

# Factors affecting the resilience of hospital medical staff during the COVID-19 pandemic

HAMID JAFARI<sup>1, A, B, D, E</sup>, MOHAMMAD HEIDARI<sup>2, A-C, E, F</sup>, REZA SADEGHI<sup>3, C, D, G</sup>,

ORCID ID: 0000-0002-9632-4338

ORCID ID: 0000-0001-7767-5645

ORCID ID: 0000-0002-5162-6316

MAJID HEIDARI-JAMEBOZORGI<sup>3, A, B, D</sup>

ORCID ID: 0000-0003-4792-2718

<sup>1</sup> Department of Medical Emergencies, Sirjan School of Medical Sciences, Sirjan, Iran

<sup>2</sup> Community-Oriented Nursing Midwifery Research Center, Shahrekord University of Medical Sciences, Shahrekord, Iran

<sup>3</sup> Department of Public Health, Sirjan School of Medical Sciences, Sirjan, Iran

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**Summary Background.** During the coronavirus disease 2019 (COVID-19) pandemic, most hospitals have faced a heavy load of patients. In this situation, it is very important to consider the resilience and endurance of medical staff, as well as to identify and investigate the relevant factors which can increase their resilience.

**Objectives.** The aim of this study was to identify the factors affecting the resilience of hospital medical staff during the COVID-19 pandemic.

**Material and methods.** The present study is a qualitative study using a semi-structured interview. Participants included doctors, nurses, clinicians and managers working in tertiary referral hospitals during the COVID-19 pandemic. Interviews were conducted as needed until data saturation was reached using the purposive sampling method. A total number of 20 people, including 6 physicians, 2 hospital managers, 7 nurses, 1 radiologist, 3 laboratory technicians and 1 clinical psychologist, were interviewed in 7 educational hospitals of the Kerman Province.

**Results.** After data analysis and coding, 127 initial codes were identified. By reviewing the codes, 127 initial codes were merged by the research team, and 23 codes in 6 main categories, including Personal Factors (7 codes), Family-Related Factors (2 codes), Community-Related Factors (2 codes), Virus-Related Factors (2 codes), Organisational Factors (7 codes) and Economical Factors (3 codes) were extracted.

**Conclusions.** Paying attention to the identified factors on the maintenance of medical human resources in the form of the “Surge Capacity Programme” can increase the resilience of medical staff. Such measures pave the way for a better response to other threats similar to the COVID-19 pandemic.

**Key words:** hospital medical staff, hospital nursing staff, COVID-19.

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## Background

The outbreak of the new coronavirus known as COVID-19 in China in late 2019 and the subsequent rapid spread of it throughout different parts of the world caused great concern in various countries [1, 2]. The high transmission rate of the virus caused countries to face a large number of infected people [3, 4]. The Wuhan coronavirus 2019, known as COVID-19, is an infectious disease caused by a new member of the coronavirus family. The common symptoms are fever, cough and shortness of breath, whilst muscle aches, sputum and sore throat are less common symptoms [5, 6]. Although the majority of cases present with mild symptoms, some cases evolve into pneumonia and multiple organ failure. The mortality rate is estimated between 1 to 5 per cent but varies according to age and other health conditions. This disease spreads mainly through respiratory droplets from an infected person when he coughs or sneezes. The time between exposure to the virus and onset of symptoms can be within a range of 2 to 14 days. It can be prevented from spreading by washing hands, using masks and other hygiene tips [7].

Symptoms of COVID-19 usually begin a few days after the

person is exposed to the virus. But in some cases, symptoms may appear a little later. According to statistics and research, symptoms can include (in 8.3% of cases) [8]. The average incubation period is approximately 4 days. Turbidity is seen in 56.4% of cases in a chest scan. A chest X-Ray of 17.9% of patients with mild symptoms and 2.9% of patients with severe symptoms did not show any problems. Lymphopenia or a decrease in the number of circulating lymphocytes was observed in 83.2% of people at the time of admission [9–11].

The virus was first transmitted from animal to human (zoonotic). The Mercury virus was transmitted from camels to humans, and the SARS virus was hosted by cats, though the exact origin of COVID-19 is still unknown. Human-to-human transmission usually occurs when a person is exposed to the secretory fluids of an infected person (e.g. cough drops). Depending on the pathogenesis of the virus, exposure to the droplets of coughing and sneezing and touching contaminated surfaces can cause transmission [12].

As of 20 June 2020, the virus had spread to 213 countries around the world and was recognised by the World Health Organization (WHO) as a global epidemic (Pandemic). So far, the virus has infected nearly 214 million people worldwide and



killed 4,500 million people. In Iran, the virus has spread to all provinces, infecting 4,700,000 people, with more than 103,000 deaths [13, 14]. Absence from work during epidemics causes many problems for managers and employees, especially in the healthcare setting and hospitals [15]. Absence from work and shortage of staff in hospitals forces other personnel to carry the additional workload, which in turn can cause job dissatisfaction. Absenteeism also reduces the quality and quantity of hospital service during an epidemic [16–18].

In addition to the shortage of hospital staff as being a problem in most countries, especially in Iran, the high rate of absenteeism also has an effect on the minimal care available to patients and consequently reduces the level of overall community health. The shortage of any medical staff has adverse effects on the overall function of scientific management [19]. All these problems directly affect the patient care continuum. In addition, the provision of hospital services is a dynamic process that must constantly take into consideration planning for educational and healthcare services. Frequent absences among hospital staff stop these facilities from performing at their highest capacity, routine duties need more energy and resources, and patients do not receive proper care. As a result, there will be longitudinal trends in hospital length of stay and, consequently, not enough beds are available for those in need during the COVID-19 epidemic [20, 21]. It also causes enormous economical obstacles for families and society. In all health-related disasters, especially in epidemics, there is the potential for hospital staff to be absent from work for various reasons. This creates an atmosphere of insecurity among their teammates, who are on the front line during this crisis, in such a critical time for controlling the epidemic. The endurance of medical staff can improve the overall functionality of the health system during any crisis. Therefore, in this study, by identifying factors affecting the endurance of medical staff during the coronavirus pandemic, we have tried to provide a new model of increasing the resilience of the hospital medical staff in epidemics.

## Material and methods

The present study is a qualitative study conducted using a semi-structured face-to-face interview. The research team was referred to all educational hospitals in the Kerman Province which were identified as tertiary referral hospitals for admitting COVID-19 patients. We used purposeful sampling, and a full ex-

planation of confidentiality was given to the participants. We tried to conduct these interviews at the workplace of the interviewees in the tertiary referral hospitals of Kerman Province. All interviews were recorded, transcribed and analysed simultaneously.

Purposive sampling was used to take advantage of gaining the point of view of managers, physicians, nurses, paramedics and experts in the field of study. For better selection of the participants, we used the snow-ball technique. Participants in the study included physicians, nurses, clinicians and hospital administrators. The inclusion criteria were having any history of absence during the pandemic or any management experience during the COVID-19 pandemic. Interviews were conducted as needed until data saturation was reached. A total of 20 people, including 6 physicians, 2 hospital administrators, 7 nurses, 1 radiologist, 3 laboratory technicians and 1 clinical psychologist were interviewed at 7 educational hospitals in the Kerman Province.

For data analysis, we used MAXQDA software. The gathered data transcribed into the software and used the software for categorising data. A thematic method was used in data analysis. During the analysing process, some steps like familiarisation, identifying a thematic framework for indexing/coding, charting and, finally, mapping and interpretation were taken [22]. In this way, after transcription of the recorded interviews, considering the research aim, the researchers tried to summarise the results to obtain the general concepts and thematic themes. In the final mapping and interpretation step, the findings were described and interpreted. To increase the validity of results, draft reports were sent back to the interviewees to obtain their feedback on the research outputs.

## Ethical considerations

Written informed consent was obtained from all participants, and they were assured that their provided information will remain confidential. The present study was approved by the Ethical Committee of the Sirjan School of Medical Sciences (Ethics code: IR.SIRUMS.REC.1399.010).

## Results

After finishing the 20 interviews, we reached data saturation. After data analysis and coding, 127 initial codes were

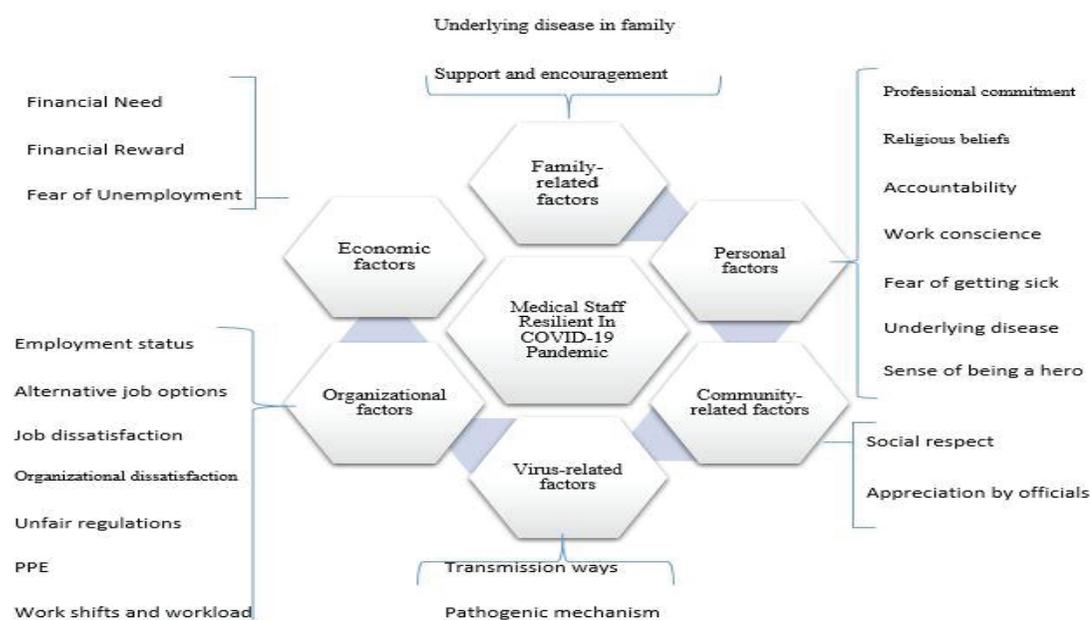


Figure 1. Factors affecting the resilience of medical staff during the COVID-19 pandemic

identified. By examining the codes, the research team merged 127 initial codes and extracted 23 codes in 6 main categories including personal factors, family-related factors, community-related factors, virus-related factors, organisational factors and economic factors. In Figure 1 below, you can see each of the categories and the related codes.

**Personal factors:** Level of professional commitment, level of religious beliefs, level of responsibility, having work conscience, fear of getting infected, having or not having underlying disease, sense of being a hero.

**Family related factors:** Having or not having underlying diseases in the family, level of support and encouragement of family and relatives.

**Community-related factors:** Respect in society, appreciation by officials and other organisations.

**Virus-related factors:** Awareness about ways of virus transmission, awareness of the pathogenic mechanism of the disease.

**Organisational factors:** Employment status, having or not having alternative job options, job dissatisfaction, organisational dissatisfaction, unfair regulation about work leave, limited and low-quality protective equipment, work shift and workload.

**Economic factors:** Financial need, financial reward, fear of unemployment.

### Personal factors

The identified codes in personal factors related to the endurance of medical staff during the COVID-19 epidemic include *level of professional commitment, level of religious beliefs, level of responsibility, having work conscience, fear of getting infected, having or not having underlying disease related to COVID-19 and the sense of being a hero.*

In this regard, one of the interviewees stated: “A person who believes in God and the Prophet in this situation will not leave his patients alone. Maybe he will stay longer because of God’s reward” (P 3). Another interviewee said: “In some other countries, because people do not believe in God, they may not come to work. But here they often feel responsible for God’s sake” (P17).

Many participants pointed to the underlying diseases and fear of getting infected. One of the physician participants said: “There were some co-workers who did not come to work due to pregnancy or heart problems, but there was a lot of empathy among the guys, and we all try to reduce the workload for someone who has an underlying disease and do not send them to high-risk cases” (P 9).

Another participant said: “I do not have any problem. I am healthy, and I am living well. I have no fear of the virus, so why should I not come to work” (P 4).

### Family related factors

Family-related factors such as *having or not having underlying diseases in the family and level of support and encouragement of family or relatives* were identified as factors affecting the endurance of medical staff during the COVID-19 pandemic. In this regard, the participants had different views. One of the participants stated: “Some families may not want to take a risk because they have elderly people. They do not let their children come to work, or if they come, they are forced to separate their homes. I myself live alone here, and my family is in another city. It is about two months since I have been home. But some people have a problem with this” (P 20).

Another interviewee said: “Because my parents are working in hospital, they never say that. They just say be careful and use protective equipment, but some families worried about their children” (P 17).

### Community-related factors

In this category, two codes, *respect in society and appreciation by superiors or the organisations*, were identified. Many of

the participants pointed to respect and appreciation by society. In this regard, one participant said: “Here we are in danger, but none of the authorities appreciate us, except some external organisations. People also have a lot of respect and encouragement” (P 12).

### Virus-related factors

In this category, two codes, *awareness of how the virus is transmitted and awareness of the pathogenic mechanism of the disease* were identified. Most participants emphasised the impact of these two factors on the endurance of the hospital staff during the COVID-19 pandemic. Relating to this, one participant said: “This new coronavirus is very strange. Experts still cannot fully explain the pathogenesis of the virus. This unpredictable virus engages a new organ every day. It would have been better if there was a known virus like the flu, then the staff would know how to protect themselves, but now, despite so much protection, many co-workers have become infected, and unfortunately, many of them have passed away” (P16).

Another interviewee stated: “Because it is a new virus, there are many rumours, and the staff is afraid of it. The more well-known the virus is, the more comfortable and relax the staff will be” (P 6).

### Organisational factors

The organisational factors encompass seven codes identified by participants as the most effective factors on the endurance of staff during the COVID-19 pandemic. These codes include *employment status, having or not having alternative job options, job dissatisfaction, organisational dissatisfaction, unfair regulation about work leave, inadequate and poor quality protective equipment, as well as work shift and workload.*

In this case, one participant stated: “In the early days, although we faced a shortage of personal protective equipment, none of us were absent. But in other hospitals, I saw some personnel were absent due to lack of equipment” (P 10).

Another person said: “With the arrival of COVID-19, the work shift has become very heavy, and there is high pressure on us. The hospital manager should hire more staff so that the staff would not be responsible for everything in this situation” (P 13).

### Economic factors

In this category, three sub-categories of *financial need, financial reward, and fear of unemployment* were related to the endurance of hospital staff during the COVID-19 pandemic. Most interviewees emphasised the role of economic factors in staff endurance.

In this regard, one of the physicians said: “I am not allowed to set up an office with a specialty in emergency medicine, and I have to pay a lot of taxes. If my salary is increased as a person who is at the forefront of the fight against the COVID-19, I would definitely be more motivated to work” (P 8).

### Discussion

In this study, 23 final codes were identified stating that personal factors and organisational factors were the most important factors affecting the resilience of hospital medical staff during the COVID-19 pandemic. Studies have shown that in a time of natural and man-made disasters, medical centres are faced with a shortage of personnel, and it is very important to increase the resilience of staff, especially those who are directly working in medical wards as they are at the forefront of responding to the pandemic [23, 24]. Personal factors such as underlying diseases, sense of responsibility, professional commitment and religious beliefs have a significant impact on the endurance and resilience of medical staff during the COVID-19 pandemic. An-

other study has also pointed to the impact of personal factors on the endurance of staff. Ives et al. showed a relationship between underlying diseases and fear during the Spanish flu pandemic [25, 26]. In any case, the performance of hospital staff is affected by the unknown nature of the virus and their problems. Underlying diseases such as diabetes, cardiovascular problems, lung problems and kidney problems that make a person more vulnerable to the virus and increase the probability of death make people who suffer from such problems more anxious at work and may have a significant impact on their endurance. In this case, it is essential to identify the staff with underlying problems and move them from high-risk units such as Emergency and Intensive Care Units (ICU) to low-risk units. In addition, the availability of protective equipment for people can give them peace of mind and reduce their anxiety [27].

Relating to organisational factors, the identified factors are mainly related to the attention of the hospital administrator to the work situation of employees. The provision of appropriate personal protective equipment is an initial right for the personnel. In Iran, with the start of the epidemic, the availability of protective equipment such as masks was affected by panic shopping. This led to a shortage of equipment in hospitals in the early days of the spread of COVID-19 [28]. Because in this situation, due to lowered admissions of elective patients, hospital income usually drops, and hospitals must prepare a surge capacity programme so that in addition to providing the required equipment, they can be ready for high workloads and reduce staff workloads through the provision of an increased human workforce and prevent the excessive fatigue of medical staff.

In many studies, employment status and job satisfaction have been identified as determining factors for one quitting [29, 30]. In Iran, medical personnel work for hospitals on a contract basis, and changes to a more stable contract can motivate them and increase their resilience. Economic factors which were more focused on payments during the pandemic period were emphasised by most participants, and financial rewards are some of the main incentives for medical personnel. Various studies have reported the impact of economic issues on the motivation and endurance of medical staff. In this regard, providing financial rewards along with appreciation and respect by the authorities can have the greatest impact on their endurance. Economic problems in Iran due to high inflation are some of the challenges faced by all members of society, especially government employees.

Family related-factors, community-related factors and virus-related factors also play a significant role in the resilience and endurance of medical staff during the COVID-19 pandemic. The new coronavirus has caused a wave of fear and anxiety among

people and medical staff due to its unknown and unpredictable nature. Although medical staff uses protective equipment, many of them are worried about becoming infected. The better-known the pathogenesis of the virus is, the lower the levels of anxiety among medical staff and the greater the resilience skills. Family situation and background factors can be another reason for absenteeism during the pandemic. Those having an elder or a child in their families or any member with a chronic disease like diabetes or heart or respiratory problems will be more cautious about a situation which may threaten their family.

## Limitations of the study

The limitations of this study were the possibility of transmission of COVID-19 between the researchers and medical staff. We tried to hold the meetings outdoors as much as possible and in accordance with health instructions.

## Conclusions

The resilience of medical staff is considered one of the important factors for disaster management in epidemics. During the COVID-19 pandemic, due to the sudden increase in the number of patients mostly seeking respiratory system-related services in hospitals, there was a shortage of human resources, especially in medical staff. In Iran, COVID-19 had a higher prevalence among medical staff than in other countries. The combination of these factors led to a lack of medical staff during the COVID-19 pandemic in hospitals. In this regard, it is necessary to consider those factors affecting the resilience of medical staff. These factors include personal factors such as underlying diseases and religious beliefs, organisational factors such as workload and the provision of personal protective equipment, economic factors, family and community factors, as well as virus-related factors. Paying attention to these factors can be done in the form of a surge capacity programme so that we do not face a shortage of human resources during a pandemic of infectious diseases.

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Address for correspondence:

Mohammad Heidari, PhD

Health in Disasters and Emergencies

Community-Oriented Nursing Midwifery Research Center

Shahrekord University of Medical Sciences

Ayatollah Kashani Blvd

Postal Code: 8815713471

Shahrekord

Iran

Tel.: +98 913185-0128

E-mail: [heidari@skums.ac.ir](mailto:heidari@skums.ac.ir)