



COVID-19

Explaining the challenges of the Iranian Health System in fighting the COVID-19 pandemic: A Qualitative Study

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Keywords

Health system • Challenges • COVID-19 • Coronavirus • Pandemic

Summary

Introduction. The COVID-19 pandemic has become a global threat for the general public and health care workers, and it has created major challenges for all healthcare sectors. The challenges created by this disease can vary in different countries depending on cultural, social, and economic factors. The purpose of this study was to explain the challenges of the Iranian health system in fighting the COVID-19 pandemic from the managers' and executive authorities' viewpoints.

Methods. The present study was a basic-applied research performed using a qualitative approach. It has studied 30 hospitals and medical centers' managers, deputies of the Ministry of Health, and the universities of medical sciences, which were selected by purposive and snowball sampling with the maximum variety in March-September 2020. Data collection was done through semi-structured interviews

and content analysis was used to explain the challenges of the Iranian health system in fighting the COVID-19 pandemic (2020).

Results. Most of the interviewees (34%) had a Ph.D. degree, and 40% of the participants were graduated in management and health economy and policymaking fields. Analysis and synthesis of the data collected from the interviews led to the creation of 19 sub-themes and 12 main themes classified into four general scopes: organizational factors, resources, management factors, and other factors.

Conclusion. Identifying the mentioned challenges can provide helpful information for the managers and policy-makers to develop appropriate plans, take the necessary measures to resolve the challenges, and use the available resources to provide the most effective services.

Introduction

Infectious diseases have constantly threatened human life and they can even ruin social stability. At the time of the spread of contagious diseases, especially when there is no specific prevention, people become scared. Therefore, infectious diseases are critical social problems that the government should control. Also, it is so essential for governments to suppress contagious diseases [1]. In fact, after an epidemic, delayed diagnosis and response will be a public challenge [2].

On December 31st, 2019, a group of patients with pneumonia were observed in Wuhan, Hubei, China. Further research revealed that this disease originated from the seafood market and is quite similar to viral pneumonia. This disease was different from severe acute respiratory syndrome coronavirus (SARS-COV) and Middle East respiratory syndrome coronavirus (MERS-COV); However, due to the structural similarities, the recent virus was considered as the first member of the coronavirus family that can transmit by humans [3-5]. China, was caused by a novel betacoronavirus, the 2019 novel coronavirus (2019-nCoV). On February 11th, 2020, the World Health Organization (WHO) named this virus COVID-19, the short form of coronavirus

disease 2019 [6]. This virus had a high dissemination speed, and on March 7th, 2020, after about two months of observing the first case, more than one hundred thousand people (101927) were infected by this virus in more than 90 countries [7]. On March 9th, 2020, the head of WHO mentioned the risk of the occurrence of this pandemic [8]. Finally, on March 11th, 2020, WHO declared this virus as a pandemic [9, 10]. So far, this virus has infected more than 139 million people and caused death to more than 3 million people worldwide. More than 2.1 million people have become infected by this virus in Iran, and more than 66 thousand people have died because of COVID-19 [11].

The high prevalence of this virus has caused fear, worry, health risks, and severe impacts on economic growth and social development [12]. In different societies, this virus has caused significant effects on the economic, banking, and insurance sectors, and the governments and financial markets [13]. The agriculture, petroleum, industry, and education sectors have also become affected by this pandemic, and it has caused the fear of economic crisis and recession. The emphasis on the observance of social distancing, quarantine, and traffic limitations has led to unemployment and serious damage to some jobs. Also, the demand for several goods has decreased and the need

for medical equipment has significantly increased [14]. COVID-19 pandemic has become a global threat for the general public and health care workers [15]; so that it has dramatically affected the provision of health services and telemedicine, the patients' expectations, the health care infrastructures, medical education, and research and publications in the scope of the of healthcare and medicine [16].

Meanwhile, the prevalence of this virus has led to significant challenges in the health economy, general health, and medical infrastructures [17]. The high costs of healthcare services, lack of personal protective equipment, lack of hospital beds and ventilators in intensive care unit (ICU) wards, and poor quality of patient care services are some of the challenges created by this disease [14]. On the other hand, this situation has created fear, concern, and anxiety for people [18].

The challenges created by this pandemic can vary in different countries depending on cultural, social, and economic factors. This study aims to explain the challenges of the Iranian health system in fighting the COVID-19 pandemic from the viewpoint of the managers and executive authorities working in the frontline of fighting with coronavirus, the managers and policy-makers of the Ministry of Health, and some of the Iranian medical sciences universities. Identifying these challenges can help the managers and policy-makers to make better decisions for fighting this pandemic.

Methods

This research was a basic-applied study performed using a qualitative approach [19] and content analysis [20, 21]. It aimed to explain the challenges of the Iranian health system in fighting COVID-19, 2020.

SELECTION OF THE PARTICIPANTS

The participants' opinions were collected by purposive and snowball sampling with the maximum variety in this study. The participants were selected from all the managers and deputies of the Ministry of Health, the universities of medical sciences, and hospitals and medical centers' managers of Tehran, Iran, Shiraz, and Yazd Universities of Medical Sciences. The inclusion criteria included the participants' willingness to attend the study, at least one year of experience in management or specialized education in management and health policymaking, and also involvement in COVID-19 control or treatment issues in recent year. Data collection continued until reaching data saturation [22]. Finally, 30 people were interviewed, including ten hospital and medical centers' managers and 20 managers and deputies of the Ministry of Health and the mentioned universities of medical sciences.

DATA COLLECTION

Data collection was done by an interview. First, an unstructured interview was done with three people in the frontline of pandemic management. They had comprehensive information about the challenges of

the Iranian health system in managing and fighting COVID-19 by one of the researchers. Then, the main questions were designed about workforces, equipment, place and facilities, process, and internal and external communications. Finally, an open question was included to remind the interviewees about the probably missed issues. In the next step, to evaluate the validity of the questions, two experts were interviewed as a pilot stage. These interviews were included in the final analysis because of the similarities with the main phase of interviews. Before performing the main interviews, the interviewees were informed and received some explanations about the research goals and the interview schedule, its time, and place.

Due to the dispersion of the interviewees in this study and the limitations caused by COVID-19, the interviews were performed by four researchers. At the time of the interviews, the researchers explained the research goals again and ensured the participants about using their recorded voices privately without using their names. Also, they asked to fill a consent letter for participation in the study. To prevent possible problems, the contents of the interviews were recorded in addition to taking some notes. The interviews were continued until reaching data saturation (30 interviews) and they were performed in March-September 2020 in the participants' workplace. The researchers tried to conduct the interviews in an informal space, without any bias, and avoid expressing their ideas about the answers. The interviews lasted an average of 23 minutes. To reduce intervening factors, the specialists were asked to turn their cellphones off and prevent the entrance of anyone into their workplace, at the time of the interview.

After conducting the interviews, the researchers immediately wrote the recorded contents on the same day. In addition to the written contents, the interviewees' specialty and position, time and place of the interview, and other necessary information were also included in the documents. The interviews and the filled forms were assigned a specific code to facilitate the later reviews. Also, the participants were asked if they were willing to answer any further questions in the following. After writing the interview texts, the interviewees were called again and added the necessary information to the forms when there was any ambiguity.

DATA ANALYSIS

After conducting the interviews and writing recorded contents, the collected data was analyzed and synthesized. Data analysis was done through qualitative content analysis. Many studies have used this method for subjective content interpretation of text data by systematic stratifying, coding, theme development, and designing common patterns processes [20, 21]. This analysis mainly aims to provide a precise and comprehensive description of the phenomenon and it results in the extraction of the concepts and categories that explain the phenomenon [23]. Before data analysis, one of the researchers reviewed all the recorded interviews to check their accuracy. Then, two researchers read the written texts of the interviews several

times to become familiar with the content of the data. After getting an insight into the collected data, they coded them by parallel coding. In this method, the researchers simultaneously code the written data by reading them. Based on the principles of parallel coding, it is probable that each of the meaningful coding units can be assigned to two different categories with different labels. So, at the end of coding, the researchers reviewed the items and assigned them to the more relevant codes to extract higher levels of subjective concepts such as the themes and sub-themes by inductive and implicit approaches. In the inductive method, since the researcher aimed to extract the underlying concepts of the data and higher levels of subjectivity, after reviewing the texts several times and parallel coding, the researchers defined the code labels. Then, the relevant codes were integrated and sub-themes were formed gradually. In the next step, the themes were generated by reviewing the concepts and their content relationship. Finally, to classify the explained themes, they were classified into four general scopes: organizational, resources, management, and other factors.

TRUSTWORTHINESS AND RIGOR OF THE STUDY

Lincoln and Guba’s (1994) index was used to ensure the trustworthiness and rigor of the collected data. This index includes credibility, transferability, dependability, and conformability [24]. The researchers used different methods such as taking notes, recording the interviews, long-term involvement, data immersion, co-researchers’ revision, and the participants’ revision to evaluate the data validity.

Regarding the transferability of the data, since the interviewees are the people who are directly involved in fighting this pandemic, the results of the research can be generalized to other studies performed in Iran or other similar regions. Also, the participants’ demographic information is presented in Table I.

Considering the credibility of the data, the researchers

have tried to clarify all the research stages, including the selection of participants, performing the interviews, and data analysis. Also, they attempted to include the participants’ statements in their findings exactly. Meanwhile, all the recorded interviews, the written contents, data coding, and analysis were supervised by two co-researchers.

Regarding the conformability of the data, two experts out of the research team were asked to evaluate the research procedure and coding process.

Furthermore, all the interviews and the extracted codes were analyzed by two researchers. To approve the similar findings and decide about disagreements, they were compared again. Finally, all the members of the research team studied the themes and sub-themes in a meeting. It should be mentioned that the final synthesis was done by two research team members who did not have any conflict of interest and were qualified in this area. So, the issues related to the conflict of interests and reflexivity were observed.

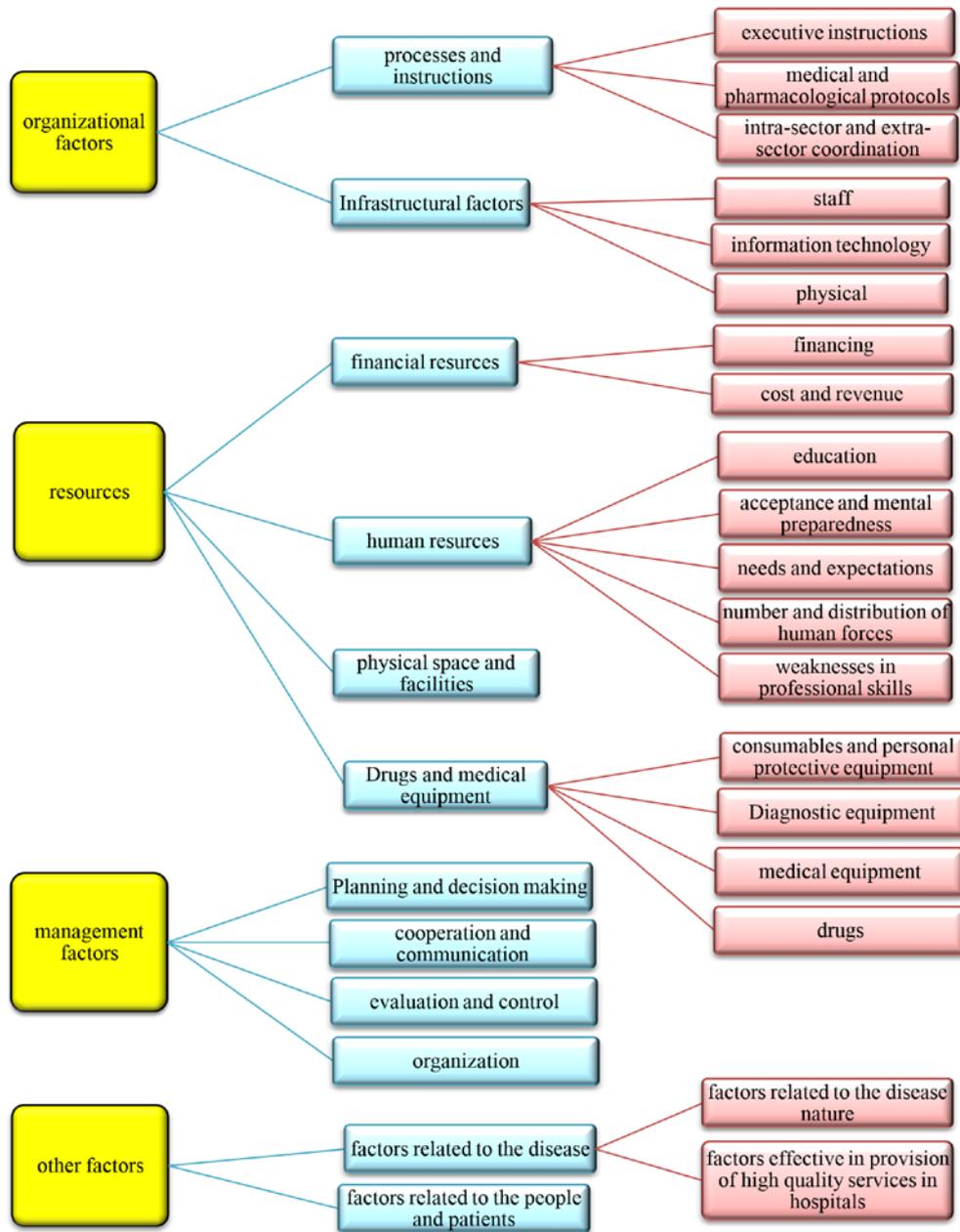
Results

In this study, 30 people were interviewed, including ten middle managers (the executive managers of hospitals and medical centers) and 20 top managers and policy-makers of the Ministry of Health and the Iranian universities of medical sciences. Most of the participants were male (87%) and had Ph.D. (34%) and MSc degrees (27%). Meanwhile, 40% of the participants were graduated in management and health economy and policymaking fields. The participants’ average age was 48, and their average working experience was 20 years (Tab. I). Analysis of the data collected from the interviews and the extracted codes led to defining 19 sub-themes and 12 main themes classified into four general scopes: organizational factors, resources,

Tab. I. Characteristic of the study’s interviewees.

Variables		Frequency (percent)	Mean ± SD
Experts’ field of activity	Middle-level managers (Hospitals’ executive)	10 (33)	-
	High-level managers & policy-makers	20 (67)	-
Gender	Male	26 (87)	-
	Female	4 (13)	-
Education degree	MD	3 (10)	-
	MSc	8 (27)	-
	MD, MPH	4 (13)	-
	Medical specialist	4 (13)	-
	MD, PhD	1 (3)	-
	PhD	10 (34)	-
Last field of education	General physician	7 (23)	-
	Special physician	4 (13)	-
	Management, health policy and health economic	12 (40)	-
	Others	7 (23)	-
Age		-	48 ± 7
Work experience (year)		-	20 ± 6
Duration of interviews (minutes)		-	23 ± 10

Fig. 1. The thematic framework of the challenges in front of Iran’s health system in dealing with the COVID-19 pandemic.



management factors, and other factors. Figure 1 presents the thematic framework of the challenges of the Iranian health system in fighting the COVID-19 pandemic based on the four mentioned scopes. Also, Table II to V presents all the main themes, sub-themes, and their qualitative codes about the challenges of the Iranian health system confronting the COVID-19 pandemic.

CHALLENGES RELATED TO THE ORGANIZATIONAL FACTORS

Challenges related to organizational factors consist of two major themes: “the processes and instructions” and “infrastructural factors”.

The processes and instructions

This theme includes three sub-themes, i.e., “executive instructions”, “medical and pharmacological protocols”, and “intra-sector and extra-sector coordination”. The factors related to executive instructions mentioned by the participants included the dispersion and lack of clarity or practicality of some of the Ministry of Health and WHO regulations and the repetitive changes in the protocols, especially in the early stages of the pandemic. One of the participants stated: “The regulations determined by Ministry of Health and WHO, even about some of the protective equipment, were unknown and the main items of personal protection were not specified. Our tasks were also unclear” (P25). Another participant stated:

Tab. II. The challenges of the Iranian health system in fighting COVID-19; organizational factors.

Themes	Line-managers	Staff-managers	Sub-themes and related codes	
Processes and instructions	✓	✓	Executive instructions	Dispersion, lack of transparency, and executive capacity of some of the laws and instructions proposed by the Ministry of Health and the World Organization
	✓	✓		Repetitive changes in the protocols especially in the early stage of the pandemic
		✓		Delay in sending instructions by the Ministry of Health
	✓	✓		Choosing a hospital as the referral hospital
	✓	✓	Medical and pharmacological protocols	Lack of treatment method or standard drug for the disease
	✓	✓		Repetitive changes in the treatment and medication protocols
	✓	✓	Intra-sector and extra-sector coordination	Lack of intra-sector and extra-sector coordination in the early stages of the pandemic
		✓		The time-consuming process of attracting new human forces
		✓		Lack of coordination and agreement among the different deputies of the university about human force attraction
Infrastructural factors		✓	Staff	Lack of experience in hospitals to fight with such prevalent respiratory diseases
		✓		The change in the human force structure in the area of treatment of (non-communicable diseases) compared to hygiene in the recent years
	✓	✓		Lack of specialist forces in some regions especially in the area of infectious diseases, ICU, pulmonary, and internal diseases
	✓	✓	Information technology	Lack of virtual education infrastructures
	✓	✓		Lack of a comprehensive centralized system for registering the positive cases of coronavirus and failure to analyze the data on time for proper decision making
		✓		Lack of electronic health records and previous records and information of the patients' underlying diseases
		✓	Physical	Lack of proper diagnostic infrastructures in the country
	✓	✓		Lack of the necessary infrastructure to prepare a large amount of the consumer and protective equipment
	✓			Lack of readiness of drug distribution network of Food and Drug Administration
	✓			Lack of protective equipment producing companies in the country

“Even supposing their accuracy, the instructions were frequently changing and the hospitals could not change their whole structure again to adjust that with the new protocols” (P8). The other challenge mentioned by some of the participants was choosing a hospital as the referral hospital. “Choosing the center of this disease was one of the challenges. After selecting our hospital as the coronavirus reference center, some disputes were raised about the reason for choosing an educational hospital as the corona disease reference center” (P25). In the sub-theme of intra-sector and extra-sector coordination, one of the issues mentioned by most of the middle and staff managers was the lack of intra-sector and extra-sector coordination in the early stages of the pandemic. This situation had led to the organizations’ confusion about how to perform their tasks. “The university did not exclusively charge management. In most cases, we need to negotiate with the province attorney and the police. Although there was good cooperation in our province, it was impossible in many provinces and the order of upstream authorities was necessary” (P19). “Contradiction is the worst agent exacerbating

the situation. The organizations were not coordinated at all and there was a weak agreement” (P8). Also, another interviewee (P21) explained: “The academic departments of the hospital did not cooperate in changing the application of the wards and canceling the operations to allocate the operating room to coronavirus patients and preventing the spread of the disease”.

Infrastructural factors

These factors include three sub-themes of the staff, information technologies, and physical infrastructural elements. In the area of staff infrastructures, one of the challenges some interviewees mentioned was the lack of specialists in some regions, especially in the area of ICU, infectious, pulmonary, and internal diseases. “We did not educate the human forces to use the surplus forces in crises. So, in the case of a crisis, there will be more need for human forces depending on the specialties. In this pandemic, we faced the lack of specialists in infectious, pulmonary, and internal diseases fields” (P14). In the sub-theme of information technologies, most middle and staff managers mentioned the lack of virtual

education infrastructures. “We faced several problems in the area of educational infrastructures to provide the experimental and clinical education to the students. So, they had to attend the hospital wards to receive the necessary educations” (P25). Some participants mentioned the lack of a comprehensive centralized system for registering the positive cases of coronavirus and the failure to gather or analyze the on-time data for the proper decision-making process. “There should be a system for registering the positive cases of coronavirus so that the registered people could refer to the health system would be available to service providers under criteria of WHO and the Ministry of Health, Treatment, and Education” (P16). In the sub-theme of physical structures, most of the participants mentioned the lack of necessary infrastructures to prepare protective equipment. “One of our challenges was the need for products such as mask and glove in the society and the impossibility of supplying the whole demands at the time of the occurrence of this pandemic” (P17).

CHALLENGES RELATED TO RESOURCES

These challenges refer to the lack of resources needed to fight this pandemic. They include four major themes: financial resources, human resources, drug and medical equipment, and physical spaces and facilities.

Financial resources

This theme includes two sub-themes of “financing” and “cost and revenue”. Considering financing factors, the challenges mentioned by most of the interviewees were included insufficient staff payment benefits and support them. One of the interviewees stated that “the hospital’s income had decreased during the pandemic and consequently the payment to the staff also decreased. Therefore, the Ministry of Health provided support to the personnel employed in the wards that involved with COVID-19 patients, but this support was not enough” (P25). In this regard, (P20) stated that: “One of the issues that was so important is that the corona had two important effects on the economy of hospitals, one was that the revenue of hospitals was sharply reduced and the other was that costs per patient increased due to the special needed medicine or equipment”.

Human resources

This theme includes the five sub-themes of education, acceptance and mental preparedness, needs and expectations, number and distribution of human resources, and weaknesses in professional skills. Considering education, the challenges mentioned by most of the participants included the inefficiency of the education provided for the personnel to cope with the crises and emergencies, lack of updated and efficient education about infectious and respiratory diseases, and how to care for the patients. “Passive defense and crisis training have been provided for the personnel. However, this crisis showed the inefficiency of these educations” (P23). Also, another interviewee said that “Some of the death cases might be due to

the inadequate educations provided for the personnel working in special care wards” (P25). In the sub-theme of acceptance and mental preparedness, some of the participants believed that one of the main challenges was the personnel’s (the nurses and specialists) fear of getting infected by this virus and transmitting it to their family as one of the participants explained: “Some of the employees resigned not to be exposed to the risk of being infected by this virus” (P16). In the sub-theme of the needs and expectations, some of the middle managers mentioned the personnel’s expectation for supplying personal protective equipment as one of the challenges. “The employees’ expectation of receiving personal protective equipment was a challenge for the managers” (P25). In the sub-theme of the number and distribution of human resources, most participants, especially the staff managers, mentioned the lack of a trained and specialist workforce as the most critical challenge. “We had to exclude some of the employees who had an underlying disease and were not able to work in this pandemic” (P21). “Supplying specialized, skilled, and trained staff was also a challenge” (P7). “We faced the lack of experienced and skilled employees in the ICU ward” (P26). In the sub-theme of weaknesses in professional skills, a few numbers of the staff managers mentioned the challenges in the relationship between the personnel and patients, such as: “In the early stages, we did not know how to talk to the patients and what to do for them and what not to do” (P24).

Drugs and medical equipment

The four sub-themes included in this theme include consumables and personal protective equipment, Diagnostic equipment, medical equipment, and drugs. One of the main challenges in this sub-theme was the lack of personal protective equipment such as ordinary masks, N95 masks, gloves, clothes, shields, glasses, head cover, shoe cover, etc. It was mentioned by most of the interviewees. Since the middle and staff managers were responsible for supplying these items, most of them mentioned that as a key challenge. “In the early stages of this pandemic, we faced challenges to supply protective equipment such as mask, special clothing for protection (that was found to be unnecessary later), shield, glasses, head and shoe cover, and other protective equipment” (P25). In the sub-theme of diagnostic equipment, one of the challenges mentioned by some of the interviewees was inaccuracy of diagnostic tests. In this regard, one of the interviewees stated that “the results of some PCR tests performed in the early days of the pandemic were incorrect, which affected the functioning of the health system” (P14). In the sub-theme of medical equipment, most of the participants mentioned the lack of medical equipment (CT scan, oxygen generator, respiratory aids, laser thermometer, and pulse oximeter) and updated laboratory and diagnostic facilities as the other challenges. “In some of the hospitals, we had only one CT scan device. So, we faced challenges in using that

for both corona and other patients. Meanwhile, some of the oxygen generators in the hospitals were not working properly and there was a lack of ventilator in ICU wards” (P53). The other challenge mentioned by some of the staff managers was the lack of useful and effective drugs for the disease in the early stages of the pandemic. “The drugs suggested for the disease were not common drugs; i.e. they were not commonly used and so, they were not produced routinely. For example, one of them was malaria drug that is rare in Iran” (P13).

Physical spaces and facilities

Some of the participants mentioned the observance of infection control protocols in allocating physical spaces to coronavirus wards as one of the challenges of the Iranian health system. This challenge was related to both the hospitals covered by the Health Ministry and the medical sciences universities and the temporary treatment centers established by other institutions. “One of the necessary standards for fighting this disease in hospitals is to separate the corona-patients

Tab. III. The challenges of the Iranian health system in fighting COVID-19; resources.

Themes	Line-managers	Staff-managers	Sub-themes and related codes	
Financial resources		✓	Financing	Lack of financial support for research and hygiene
	✓	✓		Lack of necessary budget and credit
		✓		Lack of transparency in funding some of the actions taken and the problem of paying for them
		✓		Consequences of quarantine such as economic problems
	✓		Income and cost	Inadequacy payment benefits and support for medical staff
	✓	✓		Decreased revenue of hospitals and the consequent problems
	✓	✓		Increase costs per case
Human resources	✓	✓	Education	The problems in the area of education (training) or continuing it during the pandemic
		✓		The professors' unpreparedness for virtual education
	✓	✓		Inefficiency of the education provided for the personnel to fight the critical and emergency conditions
	✓	✓		Lack of up-to-dated and inadequate education about infectious and respiratory diseases and how to care for the patients
		✓	Acceptance and mental preparation	Lack of proper insight to the disease
	✓	✓		The personnel's (the nurses and specialists) fear and anxiety of being infected by this virus and transferring that to their family
	✓	✓		Lack of acceptance and willingness to face the disease in the personnel
	✓	✓		Inadequate mental preparedness in the personnel and the consequent mental problems
	✓	✓		Fatigue and burnout of medical staff / manpower
	✓		Needs and expectations	The personnel's expectation for supplying personal protective equipment
	✓			Providing proper welfare and nutrition facilities for the corona ward personnel
	✓		Number and distribution of human forces	The absence of some of the employees from their workplace
	✓	✓		Increased work load and numerous responsibilities of the personnel
	✓	✓		The employees' personal problems such as pregnancy, having underlying diseases, and high risk conditions
	✓	✓		Lack of manpower
		✓		Lack of specialist and trained manpower
		✓		Inappropriate distribution of manpower and employing them in inappropriate positions
	✓	✓		Infection or death of health workers
		✓		Weaknesses in professional skills
		✓	Negligence and not taking seriously in infection control by some of the specialists	
	✓	Challenges in the relationship between the personnel and patients		





Drugs and medical equipment	✓	✓	Consumables and personal protective equipment	Lack of personal protective equipment such as the ordinary masks, n95 masks, gloves, clothes, shield, glasses, head cover, shoe cover, etc.
	✓	✓		Low quality of some of the personal protective equipment
	✓	✓		Lack of disinfectants
	✓	✓		The need to supply a lot of personal protective equipment and disinfectant in the early stages of the pandemic
	✓	✓		High price and hoarding of the personal protective and consumables equipment
	✓	✓	Diagnostic equipment	Lack of kit and diagnostic equipment
		✓		High price of coronavirus diagnosis kits
	✓	✓		Low accuracy of the diagnosis kits
	✓			Time-consuming process of diagnosis
	✓	✓	Medical equipment	Lack of medical equipment (ct scan, oxygen generator, respiratory aids, laser thermometer, and pulse oximeter) and updated laboratory and diagnostic facilities
		✓		Shortage of hospital beds, especially icu beds
	✓	✓		Depreciated facilities and equipment
		✓		Lack of biobank
		✓		Impossibility of supplying medical equipment from foreign countries
	✓	Drugs	Shortage of useful and effective drug for the disease in the early stages of the pandemic	
	✓		High price of drugs	
Physical space and facilities	✓	✓	Shortage of physical space in hospitals for reception of respiratory patients such as coronavirus cases	
	✓		Observance of infection control protocols in allocation of physical space to coronavirus wards	
	✓		Inobservance of standards in temporary treatment centers and their low popularity	
		✓	Shortage of laboratory space	
	✓		Lack of infectious (biological) ward, negative pressure ventilation system, and standard isolation room in some of the hospitals	
	✓		Lack of specialized biological (infectious) hospital in the country	
		✓	Inappropriate ventilation in some units	
	✓	Density of personnel in some units		

emergency, triage, and hospitalization wards from the wards allocated to other patients. However, except for some specialized respiratory hospitals, others did not have the capacity of these measures” (P14). “Regarding physical space and the establishment of convalescent homes, our country showed that it has good capacities for fast and shocking actions. Still, the main problem was compliance with the standard. Here, this question is raised: Was it a right decision to establish temporary facilities and change the application of sports fields and parking spaces to the convalescent homes for hospitalization of corona-patients, in terms of the observance of standards?” (P16).

THE CHALLENGES RELATED TO MANAGEMENT FACTORS

The main themes of this area are classified into four general categories: planning and decision-making, cooperation and communication, evaluation and control, and organizing.

Planning and decision-making

One of the challenges mentioned by most of the staff managers was the lack of proper plan and preparation

in the early stages of the occurrence of this pandemic so that no measure could be taken for the situation. “The Ministry of Health, despite being informed about the disease in the world from a month before it occurred, had no specific and codified plan to deal with this crisis”, (P7) interviewee said.

Cooperation and communication

Parallel actions of some of the institutions were other challenges some staff managers mentioned. “Unfortunately, there are many organizations in Iran that take similar measures without any coordination. These parallel decisions, parallel costs, and parallel human resources create serious problems for the health system” (P2).

Evaluation and control

One of the challenges mentioned by some of the interviewees was the lack of any reference to approve the validity of different information and instructions. “In the early stages of the pandemic, instructions were developed by different sectors and circulated to hospitals and other medical centers for implementation. There was no referral institution to evaluate the validity of

Tab. IV. The challenges of the Iranian health system in fighting COVID-19; management factors.

Themes	Line-managers	Staff-managers	Sub-themes and related codes
Planning and decision making	✓	✓	The authorities' negligence in the before and early stages of the pandemic
	✓	✓	Failure to recognize and diagnose the disease and how to deal with it in the early stages of the pandemic
	✓	✓	Lack of planning and preparation before and in the early phases
	✓	✓	Surprise, the health system's confusion on how to deal with the disease
		✓	No need assessment and proper estimate before the measures and decisions
		✓	Poor crisis management and lack of plan before, during, and after the early crisis
	✓		Passive, reactive, and nonsystematic actions
		✓	Poor evidence-based policy making
Cooperation and communication		✓	Lack of on-time information and education for the general public
		✓	Poor performance of passive defense
	✓		Stopping the activity of medical equipment supplying companies in quarantine
		✓	Parallel actions in some of the organizations
		✓	Lack of coordination and organization of the facilities provided by charities
		✓	Delayed formation of the national headquarters of COVID-19 administration
		✓	Poor management of the media and virtual space
Evaluation and control	✓	✓	The large mass dispersed and invalid information and inadequacy of the reliable statistics and information
	✓		Lack of a reference for checking and approving the instructions
		✓	Lack of attention to the experiences of successful countries in fighting coronavirus and failing to use different post-crisis policy models
		✓	Irrational use of the drugs such as antibiotics
	✓		Lack of supervision of prices in the early phases of the pandemic
		✓	Lack of international control on the borders and openness of the country's entrances
Organization	✓	✓	More focus on treatment than prevention and less attention to care systems
	✓	✓	The unclear role of the temporary treatment centers and lack of proper management in them
	✓		Involvement of most of the hospitals in the diseases in some periods
	✓	✓	Lack of a trustee, management and command system in the beginning of the pandemic
		✓	Poor management of the available resources and waste of the resources
	✓	✓	Failing to use all the available capacities and institutions
	✓	✓	Improper allocation of financial supports among the personnel (inequity)

the instruction and circulate them. Different versions of instruction were contradictory and it was tried to execute them quickly” (P16).

Organizing

Another challenge some participants mentioned was the lack of trustee and a specific and clear management structure at the beginning of the pandemic that led to the confusion of the involved organization. “We did not have any proper and systematic structure in Ministry of Health, universities, province attorneys offices, and another institution in charge of coronavirus management. The previous structured proposed for crisis management were not efficient in this situation” (P6).

Other factors

Two categories of themes, including “the factors related to the people and patients” and “the factors related to

the disease” were included in this area, besides the other mentioned challenges.

The factors related to the people and patients

One of the main challenges mentioned in this area is the people’s fear of the disease. For example, one interviewee stated, “Most of the patients were somewhat frightened when they became informed of their disease and became quite frustrated after being transferred to the ICU” (P24).

The factors related to the disease

This theme includes the two sub-themes of “the factors related to the disease nature” and “the factors that are effective in the provision of high-quality services in hospitals”. In the first sub-theme, most participants mentioned the new and unknown nature of the disease and its symptoms and complications. The interviewee

Tab. V. The challenges of the Iranian health system in fighting COVID-19; other factors.

Themes	Line-managers	Staff-managers	Sub-themes and related codes	
Factors related to the people and patients	✓	✓	Delayed treatment of patients with other diseases and the consequent complications due to not going to the hospital in pandemic condition	
	✓	✓	The people's fear of the disease	
	✓	✓	Inobservance of health protocols by some of the people and patients	
		✓	The people's tiredness of observing the protocols and the decreased social resilience	
Factors related to the disease	✓	✓	Factors related to the disease nature	New and unknown nature of the disease and its symptoms and complications
	✓	✓		The changed behavior of the virus and impossibility of predicting the disease
		✓		The high transmission rate of the disease
		✓		The long incubation period
		✓		Person-to-person transmission of the disease
	✓	✓	Factors that are effective in provision of high quality services in hospitals	Impossibility of providing face-to-face clinical education for the people and patients
	✓	✓		The coronavirus patients' referring to hospitals simultaneous with other diseases
	✓	✓		The large population of patients
	✓			The people's expectations from health workers for service provision
	✓			The impacts to other routine services
	✓	✓		Decreased quality of service provision
	✓			The increased workload in laundry and the volume of hospital waste
		✓		The limited time for preparing the personnel for reception of the patients

(P15) stated in this field, “The involved countries such as China did not provide adequate information about this disease, and the unknown nature of the disease and its complications was a major challenge because it created serious problems in decision making and planning” (P15). The decreased quality of service provision was another factor mentioned in the sub-theme of the factors effective in providing high-quality services in hospitals. For example, one of the interviewees stated that “The decreased quality of service provision due to the use of non-specialist forces in the new infectious wards was a significant challenge. For example, when we changed the surgical ward into an infectious ward, the surgical personnel had to work in an infectious ward, so they did not have enough skills and specialty. Someone who has been away from the infectious ward for years and only does dressing and injections is definitely not of the same quality as someone who has been in the infectious department” (P23).

Discussion

The spread of COVID-19 has created many challenges for all the health sectors [25]. The challenges created by this disease can vary in different countries depending on cultural, social, and economic factors. According to the findings of the present research, the challenges of the Iranian health system to deal with COVID-19 include 19 sub-themes and 12 themes classified in four general

areas of organizational factors, resources, management factors, and other factors.

One of the challenges in the area of organizational factors mentioned by most of the participants was the lack of intra-sector and extra-sector coordination in the early stages of the pandemic. Tello-Leal has reported that to provide better services and achieve the system goals, and there should be more concentration on the inter-organizational processes and coordination [26]. Inter-sector coordination prevents surplus actions and increases efficiency. So, it can avoid the waste of resources and lead to proper use [27]. In the study of service provision challenges in the COVID-19 crisis, Ashrafi Rizi states that the nature of the crisis is the rapid creation of tension in societies. However, it seems that the authorities involved in crises have not adopted proper information policies and plans in this crisis. So, they have not predicted any coherent program and strategy for information management in the current crisis. Sometimes, procrastinating to provide the general public with the statistics leads to the increased concerns in the society and the creation of quasi-information and miss-information [28]. In the spread of coronavirus, there should be some plans to use the capacities for the realization of proper responsiveness. Extra-sector coordination among the province authorities, NGOs, charities, and public and private organizations and intra-sector coordination among the health system, Ministry of Health, universities, and hospitals to share the experiences and opinions could

lead to a better performance of the health system to deal with the virus. The organization is necessary for developing a proper management system to fight this virus. The Incident command system (ICS) has been circulated in different organizations since several years ago, and it has been operated in hospitals for various crises such as an earthquake. This structure should become activated for fighting the coronavirus spread, too. In the hospitals involved in this pandemic, this system should become activated and the employees' responsibilities should be circulated in the framework of the incident command system. Also, it is necessary to develop this system and circulate the employees' tasks in the hospitals that have not been involved in this pandemic yet. There should be continuous contact with the EOC of the universities for more coordination and the incident command system should monitoring the critical situation (the incidence and outbreak of the disease) in hospitals in order to take proper measures. Workforce protection is one of the fundamental challenges mentioned by most of the participants. Caring for infected patients is a risk for the employees, particularly in special care wards. Caring for the infected patients increases the probability of infection of the health workers due to their continuous exposure to patients with severe conditions. Also, the experience of severe infection and death among the health workers in the spread of the previous epidemics such as SARS and MERS and also the current pandemic has created fear and stress in the employees. Health workers have described their concerns about their own and their families' health in the previous epidemics and their experience of fear, anxiety, social prejudice and stigma [29]. In the acute phase of the epidemics, stressor factors such as social distancing, the fear of COVID-19 infection, loss of the family members and friends, and reorganization of the family, academic, and professional life are prioritized [30]. When we feel a threat and we are not able to encounter that, it is common to feel concern, anxiety, and fear. In the current conditions, coronavirus is the worrying phenomenon and it requires care and attention. In this special situation, the fear and anxiety created by the unknown nature of the disease and its rapid transmission have a great affected not only the patients but also the planners, policy makers, health worker and all people in general. The fear of being infected by this disease can disturb the health workers' performance. Health workers should have a high quality of work life to be able to provide favorable services for patients. Job stress in any group especially in health workers can negatively affect in the individuals' health status and it also leads to organizational consequences such as decreased productivity.

According to the findings, supplying protective equipment was a serious challenge for the people and health workers in the early stages of the pandemic. The consumption of medical equipment needed to control infection such as medical masks, N95 masks, hand disinfectants, etc. significantly increases in pandemic situations [31]. So, it is important to ensure

the availability of a supply chain of the necessary items. To be informed of infection control strategies and acquire updated information and knowledge, the doctors of special care wards should contact healthcare authorities [29]. Regarding the reported challenge, the critical issue is to pay attention to "drug and equipment supply chain management" to adopt proper strategies for using the external capacity and supplying the necessary items. Also, it is necessary to provide a favorable situation for treatment centers and hospitals to supply the necessary equipment to provide efficient services.

According to the findings, one of the mentioned challenges was the lack of a comprehensive and centralized system for registration of the positive cases of coronavirus and on-time data analysis for proper decision making. Providing the necessary infrastructures for information registration and continuous reporting of performance and pandemic (COVID-19) information is a useful tool for realization of optimal performance among the health system and hospitals managers and authorities such as planning, organizational, resource allocation, coordination, decision making, and monitoring based on the available information and documents. Najafi et al. performed a study to investigate the experiences of hospital managers in coping with this virus in Iran. They reported that appropriate documentation and data collection increases the organization's ability to plan and survive in this crisis. An organization's ability to effectively perform its tasks depends on its decisions and the quality of decisions is a function of the quality of the information used as a basis of decision making [32].

Conclusions

The COVID-19 virus has created a global pandemic; Since COVID-19 has spread beyond the borders and is not considered a regional epidemic anymore (as stated by WHO), it can be mentioned as an almost novel crisis. This study explains the challenges of the Iranian health system in fighting the coronavirus pandemic from the viewpoint of the managers of different levels of the health system. Identifying the mentioned challenges can provide useful information for the managers and policy makers to develop appropriate plans, take the necessary measures to resolve the challenges, and use the available resources to provide the most effective services.

Also, health system policy-makers should be aware of the ethical principles observed in this area. On the other hand, the people should understand the health system's challenges and follow the suggestions emphasized by the health system.

STRENGTHS AND LIMITATIONS

In this study, a qualitative interview with the managers and executive authorities working in the frontline of fighting coronavirus and also the senior policy-makers of the Ministry of Health and medical universities was

used to explain the challenges of the Iranian health system. This method provides an in-depth investigation of the unknown opinions and challenges that are almost novel. One of the research limitations was the absence of evaluation and weighting of the extracted challenges that require further studies.

Ethical approval

Ethics approval for this study was obtained from the Shahid Sadoughi University of medical sciences (the ethical code of the research project is IR.SSU.SPH.REC.1399.062). All methods were carried out under relevant guidelines and regulations.

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Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

MK RZ and T Sh designed this study, developed the study methods, collected and analyzed the study data, and wrote the first draft of the manuscript. S M M, F E. M R, and R A also collected the data. All authors read and approved the final version of the manuscript.

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