greatest amount of mental and physical stress. Factors such as unclear transmission process, direct contact with COVID-19 patients, unclear treatment process, and high demand for medical services have increased the mental and physical stress of the healthcare staff. Most healthcare staff have suffered from severe burnout during this period, and high resilience can keep the doctors and nurses from work burnout[8].

Recent studies show a high prevalence of psychological symptoms in medical personnel regarding COVID-19, including depression, insomnia, confusion, and post-traumatic stress disorder, which are similar to the disorders among war veterans. These complications negatively affect the well-being of the healthcare staff, as well as their ability to provide suitable services. At the other end of the spectrum, people with good resilience showed a better performance amid the situation[9]. Health workers who fighting COVID-19 didn't have the same degree of complications, and their symptoms depend entirely on their resilience as a protective factor. The personnel with good resilience are less irritable, have a better interpersonal ability, fewer headaches, and lower depression[10]. Therefore, increasing the resilience and operational capacity of healthcare staff can significantly reduce the negative effects of disasters[11].

Resilience is not a new concept in the field of disaster management and has been receiving more attention in recent decades, especially in the United States. The main reasons are the severe storms like Katrina and the earthquakes in Japan and Nepal, in which many people died, and the economy was severely damaged[12]. Thus, it is necessary to limit the effects of the disaster by diminishing the risk and strengthening resilience capacity. Resilience means the ability to return to the first state after a shock or catastrophic situation[13]. Resilience is a dynamic process and can be enhanced in people using appropriate strategies[14].

Healthcare providers are the most effective foundation of care in times of crisis. Based on their professional tasks, they have the responsibility of treating and caring for people physically and mentally. Lack of suitable and adequate relaxation and well-being

for healthcare personnel leads to physical and mental disorders that reduce their resilience and disrupt their lives. If these disorders are left untreated, they cause declined performance in the crisis[15]. Promoting resilience increases the individual's ability to adapt to stressors[16]. The current study aims to identify the main influential factors on healthcare providers' resilience in disasters. The results of this study can provide a roadmap for disaster managers to improve their personnel resilience.

## 2. Patients and methods

### 2.1. Participants

In this qualitative study, 20 experts were recruited based on purposeful and heterogeneous sampling. Supplementary Table 1 shows the number and characteristics of participants in the study. Inclusion criteria were (1) facing at least one crisis that occurred in Iran; (2) availability and responsiveness; (3) having the scientific outputs published in the field of disasters.

### 2.2. Measures

The mobile phone voice recorder was used. The interview guide was designed based on the literature review and the research objectives for the semi-structured interviews. We used a semi-structured interview schedule to allow flexibility, individual contextualization, and probing of issues provided[17]. The interview guideline was used to collect data. The research team removed the shortcomings of this guideline. The guideline consisted of 12 questions of main factors, and solutions for improving resilience in healthcare workers in disasters. Demographic information form also was used to record the participants' details (Supplementary Table 2).

### 2.3. Procedures

We interviewed 20 experts face-to-face at their workplace from August 2020 to March 2020. The interviews were audiotaped with the prior consent of all participants and transcribed verbatim. This study is the result of the second phase of a doctoral thesis entitled "A model for improving the resilience of healthcare personnel in a disaster" and the Ethical approval was obtained from Iran University of Medical Sciences, Tehran, Iran (No. ir.iums.rec.1399.344). The time allocated for interviews ranged from 35 to 55 min. The interviews continued until the data was saturated. The participants that didn't like to continue the interview, were excluded from the study.

### 2.4. Data analysis

Data were analyzed by two coders using qualitative content analysis from Graneheim *et al.*[18] and a conventional approach. In this approach, the researcher collects the related information based on research objectives through open-ended questions. It tries to present a new and accurate insight of the subject in the form

of a conceptual model with a deep and accurate understanding of provided information. This model is a simpler expression of the presented fact that is to be generalized. Both coders separately read 20 of the transcripts entirely, several times, to familiarize themselves with the data and to identify emerging themes by which the data could be examined. Both coders discuss the findings to resolve differences. Based on these analyses, the coders developed a thematic framework. All transcripts were coded using this thematic framework independently by the two coders. Results were discussed to fully reach a consensus, following which themes were refined and subthemes were identified. The final step includes reviewing what could be used to make sense of the identified themes and subthemes. MAXQDA version 10 and thematic analysis were used to organize and analyze the data. So, the influential factors on healthcare workers' resilience in disasters were extracted and re-categorized based on semantic similarity and thematic overlap. The interviews were coded with the letter "I" and the number to maintain the confidentiality of the data. We have reported the main and sub-categories of these factors in the results.

## 3. Results

The participants in this study included 5 medical emergency technicians, 5 physicians, 2 Red Crescent technicians, and 8 nurses. Their age was (39.85±6.27) years. Two medical emergency technicians had an associate degree, three had a bachelor's degree, and two Red Crescent technicians had a bachelor's degree in the rescue field. Two physicians as top managers and two nurses as middle-level managers had attended in the previous disasters. These participants had been in the affected area for at least one year. The influential factors on healthcare workers' resilience in disasters are presented in Table 1.

The data analysis leads to 4 categories, 9 sub-categories, 23 sub-subcategories, and 128 codes. The main factors that improve the resilience of healthcare providers were limited relief infrastructure, supportive empowerment, organizational capital, and contradictory consequences. Each factor has been explained below.

### 3.1. Limited relief infrastructure

The main sub-categories under this category are resource constraint, confusion, and uncertainty. Regarding the resource constraint, physical resource constraints like lack of relief equipment and infrastructure, and human resource constraints like lack of efficient and trained relief workers are the most important factors affecting the promotion of resilience.

*"The number of ambulances in the area was very limited, and it didn't meet the needs of injured people." (I2)*

*"There was no protective equipment for the staff, for example, they gave us a mask for a week, and on the other hand, it was recommended that the mask should be changed every 12 hours." (I9)*

*"The personnel were not ready to deal with such an incident and the number of deaths shocked everyone." (I2)*

*"We did not have trained manpower. The personnel were unprincipled*

*and confused especially in the early days." (I6)*

The most important factors regarding confusion and uncertainty were shock and confusion in relief workers and people, unfamiliarity with the disaster area, and disorganization as lack of an action plan to deal with a disaster. These factors affect resilience in healthcare providers.

*"Everyone was shocked to see this amount of damage, injuries, and deaths." (I18)*

*"When we wanted to transport the injured, we did not know the routes, especially in the first days, and sometimes it caused us to arrive at the field hospital with a delay." (I17)*

*"For such crises, it must be planned and taught in advance so that everyone knows her/his duty." (I16)*

### 3.2. Supportive empowerment

This category includes empowerment training and comprehensive support. One of the influential factors on healthcare providers' resilience is empowerment training. It requires training both healthcare staff and people who are present on the scene to cope with disaster. Also, they must practice resilience and empower themselves spiritually.

*"In my opinion, personnel who knew more, are more resilient and understood the situation better" (I7)*

*"Many times people can assist more in a disaster because they are present there and had been informed through various means such as the media" (I13)*

*"One of the things that make a positive impact on persons is practical training in the form of maneuvers that prepare them mentally and physically for such situations" (I6)*

*"Only trusting in God could make it easier for us to endure that situation…" (I12)*

The participants also talked about providing comprehensive support for both healthcare staff and people in disasters. It needs to support them psychologically, economically, informationally. These supports can empower healthcare workers and people in the affected area in a positive way to deal with the disaster.

*"I think preparing a team for critical times, especially through psychological counseling and strengthening their morale can improve their resilience in such situations" (I6)*

*"Why is no financial or payment difference between me, who deals directly with Corona patients, and someone who does not deal with these patients at all?" (I15)*

*"Having a map of the area can be very helpful…" (I18)*

### 3.3. Organizational capitals

Another factor that affects healthcare providers' resilience is organizational capitals. This factor includes human and value, social, and physical capital. The participants pointed out that sacrifice and self-devotion, self-management, and previous disaster experience of healthcare workers can empower their resilience in disasters.

*"In those circumstances, I did not feel tired at all, and we only worked continually in the hope that we could save more people" (I1)*

*"We tried to control ourselves in those situations and not let these stresses overwhelm us or make us inefficient" (I4)*

*"Colleagues who already have experienced earthquakes better understand and manage the situation." (I4)*

The participants said that social capital like the interpersonal, team, and interdepartmental relationships and collaborations in disasters can improve healthcare providers' resilience.

*"The presence of the officials and their relationship with the staff was very inspiring in my opinion and the motivation to work was more…" (I12)*

*"If there was unified management of the Red Crescent and the emergency services, it would be much better to provide relief in this situation." (I3)*

Another main factor that also affects the resilience of healthcare staff in a disaster is providing technology, equipment, and other physical resources to deal with the situation.

*"Software such as masks, if used properly, could be very effective in tracking and controlling patients, and preventing further spread of the disease." (I8)*

### 3.4. Contradictory consequences

Suffering and disability of healthcare personnel and calm and excellence are contradictory consequences that healthcare providers experience in disasters. The participants said that mental exhaustion and physical disability are the most complications that healthcare providers face in disasters.

*"Seeing these scenes caused me to be mentally disturbed and, I did not sleep at night at all. I had nightmares …" (I7)*

*"After all these years since the earthquake, I still have very severe headaches that start especially at night and do not allow me to sleep." (I16)*

The participants said that disasters have positive consequences alongside negative ones. Personal growth and spiritual peace of health workers, and also organizational growth because of providing a comprehensive and effective management plan for the disaster are the positive outcomes. These organizations gain numerous experiences that can be useful for other crises.

*"The thing that made me feel good and motivated me was that I could rescue a person, and this must be pleasing to God." (I20)*

*"Having a unified leadership and specialized support of the organization, such as specific guidelines or roadmap in times of crisis, improves the quality of relief work." (I18)*

*"I think that working in such a situation requires a kind and compassionate person, otherwise, no one can tolerate this situation." (I15)*

## 4. Discussion

This study aims to identify the main effective factors on healthcare providers' resilience in disasters. Four main factors were determined, including limited relief infrastructure, supportive empowerment, organizational capitals, and contradictory consequences. Regarding limited relief infrastructure, resource constraints and confusion and

uncertainty had the most important effect according to the experts' view. Similarly, Huffman *et al.* assessed the impact of the COVID-19 pandemic on the psychological well-being of medical providers, medical trainees, and administrators at a large academic center. Like our study, their survey revealed that higher resilience is associated with lower stress, anxiety, fatigue, and sleep disturbances. Aid by medical departments and institutions, contingency plans, and personal protective equipment can improve healthcare workers' resilience[19]. Overall, it is necessary to provide adequate physical and human resources as suitable infrastructure, equipment, hospitals, diagnostic devices, and trained personnel with sufficient mental readiness to cope with disasters[20,21].

Besides, in a disaster, both people and healthcare providers encounter confusion and uncertainty that result from unfamiliarity with the area and disorganization. It requires diminishing this confusion in damaged people and health workers by giving calm to people, increasing awareness about the area, operational plan, roadmap, and job description for relief workers. The participants concluded that these strategies lead to accelerating relief in that place. We didn't find similar evidence regarding these items that should be investigated in future research.

Another factor that influences the resilience of healthcare workers in disasters was supportive empowerment including empowerment training and comprehensive support. For empowering persons in disaster, people and relief workers must be trained and practice resilience, and be empowered spiritually. Increasing the knowledge of relief workers and previous education regarding disaster relief, having job descriptions and problem-solving skills promote their resilience ability. So, relief training is the key to success in rescuing fellow human beings. Also, educating people in disaster helps their successful relief and resilience, which can be provided by social media and mass media. On the other hand, relief workers must use previous educational experiences to help fellow human beings, even with physical injuries. This can be provided by simulating real situations like holding maneuvers to prepare and strengthen teamwork. Relief maneuvers can strengthen coordination between institutions. Several studies revealed that educational interventions can improve healthcare providers' resilience[20,22,23]. These studies differ from our research as most of them are review and introduce effective factors on healthcare workers' resilience in all situations as normal or disaster days. A study by Weidlich *et al.* showed that the Care Provider Support Program is effective in reducing burnout, which often leads to decreased compassion fatigue in a group of military and civilian registered nurses, licensed practical nurses, and medics, though it didn't affect resiliency scores or coping scores[24]. But most of these studies revealed that resilience training is the main factor that must be considered by health managers in different situations especially disasters.

Also, psychological, spiritual, economic, and informational supports are necessary to improve the resilience of healthcare workers in disasters. In this regard, suitable emotional communications between team members, pay attention to the mental and physical health of the relief team after the crisis, specialized psychological support to help with post-trauma resilience, sharing experience and memories by relief workers to other colleagues, relieving staff stress, using

of interdisciplinary practice, presence of clerics and religious counselors in disaster place, empathy, and sympathy with the injured people, following health state of relief workers continually, self-management can maintain a strong resilience in difficult situations. Other researchers also implied the psychological intervention to improve healthcare providers' resilience[25-27]. Seppala et al. pointed out that psychological interventions like loving-kindness meditation may be a viable, practical, and time-effective solution for preventing burnout and promoting resilience in healthcare providers, and for improving the quality of healthcare[25]. But spiritual interventions such as the presence of the clergy have not been studied by other studies. So, it suggests that the effect of spirituality on healthcare workers' resilience and people involved in disasters should be investigated in future studies.

Additionally, economic support of healthcare workers' families during the mission, providing welfare services and basic living facilities, paying attention to the health and hygiene of the living environment of the relief forces, financial encouragement by officials, adequate sleep, and proper nutrition, an advance roadmap and getting information about the disaster place from a local leader, and the presence of a person aware of the dangerous situations in the area are other main factors that can improve resilience. Albott et al. referred to some of these factors as mobilization of personal protective equipment, intensive care beds, and medical equipment[27].

Other effective factors on healthcare providers' resilience based on the participants' views that are not considered by evidence are organizational capital including human, social, and physical capital. In disaster, sacrificed relief workers are ignoring their mental health to help human beings and providing services outside of their professional duties. They are trying to adapt to the situation to save lives and create a self-sacrificing relief cycle and try to cope with the situation, maintain the privacy and dignity of the injured persons. Providing services is a way to self-management of their mental conditions. The previous experience dealing with crisis influence their tolerance and resilience. So, it is suggested that experienced persons will be selected for wide and severe events.

Also, disaster managers must pay attention to improving communication between health workers and officials in a way that increases their motivation to work better. Proper cooperation between different institutions can improve service quality injured people and create empathy of healthcare workers for understanding and helping each other. Physical capital is another effective factor in resilience includes providing appropriate facilities and technology for information sharing and track injured patients in a disaster. This factor accelerates the management in an emergency and reduces healthcare workers' stress by receiving suitable information regarding damaged places, the number of injuries, and the location of the nearest health centers. Brooks et al. reviewed the literature to investigate factors affecting the psychological well-being of disaster relief workers. They found that pre-deployment factors (preparedness/training); peri-deployment factors (deployment length/timing, traumatic exposure, emotional involvement, leadership, inter-agency cooperation, support, role, demands and workload, safety/equipment, self-doubt/guilt, and coping

strategies) and post-deployment factors (support, media, personal and professional growth) are the main factors that affect the relief workers' resilience. Humanitarian organizations should prioritize empowering relationships between team members and supervisors, and dealing effectively with non-role-specific stressors, to improve the psychological resilience of their workforce[28].

On the other hand, disasters have some contradictory outcomes like mental burnout, physical disability, spiritual calm, organizational excellence, and individual excellence. Relief workers experience decreased mental strength in disasters due to lack of equipment and disruption of relief, seeing the death of a large number of people, weakness in stress management, job burnout, and future mental and physical disorders due to recalling memories in the past relief mission[27]. In contrast, experience from disasters gives spiritual calm, feeling of being useful, good sense of communication with fellow human beings and providing services, and finally work satisfaction. This calm leads to compassion and kindness, balance in actions, ability to communicate with others, and having a charismatic personality[25]. Another contradictory outcome based on the participants' view is organizational excellence that influences healthcare workers' resilience because of relief strategic plans and effective leadership. These factors can improve relief processes, correction of programs and policies, reduce mortality, increase the quality of services, and reduce the cost of crisis for the organization. Overall, comparing the results of our study with other research showed that the identified factors are more than those suggested by other researchers. Published studies have focused more on psychological resilience, resilience training, the organization's ability to cope with crises, and organizational cooperation. Factors like economic support, spiritual resilience, and the consequences of crisis management have not yet been studied by others. The previous studies investigated the main factors of healthcare workers' resilience by systematic review and survey regarding all situations not only disasters. While the present study tried to identify all the factors affecting the resilience of healthcare workers with a qualitative and comprehensive approach. However, we encountered some limitations that the main limitation was the lack of participation of some experts in the interview, in which they introduced other people to the interview. It is suggested that researchers examine the identified factors that are less considered by other studies in crises and provide the essential interventions to improve the resilience of healthcare workers. Because most of the introduced interventions are of a psychological and educational type and less attention has been paid to other factors.

To sum up, the main effective factors on healthcare workers' resilience are limited relief infrastructure, supportive empowerment, organizational capitals, and contradictory consequences. Improving healthcare providers' resilience can be obtained by empowering them through reducing uncertainty; providing physical, economic, and human resources, strengthening motivation, calm, and finally comprehensive supports. It is suggested that disaster managers consider all identified dimensions to improve the resilience of healthcare providers and serve better in disasters. Also, researchers are recommended to study each dimension to provide profound knowledge regarding resilience in disasters.

## Conflict of interest statement

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## Authors' contributions

All authors were equally contributed in providing research idea, collecting and analyzing data, and writing and finalizing the article.

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