

## Iranian Health System Response to the COVID-19 Pandemic

### Abstract

**Introduction:** The COVID-19 pandemic has created several challenges for countries all over the world. Different countries have taken different measures to fight this pandemic and reduce its challenges depending on their cultural, economic, and social structures. This study aims to understand and explain the Iranian health system's response to fighting the COVID-19 pandemic from the managers' and authorities' perspective. **Method:** This study is a basic applied research performed under a qualitative approach. In the survey, 30 experts including the managers of health centers and deputies and heads of the Ministry of Health and Medical Education and Medical Universities were selected by purposive snowball sampling and participated in semi-structured interviews from March to May 2020. The researchers explained the actions of the Iranian health system in fighting the COVID-19 pandemic in 2020 by content analysis. **Results:** As a result, 14 subthemes were found and classified into four major themes, including the informative and regulative actions (two subthemes), administrative and supportive actions (six subthemes), preventive and curative actions (three subthemes), and resource-related actions (three subthemes). **Conclusions:** Due to its strong health structures, such as urban and rural health networks, various general and specialized hospitals, experienced doctors, and committed health staff, Iran has taken practical actions in fighting the COVID-19 pandemic. However, the findings of this study and its relevant measures can help combat this pandemic in countries with similar social and cultural structures or counter future similar crises.

**Keywords:** Actions, COVID-19, health system, pandemic, response

### Introduction

The new coronavirus disease 2019 (COVID-19) first reported in China spread quickly to different countries worldwide. So because of its vast prevalence in many countries, it was introduced as a pandemic by the World Health Organization on March 11, 2020.<sup>[1-3]</sup> COVID-19 has become one of the leading global challenges threatening people's health and the world's economy in 2020–2021.<sup>[4]</sup> The widespread COVID-19 in different societies has caused many impacts on the economy, insurance, governments, the general public, and financial markets.<sup>[5]</sup> Various industries like petroleum and many sectors including education and service provision have been affected by this pandemic, and there has been a fear of crises and economic recession.<sup>[6]</sup> Although this pandemic has caused much socioeconomic damage, being in such situations can improve the health system's performance<sup>[7]</sup> because many experiences and lessons

can be achieved and learned. The lack of cooperation between the mentioned sectors, the lack of medical equipment and diagnostic laboratory facilities,<sup>[8]</sup> and the healthcare personnel's burnout have seriously affected the health systems.<sup>[9]</sup> Regarding the global challenges caused by the COVID-19 pandemic, different policies and measures have been taken to fight this pandemic.<sup>[4]</sup> This disease can be prevented by observing social distancing, wearing masks, washing hands, and avoiding closed places.<sup>[10]</sup> Also, it has been emphasized that quarantine is necessary for people with and suspected of COVID-19.<sup>[11]</sup> So, the emphasis on social distancing, quarantine, and traffic restraints has led to the unemployment of manpower and damage to many businesses. Meanwhile, the demand for several goods has decreased while the need for medical equipment has significantly increased.<sup>[6]</sup> The regions exposed to the virus can become prevalence zones unless proper health interventions are done in public places and individuals. In this regard, it is necessary to plan and execute

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appropriate systematic interventions to prevent the spread of the virus worldwide.<sup>[12]</sup>

On the other hand, human crises such as COVID-19 have provided significant opportunities in healthcare sectors that can be used for revision in health service provision systems.<sup>[13]</sup> In this regard, different countries have adopted different strategies to respond to this pandemic.<sup>[14]</sup> One of the actions of the Chinese government to fight this pandemic is the construction of a 1000-bed hospital during one year, the suspension of flights and other public vehicles, and closing the cinemas and schools.<sup>[15]</sup> In Italy, thousands of ventilators, masks, and laboratory kits were purchased to fight the COVID-19 pandemic. Meanwhile, to solve the problem of the lack of human resources, new manpower was hired. The other actions taken in this country were decentralization, making the health system budget flexible, and developing the public and private sector collaborations in response to the emergent condition.<sup>[16]</sup> So far, COVID-19 has affected more than 512 million people and caused the death of about 6.2 million people worldwide. More than 7,221,000 people have been affected by this disease in Iran, and more than 141,000 have died from it.<sup>[17]</sup> Like most countries, in Iran, different measures have been taken to fight this pandemic. These measures include quarantine, imposing traffic constraints, closing schools, producing the necessary equipment inside the country, and educating the health personnel.<sup>[18]</sup>

This study aims to explain the actions of the Iranian health system in fighting the coronavirus pandemic from the viewpoint of executive managers and authorities in the frontline of fighting this virus and the senior managers and policy-makers of the Ministry of Health and several medical universities. The results of this study can be used in fighting this pandemic and future similar crises and similar conditions in countries with similar structures.

## Materials and Method

This research is a basic applied study performed by qualitative approach and content analysis to explain the response of the Iranian health system in fighting the COVID-19 pandemic in 2020.

### Selecting participants

The research population included the managers and deputies of the Iranian Ministry of Health and Medicine, hospital managers and staff managers, and deputies of medical universities of Tehran, Shiraz, Iran, and Yazd. The participants were selected out of the mentioned sample frame by purposive sampling with the maximum variety. Meanwhile, snowball sampling was used to access more informed people and obtain further data. The inclusion criteria included the individuals' willingness to participate in the study, at least a one-year management experience, and direct involvement in COVID-19-related issues. The exclusion criteria included lack of access to the subjects

after calling and referring to them three times and their unwillingness to participate in the study. Data collection continued until data saturation,<sup>[19]</sup> and finally, 30 managers and authorities were interviewed. Out of this population, 10 people were the managers of hospitals and treatment centers, and 20 were the managers and deputies of the Health Ministry and the universities of medical sciences.

### Data collection

In the present study, data collection was done by semi-structured qualitative interviews. Regarding the interview guide, at the beginning we searched the related literature to arrive at specified scopes. Then, we shared these scopes with experts to get their opinion about that. Finally, the scopes as the main questions of the interview were included: issues related to human resources, the used materials and equipment, place and facilities, and intra-ward and extra-ward activities. Before the interviews, the subjects were informed and explained the research goals, and finally, the interview schedule was developed. Due to the dispersion of participants in this study and the limitations imposed by coronavirus conditions, the interviews were done by four authors. Before starting the interviews, the research goals were explained again, and the participants declared consent to participation in the study and record their voices. Also, they were ensured about the privacy of their information. During the interviews, the participants' claims were recorded by the researchers. The interviews continued until reaching data saturation (after 30 interviews). Finally, an open-ended question was raised to remind the participants of the probable issues. Meanwhile, the participants were asked for their consent regarding any potential questions to be answered in the future.

The interviews were done in March–May 2020 in the subjects' workplace. The researchers tried to perform the interviews in an informal space without any prejudice or bias and avoided expressing their opinions about true or false answers. The average duration of the interviews was 23 minutes. The interviews were made written immediately after being finished.

### Data analysis

After doing the interviews, the obtained data were analyzed. Data analysis was done by qualitative content analysis. This method is usually used for mental-content interpretation of text data by systematic classification processes, coding, and theme creation, as used in many studies.<sup>[20,21]</sup> This type of analysis mainly aims to provide an accurate description of the phenomenon, and it results in the creation of themes or categories that can explain that phenomenon.<sup>[22]</sup> Two researchers read the interview texts to become familiar with the data and become immersed in that for analyzing the interviews. After getting acquainted with the collected data, the data were coded by parallel coding. In this method, the researchers manually code the

data while reading them. Based on the principles of parallel coding, assigning each of the meaningful coded units to two different classes with different labels is possible. So, at the end of coding, the researchers commonly review the codes and classes to categorize them into similar groups. Then, processing the primary codes led to the creation of higher levels of abstract concepts such as themes and subthemes.

The themes and subthemes were generated by inductive and implicit content analysis. Accordingly, since the researcher aimed to achieve the latent concepts of the data and higher levels of abstraction, the codes were labeled after parallel coding, and the related codes were integrated to form the subthemes. In the next step, reviewing the subthemes and their content relationship led to the generation of themes.

### Trustworthiness and rigor of the study

Guba and Lincoln (1994) proposed four criteria of credibility, transferability, dependability, and conformability to ensure the trustworthiness and rigor of the qualitative data.<sup>[23]</sup> So, to ensure credibility, the researchers used different methods such as note-taking and recording the interviews, long-term immersion in the data, and revision of the data by co-researchers and the participants.

Since the participants of this study were senior health managers and authorities of four medical universities and the Health Ministry, and they were directly involved in the management of this pandemic, the results can be generalized to the whole country and the countries with similar cultural, social, economic, and healthcare structure. In this regard, Table 1 presents the participants' demographic information.

To ensure dependability, the researchers have tried to fully explain all the stages of selecting the participants, doing the interviews and data analysis, and quoting the participants' claims exactly. Also, all the recorded interviews were coded and analyzed data, and all the processes were monitored by two researchers. To ensure conformability, two experts other than the researchers were asked to check and evaluate the research procedure and data analysis accuracy.

Furthermore, the interview texts and the extracted codes were independently analyzed by two researchers; codes were again compared to approve the similar findings and decide disagreements. Finally, all the members of the research team processed the themes and subthemes in a meeting. All the analyses were done by two research team members who did not have a conflict of interest about the research subject and had adequate awareness due to their background, knowledge, and skills. So, conflict of interests and reflexivity were also observed.

### Ethics approval and consent to participate

Ethics approval for this study was obtained (ethical code: IR.SSU.SPH.REC.1399.062). Also, consent to participate

**Table 1: 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

in the study was also obtained through written informed consent forms from the participants. All methods were carried out following relevant guidelines and regulations, too.

### Results

In the study, we interviewed 30 people, including the managers and authorities of the Iranian Ministry of Health. Forty percent of the participants were graduates of management, policymaking, and health economy. The participants' average age was 48 years, and their mean working background was 20 years [Table 1]. Data analysis led to the creation of 14 subthemes classified into four major themes. Figure 1 presents the thematic framework of the actions of the Iranian health system in fighting the COVID-19 pandemic based on the four major themes. All the themes and subthemes are presented in Tables 2–5, and they are described in the following.

### Informative and regulative actions

This theme includes the two subthemes of informing and training and formulating instruction and modifying processes. In informing and training subtheme, one of the actions mentioned by more than half of the participants was the education of human forces under the supervision of the relevant specialists and experienced staff. They claimed that “the presence of infection control supervisor and educational supervisor and face-to-face education

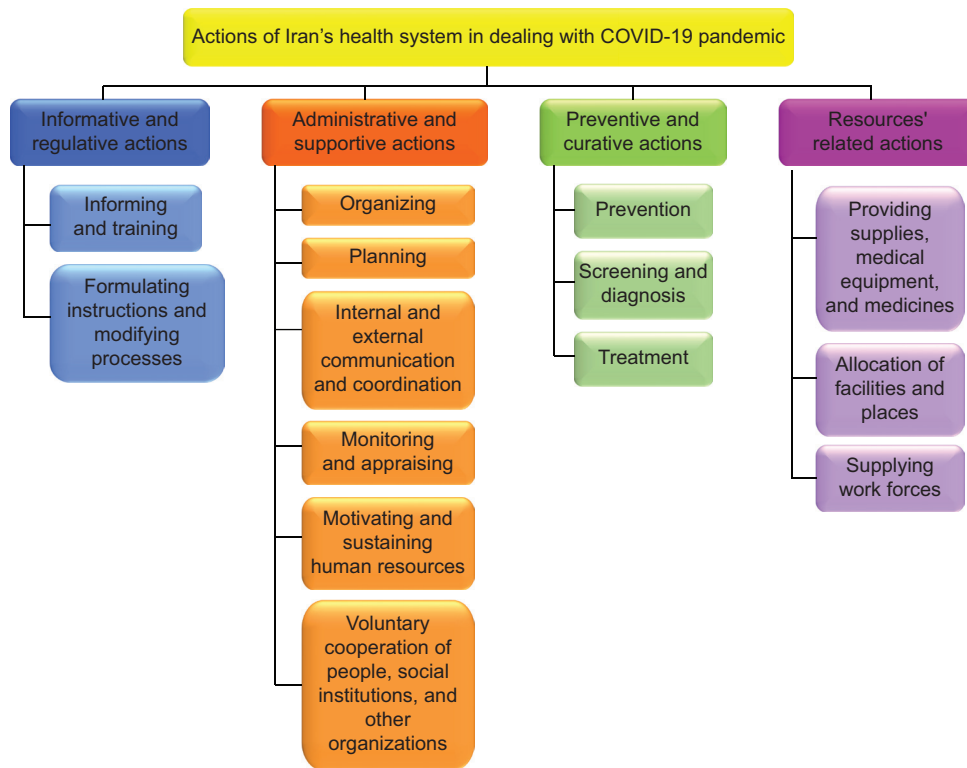


Figure 1: Thematic framework of Iran's health system actions in dealing with COVID-19 pandemic

**Table 2: Informative and regulative actions of Iran's health system in dealing with the COVID-19 pandemic**

Theme	Subthemes	Related codes
Informative and regulative actions	Informing and training	Human resource education under the supervision of specialists
		Providing educational pamphlets for patients
		Using the virtual space for personnel education
		Providing self-education packs for healthcare providers
		Education of the public and volunteer human force
	Formulating instructions and modifying processes	Creating counseling centers for informing people by telephone, SMS, and virtual networks
		Reporting the performed actions and providing promising information besides the death reports
		Providing instructions on using the protective equipment
		Elimination of the bureaucratic process of getting permission for the production of medical equipment
		Providing virtual education
		Modifying the processes
		Providing the protocols for fighting the disease and the necessary equipment
		Communication between national, provincial, and academic headquarters for decision making

of the human forces was so useful for teaching how to wear clothes and mask, outing the equipment, and gray and red lines instruction” (P21). Another interviewee claimed that “upon the declaration of COVID-19 spread in the world, we started our primary education courses and even face-to-face training. So, we held educational workshops on COVID-19 and respiratory diseases by the infection control committee a month before the prevalence of the disease in the country. All the internal and infectious diseases specialists and infection control supervisors, matrons, and hospital heads were invited to different meetings in these courses. They received the necessary education” (P19). The other

action mentioned by some of the staff managers was the use of virtual space for personnel education so that one of the participants claimed that “training webinars were held three times a week on Saturdays, Mondays, and Wednesdays. First, need assessment was done for holding training courses” (P10). In formulating instruction and modifying the process, some of the participants’ actions were eliminating the bureaucracy of getting production permission and purchasing medical equipment. In this regard, one of the participants claimed that “the government had facilitated the regulations of producing medical equipment and getting the necessary permissions” (P21).



**Table 3: Administrative and supportive actions of Iran's health system in dealing with the COVID-19 pandemic**

Theme	Subthemes	Related codes
Administrative and supportive actions	Organizing	Integration of the measures, decisions, and actions in organizations of the provinces under the supervision of medical universities
		Keeping some hospitals clean for other patients
		Formation of national coronavirus headquarters and circulation of the instructions
		Formation of technical committees monitored by the national committee
		Formation of provincial headquarters for regular meetings in provinces
		Formation of academic headquarters and weekly meetings in universities
		Formation of technical committees under the supervision of academic headquarters
	Planning	Holding crisis management sessions in hospitals with the presence of authorities
		The presence of the president and national authorities at the coronavirus headquarters
		Conducting various studies by board members of the universities
		Planning daily activities for fighting COVID-19
		daily situation analysis
	Internal and external communication and coordination	The active presence of medical universities
		Intra-ward and extra-ward coordination
		Cooperation between private and public universities
		Determining the corona respondent in every hospital
		Determining specific units for fighting coronavirus
		Communication of provincial crisis management committees and national headquarters and the state passive defense headquarters
	Monitoring and appraising	Using MCMC <sup>1</sup> capacities for fair distribution of drugs
		Controlling the produced personal equipment
Intra-provincial production management and prevention of the existence of the materials		
Promoting the quality of personal protective equipment		
Execution of the enactments of the academic headquarters		
Mutual inspection with other organizations in high-risk zones		
Multilayer supervision for making sure the access to instructions		
Recording the coronavirus statistics		
Imposing traffic limitations		
Motivating and sustaining human resources		Assessment of human force needs
	Mental support of personnel	
	Using the national media to encourage the personnel	
	The presence of managers and authorities for sympathy with the personnel	
	Motivational supp or financial aids	
	Appreciating the health system in coronavirus sessions	
Voluntary cooperation of people, social institutions, and other organizations	The country's leadership support of the health system	
	Supplying the necessary equipment with the cooperation of knowledge-based and industrial companies	
	Participation of public groups and NGOs in providing supportive services for personnel	
	Using the capacity of military systems	
	The presence of military forces for creating health center	
	Participation of municipalities in public information and disinfection	
Participation of hotels in supplying accommodation and food for personnel		
		Construction of field hospitals

<sup>1</sup>Medical Care Monitoring Center

### Administrative and supportive actions

This theme included the six subthemes of organizing, planning, internal and external communication and coordination, monitoring and appraising, motivating and sustaining human resources, and voluntary cooperation of people, social institutions, and other organizations.

In organizing subtheme, almost half of the interviewees mentioned one of the actions was forming provincial corona

headquarters and regular meetings in Province Government Departments. In this regard, one of the participants claimed that “the provincial corona headquarters was formed by the university chancellor, the provincial authorities, and other officials of the involved institutions. In the case of any problem, approval of the upstream authorities was necessary. The decisions were made in the provincial government departments and followed by passive defense groups to set the executive orders to be applied to the whole

**Table 4: Preventive and curative actions of Iran’s health system in dealing with the COVID-19 pandemic**

Theme	Subthemes	Related codes
Preventive and curative actions	Prevention	Execution of closing protocols and social distancing
		Cooperation of different businesses in social distancing protocols
		Transferring the Iranian students from Wuhan and their quarantine
		Continuous disinfection of hospitals
		Using disposable dishes
		Prohibiting the presence of patients’ companions
		Rejection of elective patients and surgeries
		Allocation of diagnosis kits for patients referring to hospitals
		Using highly reliable diagnosis tests
		Using trained forces in diagnosis centers
	Screening and diagnosis	Establishing an internet system for screening the patients
		Early detection of patients
		Creating diagnosis systems in the province by integrating laboratories
		Establishing 16-hour health centers
		Dividing the cities into different regions and focusing on the prevalence of flow
Treatment	Increasing the daily number of diagnosis test	
	Trying not to miss any positive case	
	Providing free services in the early stages of the pandemic	
	The active presence of infection and anesthesia specialists	
	Cooperation of academic groups	

province” (P25). In the planning subtheme, one of the actions mentioned by some of the participants was daily situation analysis. In this regard, one of the participants claimed that “the daily number of clients was evaluated in terms of the hospitalized patients and outpatient cases. The patient’s condition was assessed by patient safety, infection control, nursing management, and hospital management units” (P14).

One of the main actions mentioned in the subtheme of internal and external communication and coordination was intra-ward and extra-ward coordination that could match different organizations. In this regard, one of the participants claimed that “We held several mutual and multiple meetings to get information from different organizations and circulate the instructions” (P18). In the monitoring and appraising the subtheme, some of the participants’ actions were intra-provincial production management, centralized distribution, and prevention of carrying the raw materials out of the province. One of the participants claimed that “the universities contract with raw material producing companies and distribute the equipment in a centralized manner” (P21). In this subtheme, some interviewees claimed that “multilayer managerial supervision for ensuring access to instructions and their execution had been one of the main actions performed in the Iranian health system.” In this regard, P19 claimed that “We had four to five managerial and supervision layers in the cities to ensure the execution of instructions besides receiving them.”

One of the actions mentioned in the subtheme of motivating and sustaining human resources was the mental support of the human forces to reduce their fear

and anxiety with a psychologist or psychiatrist and the managers’ and officials’ supportive actions to minimize the personnel’s stress. Reduction of fear and anxiety is one of the critical issues that should be attended by managers. In this regard, one of the interviewees claimed that “Different psychologist and psychiatrist groups significantly helped the personnel” (P25). Meanwhile, P20 contended that “our mental and managerial supports were so effective in reducing anxiety and concern in human forces.”

In the subtheme of voluntary cooperation of people, social institutions, and other organizations, one of the actions mentioned by all the participants was supplying the necessary facilities, protective equipment, and medical equipment with the cooperation of public voluntary groups, and knowledge-based and industrial companies. In this regard, one of the participants claimed that “knowledge-based companies significantly helped us in this area. We invited a group of students and knowledge-based companies.” They helped industrial companies, and they accelerated the production of the necessary materials. We could supply five-layer and seven-layer masks (the same as N95 masks) with the cooperation of knowledge-based companies (P25). Another interviewee claimed that “in the first peak of the disease, public aids and the supports of charities were so valuable in all areas such as supplying personal protective equipment, nutritional supports, and expensive medical equipment” (P14).

**Preventive and curative actions**

This theme included the three subthemes of prevention, screening, and diagnosis, and treatment. In the prevention

**Table 5: Resources related actions of Iran's health system in dealing with the COVID-19 pandemic**

Theme	Subthemes	Related codes
Resources related actions	Providing supplies, medical equipment, and medicines	Supplying medical equipment by the relevant ministries
		Production of alcohol and disinfectant solutions by knowledge-based companies
		Using the capacity of medical universities for production and packing
		Supplying personal protective equipment in hospitals
		Cutting the dependence on the capital city for supplying the equipment and materials
		Requiring hospitals to store the materials at least for 3 or 4 months
		Supplying the budget for purchasing medical equipment
		Prioritizing the purchase of medical equipment
		Communicating with the companies producing diagnosis kits
		Renewing the stock equipment and their management in faculties
		Predicting different scenarios for supplying medical equipment
		Purchasing oxygen generator devices
		Using the authorities of provinces to supply the facilities deficit
		Production of PCR kits by knowledge-based companies
		Prioritizing treatment centers in the distribution of the facilities
	Employing indigenous experts for the production of diagnosis kits	
	Using foreign aids in supplying medical equipment	
	Allocation of facilities and places	Allocation of particular parts for coronavirus patients and separating them
		Establishment of new infectious wards
		Using the stock of unique ward beds or purchasing them
Using all the wards of referral hospitals		
Allocating large general hospitals as referral hospitals		
Supplying workforces	Creation of temporary caring centers	
	Creating accommodation facilities in hospitals for the personnel	
	Supplying human force from other wards	
	Supplying human force from other hospitals	
	Using trained personnel in the coronavirus ward	
	Recruitment of new and temporary human forces and extension of the contracts of intern forces	
	Increasing the number of environmental health workers	
	Outsourcing	
	Getting permission for the recruitment of nurses and other health forces from the health ministry	

subtheme, some of the staff managers' actions were the circulation and execution of preventive protocols, imposing constraints, and observing social distancing in offices and social places. In this regard, one of the participants claimed that "remote working was executed over several stages" (P18). Another interviewee contended that in a remote working program, social places, educational environments, hotels, and motels were closed in two phases for 15 days (P27). In the screening and diagnosis subtheme, one of the actions mentioned by some of the interviewees was establishing the 4030 online system for screening and follow-up, and detection of the affected people. In this, one of the participants claimed that "We screened about 77 million people by 4030 over a short period." Health experts called people by 4030 lines and asked about their situation and their families' condition (P4). The other action mentioned by a few staff managers was early clustering and detection of patients for cutting the transmission change. One of the interviewees claimed that the Health Deputy of the university formed an emergent group. This group was responsible for

detecting the positive cases of coronavirus and making them stay at home. At the same time, they would receive training tips at home (P19). The other action mentioned in this subtheme was establishing 16-hour health centers to provide the general public with the necessary instructions and following the suspected cases (P8). It was claimed that "the Ministry of Health established 16-hour health centers to reduce the workload imposed on hospital staff and receive outpatient cases."

One of the actions mentioned in the treatment theme was the cooperation and participation of specialized and academic groups in the treatment or prediction of the treatment procedure. One of the participants claimed that "the traditional medicine and modern medicine groups such as infectious and pulmonary diseases groups were linked and helped the hospital. Nutrition and counseling groups also helped the patients and personnel" (P25).

### Resource-related actions

This theme included the four subthemes of providing supplies, medical equipment, and medicines, allocating

facilities and physical environment, allocating facilities and places, and supplying workforces.

One of the actions mentioned in providing supplies, medical equipment, and medicine was using indigenous specialists to produce diagnosis kits in provinces. One of the participants claimed that we established a diagnosis system with a high capacity because we had a particular unit for respiratory diseases established in 2009. The capacity of the equipment and kits available in this center was enough, but the model needed to be changed. We modified the diagnosis model with the aid of the specialists who cooperated with us, and we could produce diagnosis kits even in our country (P19).

The action mentioned in allocating facilities and physical environment was assigning an independent part of the hospital for coronavirus patients or separating their facilities from the other patients. In this regard, P14 and P20 claimed that we chose and equipped some special wards of the hospital, such as the isolated ward that had a higher capacity to provide coronavirus patients' service. Meanwhile, the other action mentioned by most of the managers was the establishment of new (infectious and special) wards for coronavirus patients in hospitals. This action was noted in the allocation of facilities and places. P25 claimed that we established eight infectious wards, five ICU wards, two emergency wards, and two pediatric wards regarding a large number of patients.

In supplying the workforces, one of the frequently mentioned actions was recruiting new and temporary human forces and extending the contracts of intern forces. One of the managers claimed that the volunteers passing the final stages of recruitment were hired with short-term (89-day) contracts, and they entered into the healthcare system (P25).

## Discussion

Regarding the infrastructures and the underlying structure of their country's health system and population structure, governments have adopted different strategies for fighting COVID-19.<sup>[14]</sup> Based on the present study's findings, the actions taken by the Iranian health system were classified into four major themes and 14 subthemes.

One of the actions mentioned by some managers was forming national coronavirus headquarters which was first conducted by the Ministry of Health, Treatment, and Medical Education and then conducted by the president. In this committee, some of the ministers were present for the promotion of inter-ward cooperation. Meanwhile, provincial COVID-19 committees were established under the supervision of the local government authorities. In China, a centralized leadership group was formed for fighting COVID-19, and provincial coronavirus control was assigned to the provincial government authorities.<sup>[24]</sup> In Italy, the government appointed the civil protection

director (CPD) responsible for the necessary interventions. CPD established a scientific-technical committee for doing the actions required for protecting people.<sup>[25]</sup> In Germany, the state and federal health teams formed a crisis team to promote cooperation between federal states.<sup>[26]</sup> In South Korea, a coronavirus headquarters was created in the cities and provinces. In late February, the central government declared that local governments play a significant role in responding to the crisis. It asked the authorities for more participation in managing this crisis.<sup>[27]</sup>

In the present study, one of the actions mentioned by the managers was the education of the people and personnel by training pamphlets, the virtual space, and collective media. In China, video conferences provided educational programs to make the personnel familiar with the late information about the disease. Meanwhile, they assigned specialists to educate the personnel and used the medial to promote public awareness.<sup>[24]</sup> In South Korea, the government used a 24-hour hotline and website for the people's attention. The other action performed in this country was the management of virtual space and channels. In this country, data collection was done at the proper time to reduce people's fear.<sup>[28]</sup> South Korea has also used collective media for providing accurate information to people.<sup>[29]</sup> In Singapore, a combination of traditional methods and social networks was used for public education. These educations included how to wear a mask, wash hands, and stay home. The government also used websites for providing information.<sup>[30]</sup>

The other action mentioned by the managers was supplying the necessary budget for purchasing medical equipment, equipping hospitals with beds, providing free services for coronavirus patients, and reducing the tax imposed on manufacturing companies. WHO has declared health system financing as one of the priorities of the governments. WHO financing policies have focused on promoting health system resilience, public health coverage, and promotion of the citizens' health in different countries.<sup>[31]</sup> In this regard, China allocated a budget to purchase medical equipment, construct new hospitals, and buy hospital beds to provide better services for patients.<sup>[24]</sup> The Italic government also allocated a budget of more than 5000000 euros for primary interventions.<sup>[25]</sup>

According to the findings, executing the protocols of closing educational environments and public spaces for 15 days during the new year holidays, social distancing, and imposing constraints in social places were other actions mentioned by managers. Several preventive measures were taken in Spain, such as closing educational environments, extending 15-day limitations, restricting trips, and home quarantine except in emergency cases such as buying drugs and food, and closing unnecessary businesses.<sup>[32]</sup> In Thailand, night traffic was prohibited for preventing



the transmission of the virus.<sup>[33]</sup> In France, several sectors were closed for the prevention of viral spread.<sup>[34]</sup> Similar constraints were also imposed in China, Italy, and America.<sup>[35]</sup>

The other action performed in Iran was establishing an internet system (4030) to screen the people, follow up on the suspected cases, and establish [salamat.gov.ir](http://salamat.gov.ir). In Italy, telemedicine was replaced for patients referring to health centers.<sup>[36]</sup> In America, a system was developed for 24-hour monitoring and following emergency cases, and screening people by Email to prevent unnecessary traffic.<sup>[37,38]</sup>

## Conclusions

Due to its strong health structures such as urban and rural health networks, various general and specialized hospitals, experienced doctors, and committed health staff, it seems that Iran has taken effective actions in fighting the COVID-19 pandemic. However, the current economic and international conditions have created a problematic situation for the country's administration and elimination of this disease. This goal requires the cooperation of all countries and the support of organizations such as WHO, UNICEF, etc., for permanent control of this virus. The findings of this study and the relevant measures can help fight this pandemic in countries with similar social and cultural structures or countering future similar crises.

## Strengths

A qualitative approach was adopted to explain the measures of the Iranian health system. This method provides a more in-depth insight into the subject than other methods, such as using a questionnaire. The participants, the managers, and executive authorities of the health ministry and medical universities constituted the research population, and they could provide us with reliable data.

## Limitations

Based on the principles of qualitative studies, such studies' reliability largely depends on the participants' willingness to participate in the research and the researchers' avoidance of bias. So, it was tried to select informed and enthusiastic participants and employ a multiple research team and avoid the previously adopted viewpoints to provide a realistic analysis of the incident and the actions of the Iranian health system.

## Ethics approval and consent to participate

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). Consent to participate in the study was also obtained through written informed consent forms from the participants. All methods were carried out following relevant guidelines and regulations.

## Consent for publication

The participants consented to the publication of data collected from them by endorsing informed consent forms. A statement was indicated in the informed consent form, which made it clear that by supporting the document, they were agreeing that the information being collected could also be published.

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## Conflicts of interest

There are no conflicts of interest.

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