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REVIEW ARTICLE

Challenge of Managing Hospitals during the COVID-19 Pandemic: A Qualitative Study

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A B S T R A C T

Background: The COVID-19 pandemic has posed many challenges on the health system and hospitals to provide services. This study investigated the difference between factors affecting hospital management which considered in preparing a disaster management plan for hospital in the face of a pandemic based on the experiences of hospital managers.

Methods*:* This qualitative research was conducted on selected hospitals affiliated in Alborz University of Medical Sciences in 2021. Data were gathered with purposive sampling and semi-structured interviews with 16 hospital managers. MAXQDA 10 and framework analysis were used to analyze the data.

Results*:* The results were categorized in four categories: 1) Mitigation including staffing, bed capacity, enough space for quarantines, protective equipment, diagnosis and treatment equipment, funding, medicines, patient follow-up, management and leadership; 2) Preparedness such as crisis committee, preparedness and response plan, measures, action plan; 3) Response including motivating health workers, cooperation and coordination; 4) Recovery and lessons learned including providing facilities, expediting patient processes, control, economic conditions, and planning better, passive defense, regular crisis committee meetings, human resources, documentation and use of information systems in planning.

Conclusion: In addition to providing the necessary infrastructure, it is important to plan for fair distribution of resources and effective supply chain management. A mechanism should also be developed at the national level to anticipate future health crises and to prevent and control diseases in the most effective way.

Keywords: Preparedness, Managing Hospital, Coronavirus Disease 2019 (COVID-19), Pandemic

Introduction

Coronavirus disease 2019 (COVID-19) is a crisis that has caused a major global economic downturn and has affected every aspect of human life ((1)). COVID-19 is a respiratory disease caused by the SARS-CoV-2 virus with person-to-person transmission (2, 3). According to the World Health Organization (WHO), COVID-19 originated in Wuhan (a city in China) in December 2019 and quickly spread throughout the world. On January 30, 2020, the WHO declared COVID-19 a "Public Health Emergency of International Concern" that requires a coordinated global response. This new virus and its economic and social impacts continue to pose a critical threat to the world (4, 5).

The pandemic has had a significant impact on health system, the world economy, lowering global growth and negatively impacting investor

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confidence and financial markets (6, 7). Over the past few years, the number of infections and deaths due to COVID-19 has increased globally in several waves, with the highest mortality rate among older people (8, 9). Emergency committees have stated that the spread of COVID-19 may be interrupted by early detection, isolation, prompt treatment, and a robust system to trace contacts (10). Most of studies in this area are relevant to controlling the current global emergency, further research is needed to provide reliable methods to manage these types of public health crises in the short and long term (10-13). Indeed, all countries, including Iran, have tried to have a better pandemic management to control it (14). Proper management of the COVID-19 crisis is highly complex, yet crucial and will certainly affect the consequences of the pandemic (15, 16).

The COVID-19 pandemic is taking a toll on governments and health systems worldwide. Studies have shown that inadequate measures taken by the government and the community for managing the spread of COVID-19, shortage of medical equipment, and environmental health are some of the biggest challenges in decision-making and intervention against this pandemic (14). Hospitals are at the front line against the disease. In addition to treating patients with COVID-19, hospitals should also follow up patients after discharge, provide medical records, and transfer information and statistics to high-level committees and agencies (17). They also need to take steps to protect their staff, which requires a great deal of work and financial resources. Health systems and hospital management face different challenges. Therefore, this study investigated the challenges and factors affecting hospital management during the pandemic based on the experiences of hospital managers.

Materials and Methods

Study design and participants

This qualitative study was conducted in 2021 in the hospitals affiliated with Alborz University of Medical Sciences. The research was conducted in three hospitals that were the hospitalization center for corona patients in Alborz province. Hospital management teams were the target population. A qualitative research was used with purposive sampling, and semi-structured interviews were conducted with 16 Chief Executive Officer (CEOs) or hospital managers, nursing manager, and supervisors in educational and medical centers to identify their current situation and experiences in managing hospitals during COVID-19. The interviewees were selected from the team of managers of the studied hospitals as well as professors' familiar with the subject who were willing to participate in the research. The interviews continued until data saturation was reached. The interviews were conducted in person at the workplace of the interviewees with prior coordination and appointment based on a semi-structured questionnaire.

Data collection and analysis

After reviewing the relevant texts and consulting experts, the authors developed an interview guide to conduct the interviews. Informed consent was obtained from the interviewees to participate in the research. They took notes during interviews and recorded them with the participants' permission. To reduce judgment error, two authors independently analyzed the qualitative findings. Additionally, disagreements were resolved by a third author, and the key concepts and issues were identified and coded. Next, the data were extracted from original texts and were categorized. Finally, based on the questions, the main themes and subthemes were extracted from the interviews. Braun and Clarke’s six-step framework for thematic analysis was used to analyze the data. These steps included 1) becoming familiar with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining themes, and 6) writing up (18). The purpose of thematic analysis is to identify important or interesting patterns or themes in data (19).

MAXQDA 10 software was used for data management and analysis to identify the main ac-

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tions, experiences, challenges, and strategies of hospital managers. To keep the identity of the interviewees confidential, their names were replaced by codes.

The main themes and subthemes extracted from the interviews are presented in Table 2. It must be noted that due to the special circumstances caused by the pandemic and the busy schedule of hospital managers, it was very difficult to conduct extensive and detailed interviews. However, the critical nature of the issue prompted the researchers to make every effort to continue interviews until saturation was reached. In addition, due to the importance of some topics, they were categorized into separate codes.

The study was approved and registered by the Ethical Committee of Alborz University of Medical Sciences (IR.ABZUMS.REC.1399.009). Participation was voluntary and the interviewers obtained informed consent and permission to record the interviews from participants before starting the interviews. The interviewees' confidentiality was maintained throughout the study.

Results

The research was conducted with the participation of 16 people, whose demographic characteristics are shown in Table 1. Most of the participants (43.75%) had a nursing degree and worked as a nursing director or hospital supervisor.

Table 1. Demographic characteristics of the interviewees

Variable		Number	Percentage	Variable		Number	Percentage
Gender	Male	8	50.00%	Position	Hospital manager and president	6	37.50%
	Female	8	50.00%		Nursing manager and supervisor	7	43.75%
	Total	16	100.00%		Expert/Faculty	3	18.75%
Major	Health service management	6	37.50%		Total	16	100.00%
	Nurse	7	43.75%	Education	Bachelor	4	25.00%
	Anesthesia	1	6.25%		Master	6	37.50%
	Health management in disasters	1	6.25%		Doctoral/PhD	6	37.50%
	Emergency medicine	1	6.25%		Total	16	100.00%
	Total	16	100.00%				

Findings from the interviews were classified into four categories including mitigation, preparedness, response, recovery, and lesson learned. Table 2 shows the topics, themes, and subthemes related to the factors affecting COVID-19 management based on the experience of hospital managers.

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Table 2. Topics, themes, and sub-themes related to the factors affecting COVID-19 management

Themes	Subthemes
Mitigation	(1) Ensuring adequate staffing; (2) Having sufficient bed capacity; (3) Having sufficient space and facilities for setting up quarantines; (4) Providing personal protective equipment to staff; (5) Providing the equipment needed for diagnosis and treatment; (6) Securing the required funding; (7) Supplying necessary medicines; (8) Making arrangements for patient follow-up after discharge; (9) Having strong management and leadership
Preparedness	(1) Having a crisis committee; (2) Having a crisis preparedness and response plan; (3) Adopting appropriate measures; (4) Taking action during the COVID-19 crisis
Response	Motivating health workers: (1) Financial incentives; (2) Non-financial incentives; (3) Emotional and psychological support Cooperation and coordination: (1) Cooperation among hospital staff; (2) Collaboration with other health centers; (3) Coordi nating and cooperating with other organizations and donors, etc.; (4) Cooperation of patients and their families with medical staff and its cultural aspects; (5) Supportive policies and regulations
Recovery and lessons learned	(1) Providing facilities, equipment, and consumables; (2) Expediting patient processes; (3) Inventory control; (4) Economic conditions, patient billing, and hospital revenue; (5) Planning better for similar crises; (6) Observing the principles of passive defense; (7) Holding regular crisis committee meetings; (8) Supplying human resources; (9) Documentation and use of information systems in planning

Mitigation

Regarding the infrastructure needed to provide care in time of crisis, including quarantines, nine subthemes were extracted from the transcripts. They included ensuring adequate staffing, having sufficient bed capacity, having sufficient space and facilities for setting up quarantines, providing personal protective equipment to staff, providing the equipment needed for diagnosis and treatment, securing the required funding, supplying the necessary medicines, making arrangements for patient follow-up after discharge, and having strong management and leadership. Almost all the interviewees pointed to staffing problems and challenges (such as high turnover) that were eventually resolved to some extent. "…*As soon as COVID broke out, an 89-day contract was set up and new staff were recruited without going through the formal process. Medical specialists, including infectious disease and internal medicine specialists, were required to show up at the hospital. Reserve staff and the personnel on leave were also asked to return to work. Finally, there was no understaffing problem …*" (P1). "*…We hadn't planned for our workforce. There was a lot of fear and anxiety; people would even cry saying that they don't want to work in COVID ward. Many asked for sick leave and we had a high turnover rate. For me, the human element was very annoying, that I had to force them or convince them to work in these high-risk wards. Turnover was high, but many of them returned and this didn't become a challenge…*" (P3). As for bed capacity, the interviewees stated that "…*there were enough beds as a result of planning*…" (P11) and they *"…did not face many challenges with the shortage of beds…*" (P5). During the height of the COVID-19 pandemic, "*…elective surgeries were cancelled and outpatients were not admitted, which resulted in fewer patient visits and there was sufficient space to quarantine COVID patients…*" (P1). "*…We had enough space for quarantines and it was not a problem …*" (P10). In addition, the interviewees stated that "*… sufficient personal protective equipment was provided to the personnel …*" (P12) and even "*… some facilities were transferred from wards that had no patients to COVID wards. Missing equipment was quickly procured with the help of the deputy director of*

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treatment …" (P2). "*... Our planning was extraordinary. We had a meeting on March 20, the day that the first positive COVID case was detected in Qom. 45 to 46 million Tomans worth of clothes, personal protective equipment, and masks were purchased. On the third and fourth days, the protocol for distribution and use of these devices was written and the levels of care were defined. An occupational health specialist and an environmental health practitioner prepared the test kits according to the protocol, which were distributed every morning ...*" (P2). However, some interviewees faced problems in providing protective, diagnostic, and treatment equipment to the staff. "*... Before the university could find its footing, we bought normal 3-ply surgical masks, which used to cost 300 Tomans each, for up to 13,000 Tomans each, and N95 masks for 40,000 Tomans each ...*" (P9). "*... Initially, it was very difficult to procure the necessary equipment …*" (P16). Regarding the issue of funds, most of the interviewees believed that "*... funding was good, but there were also challenges. For example, visits to other wards [by non-COVID patients] reduced ...*" (P10). While some interviewees pointed out that "*... there were no financial problems ...*" (P5) and "*... funds were secured by the board of trustees or the vice chancellor of development ...*" (P2), a number of them criticized that "*... funds weren't sufficient ...*" (P8) and "*... were less than what we wanted to give everyone ...*" (P7). As for medication, the participants stated that at the beginning of the COVID-19 crisis, they "*... had challenges in supplying medicine, but over time the situation improved with better management of the drug distribution process ...*" (P14), for example, "*... with centralized drug distribution as per the requirement of the Ministry of Health …*" (P1). There were a number of criticisms in this regard: "*... Frankly, we paid for the drugs out of our own pockets, but didn't let it fall short ...*" (P10). All the interviewees believed that patients were followed up after discharge and "*... follow-up and reporting were done by the health promotion and infection control team. Patients could also visit the hospital if needed ...*" (P6). Regarding management and leadership, only one of the interviewees mentioned the capacity and important role of hospital management and leadership. "*... We had strong management and leadership who were present in the hospital from early in the morning till midnight ...*" (P3).

Preparedness

In relation to the issue of preparedness for emerging infectious diseases, four subthemes were extracted from the transcripts as factors affecting hospital management, including having a crisis committee, having a crisis preparedness and response plan, adopting appropriate measures, and taking action during the COVID-19 crisis. For example, most of the interviewees stated that they had a crisis committee to deal with crisis situations, including emerging infectious diseases. "*... Well, we already have a crisis committee, of course; we do have a crisis committee in our hospital ...*" (P15). Despite having a crisis committee, some of the participants noted that COVID-19 and its aftermath "*... was far beyond what the crisis team had anticipated and prepared for ...*" (P5, P6). In addition, almost all interviewees stated that they had a preparedness and response plan to respond to critical situations in the hospital. "*... Preparedness and response plans have been developed for critical situations, including emerging infectious diseases, extra bed capacity during crisis, and multisectoral collaboration. Even the hospital strategic plan addresses crisis situations ...*" (P1). However, most of the interviewees believed that "*... they have a plan, but it is not practical ...*" (P4) and had criticisms in this regard. "*... Our plan wasn't effective. COVID was a much bigger crisis ...*" (P3). "*... We had a plan, but it didn't help us that much ...*" (P13). Two interviewees also believed that prior to the pandemic, "*... relevant committees had been formed ...*" (P5), "*... necessary arrangements had been made with external organizations like the fire department, the Red Crescent, etc.*" (P1), and actions were taken in accordance with the developed plan. Furthermore, some interviewees criticized the lack of practicality, arguing that "*... plans were good on paper, but didn't work in practice ...*" (P16). Others referred

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to actions taken according to the plan, which somewhat expedited the response to the COVID-19 crisis. *"... As soon as the first COVID case was reported, we prepared according to the plan and made arrangements to prepare the wards ...*" (P3).

Response

In relation to the theme of health workers' motivation, three subthemes were extracted from the transcripts, including financial incentives, non-financial incentives, and emotional and psychological support. Most interviewees stated that during the COVID-19 crisis, "*... employees received financial incentives ...*" (P13) and "*... several gift cards with donated money were given to the staff ...*" (P10). However, some of the participants stated that "*... these benefits aggravated the problem, because not everyone was paid ...*" (P5), and therefore, "*... employees were dissatisfied with the incentives that most of them didn't receive. Naturally, this created conflict between staff ...*" (P8). Some interviewees also mentioned non-financial incentives, saying that "*… employees received a lot of praise ...*" (P14) and "*... commendation ...*" (P1) as well as "*...food aid...*" (P10) and "*... snacks including protein bars ...*" (P5). Moreover, "*... any illness among the staff would be diagnosed and treated for free, and personal protective equipment was provided to the staff and their families ...*" (P6). Most of the interviewees also referred to the measures taken in the hospital to "*... support staff and boost their morale ...*" (P16), because they believed that working during the pandemic and being away from family had weakened staff morale. For example, "*... I wrote a letter to the education board through my sister who works there, and we managed to appropriate a teacher's center to house the medical staff. Many people wanted to work at the hospital, but were afraid to return home and put their children or sick family members at risk, and these accommodations helped solve their problem ...*" (P2). "*... High-risk employees were identified and were given sick leave. Nurses received paid precautionary leave. Through a screening process, people who had problems were employed in the non-COVID wards. Accommodations were provided for all the colleagues during the pandemic, and we had staff quarantine ...*" (P3).

Regarding the theme of cooperation and coordination, five subthemes were extracted from the transcripts. They included cooperation among hospital staff, cooperation with other health workers, coordination with other organizations and government agencies, donors, etc., cooperation of patients and families with medical staff and its cultural aspects, and policies and regulations. Most of the interviewees stated that "*... cooperation was excellent throughout the hospital ...*" (P12) and "*... there was a lot of sympathy among the staff; some of them requested that their ward be dedicated to COVID patients, and many volunteered to replace the COVID ward staff who needed to take time off. We even sent volunteers to Hospital X ...*" (P10). However, one of the interviewees stated that sometimes there was a lack of cooperation and coordination in coverage and shift schedule across COVID-19 wards. "*... The medical staffs assigned to this ward were terrified. There were few volunteers. As the situation got worse, we had to increase the number of wards, but it was very difficult to increase the number of beds and staff. As a result, cooperation and coordination were sometimes lacking. For example, a large number of staff left under the pretext of pregnancy and illness ...*" (P3). Three of the interviewees stated that they faced problems and challenges in cooperating with health personnel, challenges that could have very bad consequences for the healthcare sector in the critical context of the COVID-19 pandemic and the fast spread of the disease. "*... We faced many problems and challenges. PCR test results came within six hours, but ours took 3 to 4 days, which made it difficult for us to know what to do with the patient. Everything depended on these results. It even became a problem for dead patients, because the process was different for those with COVID ...*" (P7). Meanwhile, almost all the interviewees noted that "*... all institutions and agencies cooperated ...*" (P14) and that they "*... did not face any challenges with any organization. All organizations*

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were very cooperative. Many problems [i.e., the stress and fear of going home] were resolved by housing health workers in teacher's centers that cooperated. Unions also cooperated very well …" (P2). Interviewees noted that "*… [a lot of supplies] were procured with the help of donors, and some even donated ventilators …*" (P9). The participants believed that all organizations, especially charities that could play an important role during the COVID-19 crisis, cooperated and coordinated well with hospitals and the health system in general. However, most of the interviewees pointed out that "*… patients and their companions were less cooperative, but it was normal; the situation was quite difficult …*" (P11). They also criticized the interaction of patients and their companions with the medical staff and the resulting problems and challenges: "*… We cooperated a lot with patients! [with a bitter smile] Families were seriously frightened. They kept asking about PCR test results. 'Our patient is healthy, why do you keep him in the COVID ward? Why put him in ICU?' We had a problem with patient deaths ... We even got into fights with the families of the deceased …*" (P7). Of course, two of the interviewees stated that the patients and their families fully cooperated with the medical staff with very rare exceptions. "*… They were cooperative. This was the patients' first experience of not having a companion. But because of the fear of COVID, there was very little confrontation and protest by the patients. There were perhaps less than 7 cases during this whole period that did not take the disease seriously and protested that they wanted to have companion …*" (P2). Finally, all the interviewees acknowledged that "*… high-level policies were very helpful in meeting the challenges of hospitals, including the 89-day recruitment contract, COVID incentive payment authorization that increased staff motivation, the social distancing program that reduced the burden of hospital visits …*" (P1). "*… Alborz governor's office did a really good job. It took timely action with social distancing and closures …*" (P15). The participants also talked about the importance and impact of policies and regulations in managing the COVID-19 crisis and improving the current situation. Some acknowledged the positive impact of certain policies, saying that "*… quarantines were effective, but the directives were numerous and difficult to manage …*" (P6). There were also criticisms in this regard: "*…I wish policies like social distancing and quarantines would be implemented sooner. We had seen what happened in China and knew that this disease might enter Iran. We should have planned before the pandemic started to reduce casualties. Regarding the policies of the Ministry of Health and the university, I must say that the directives were late …*" (P10).

Recovery and lessons learned

Finally, regarding issues that require more attention, nine subthemes were extracted from the transcripts They included providing facilities, equipment, and consumables, expediting patient processes, inventory control, economic conditions, patient billing, and hospital revenue, planning better for similar crises, observing the principles of passive defense, holding regular crisis committee meetings, supplying human resources, and documentation and use of information systems in planning. The interviewees stated that "*… more attention should be paid to the provision of consumables such as face masks, gloves, and personal protective equipment …*" (P1). Respondents believed that in order to improve planning for dealing with critical situations like the COVID-19 pandemic, we should "*... modify processes so that patients can be diagnosed and treated faster …*" (P8). "*… As soon as COVID appeared, we ran out of supplies and consumables in the hospital. If we had more time, we would be able to anticipate shortages and stock up, because it was really difficult to supply these materials at the height of the crisis …*" (P13). In their opinion, it was important to pay attention to patient billing and hospital revenue: "*… The issue of patient billing was a huge challenge. The Ministry's directives weren't clear. It was the first time they said that people without supplementary insurance should be treated for free. Well, the public heard this and there were cases where people with a 6 to 7 million Toman*

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bill and with supplementary insurance and ability to pay were discharged for free, which cost the hospital a lot of money. A lot of patients didn't go to the hospital for fear of COVID; the number of cases almost hit zero, and hospital revenue plummeted during this period. Many of my colleagues are worried about what they will receive. The government seemed to blame itself for the spread of the disease and wanted to bear all the costs. It would be better if the directive on the costs of the disease was written more clearly …" (P2). Also, "*… it would've been better to select several hospitals in isolation and not involve every hospital with COVID …*" (P5). In addition, interviewees proposed other measures that they believed could promise better planning to prepare for, deal with, and manage crises like the COVID-19 pandemic: "*… Promoting and observing the principles of passive defense …*" (P11), "*… crisis practice and planning for possible scenarios …*" (P5), "*… holding crisis committee meetings on a daily basis, examining problems and making decisions about addressing them …*" (P3), "*… planning and preparing for crisis situations …*" (P16), "*… dedicating several hospitals to COVID …*" (P6), "*… providing financial assistance to families or distributing health consumables to reduce traffic, and continuing quarantines …*" (P10). According to one of the participants, "*… if a number of hospitals were dedicated specifically to COVID and the rest of the hospitals were allowed to return to normal, there wouldn't be so much conflict and expense. Management should also be reviewed at the hospital and university levels. We must learn from the bittersweet experiences of COVID. We must have crisis depots in all areas …*" (P10). Most of the participants highlighted the importance of "*… having an adequate and motivated workforce in COVID hospitals …*" (P15) and "*… the need for workforce planning…*" (P3). "*… We should have more health workers than needed. For example, nursing centers should have both professional nurses and paramedics, because [in situations like COVID], the patient is not accompanied by anyone. There should be enough paramedics …*" (P3). They also stated that staffing is one of the most important issues that should be given more attention in order to improve planning and respond better to crisis situations like COVID-19. "*… We still have challenges in staffing …*" (P14) and "*… better planning is needed to supply the necessary workforce for crisis situations …*" (P8). A number of interviewees also highlighted documentation as a necessary element of proper planning: "*… [If I had the opportunity to plan] … I'd start documenting and dashboarding from the start. If it had been done from day one, it would've helped us much more …*" (P4).

Discussion

The purpose of this qualitative study was to identify and investigate the difference between factors affecting hospital management which considered in preparing a disaster management plan in the face of a pandemic. The findings were categorized into four main groups including mitigation, preparedness, response (staff motivation, cooperation, and coordination), recovery and lesson learned.

The main factors affecting hospital management were preparedness and necessary infrastructures pre-COVID; and response like staff motivation as well as cooperation and coordination during the COVID. Ineffective approach of the whole government and the whole society in managing the spread of the virus, insufficient personal protective equipment and supplies, and indecisive governance are the biggest policy challenges to combating COVID-19 in Iran (20). It is clear that timely diagnosis and effective prevention, control, and better management of COVID-19 require adequate production, continuous development, and sustainable distribution of medical equipment, products, supplies, and technologies (7).

The factors suggested by the WHO such as communications, continuity of essential health services, testing capacity, human resources, operations support and logistics, especially drug supply, essential support services, infection prevention and control, case management, surveillance, and laboratory services are essential for the rapid response of health managers and planners to COVID-19

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(21). In addition, the Centers for Disease Control and Prevention (CDC) suggests 10 elements for hospital preparedness during COVID-19, including structure for planning and decision-making; development of a written COVID-19 plan; elements of a COVID-19 plan; consumables and durable medical equipment and supplies; identification and management of patients; visitor access and movement within facilities; occupational health; education and training; and health services and surge capacity (22). Many of these factors are also common challenges for all hospitals and their management team.

In the present study, one of the main themes was hospital preparedness for emerging infectious diseases. Having a plan reduces many of the unfamiliar aspects of the crisis while reducing stress among employees. Crisis response must be real and practical (23). Seyedin et al.(24) identified six components of crisis management programs, including risk perception, trust, flexibility, inclusion, adaptability, and equity. As the participants in the present study noted, COVID-19 went far beyond their plans and preparations. Therefore, it is necessary to generalize the programs that could be applied in any situation before developing a crisis plan.

Another identified theme was the required infrastructure. Indeed, infrastructure forms the basis for emergency action. Regardless of how strong and prepared the management team is, crises cannot be controlled if they do not have the necessary infrastructure such as beds, staff, medicines, and equipment. In this regard, Schultz et al.(25) found that lack of surge capacity, qualified staff, and financial resources are the most important problems of hospitals in the time of crisis. Milsten identified communication failure and resource shortages as key challenges for hospitals in disaster preparation (26).

Abbaszadeh et al.(27) investigated nurses' perception of care during emerging diseases and found that the threat to the lives of nurses, job stress, inadequate training, lack of clarity regarding the effectiveness of prescribed drugs, and insufficient standard protective equipment were key challenges. According to the findings of the present study, ensuring the safety of staff and providing the necessary supplies and personal protective equipment were identified as important factors.

Medical staff can prevent the transmission of infections by applying standard precautions such as disinfection, isolation, and hand hygiene, and by avoiding exposure to contaminants (17). In addition to having medical resources and equipment, other factors such as motivation, perceptions, values, and individual orientations affect health behaviors and approaches (28).

Employee motivation is one of the most important components of any system, and in the present study, the issue of motivating and supporting medical staff was brought up numerous times by the participants. Iman et al.(29) showed that most nurses had a moderate knowledge of crisis management. They found a direct relationship between the level of education, type of shift work, participation in crisis exercises, and membership in the crisis committee and people's knowledge of crisis management. Krajewski found that training related to employee preparedness should be increased to reduce stress during crisis (which increases to 45% in staff, especially nurses) (30). The medical staff must have good quality of work life to be able to provide the desired care to patients (31). Evidence suggests that job stress among medical staff can adversely affect patients' health as well as important organizational outcomes such as productivity (32).

Public health programs will not be effective without the cooperation of the entire population. Especially in the case of rapidly spreading communicable diseases such as the novel coronavirus, cooperation of offices and markets, universities and schools, and in general the whole society is crucial. Wang et al.(33) evaluated 10 hospitals in Taipei in terms of communication and concluded that every hospital had established communication networks, but none had good collaboration with the media. The effectiveness of crisis management increases by mutual learning, interorgan-

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izational coordination, and building trust between the organizations involved. In crisis situations, organizations do not communicate with each other efficiently, but this is crucial for emergency response and recovery. Organizations need to carry out their responsibilities within the framework of crisis management, and coordinate and cooperate with other agencies (34, 35).

The results of the study showed that multisectoral collaboration existed without significant barriers, and there were also few challenges within the health system. However, high stress and workload at all levels of the health system and lack of a clear plan or framework for multisectoral collaboration are noteworthy.

It is clear that managing the COVID-19 crisis requires professional efforts, multisectoral collaboration, and the participation of government agencies (14). For instance, NHS England and NHS Improvement in collaboration with the Independent Network of Health Care Providers (IHPN), and the Independent Health Care Providers (IS) have reached a national agreement to provide all the capacity and resources available in each area in the UK to respond to Coronavirus. It includes agreement to consider all inpatient facilities and available staff to provide health services (36).

Finally, the interviewees highlighted a number of challenges and improvements in areas of facilities, equipment, human resources, and information systems that required more attention.

Studies have shown that empowering human resources and developing training programs with a national strategy can have a positive effect on hospital management in times of crisis (37-39). Therefore, it is important to anticipate crises and take the necessary measures to deal with them in order to minimize losses and damages.

An organization ability to perform the assigned tasks effectively is dependent on the quality of the decisions made in the organization, and the quality of the information on which the decision is made (40). The use of health information and research results is needed in this field to provide educational, research and development purposes of medical and paramedical sciences, improve the quality of treatment, optimize the management methods of health centers, reduce the cost of centers, etc. (41). The findings of the present study confirm the necessity of documentation and recording of information. There are many lessons to be learned from the COVID-1 pandemic, which highlights the importance of collecting evidence and documents from different sources and the need for further research in this field.

Conclusion

The results of this study illustrated the need for preparedness to deal with emerging crises by establishing a crisis committee and having the infrastructure and resources needed to provide care in the time of crisis, including funds, beds, workforce, equipment, facilities, etc. Motivation of human resources, including financial and non-financial support, is also a key factor, as well as collaboration within and outside the sector and planning, which enable an appropriate response to and effective management of the COVID-19 crisis. However, it must be noted that in crisis situation such as the COVID-19 pandemic, the absence or failure to adequately supply each of the above elements will lead to poor performance and cause irreparable damage to hospitals and the health system.

In order to overcome similar crises, it is crucial to not only have the necessary infrastructure, but also plan for fair distribution of resources and effective supply chain management. A mechanism should also be developed at the national level to anticipate future health crises and to prevent and control diseases in the most effective way.

Limitation

One of the main limitations of the study is that the current study was conducted in one province in Iran. Therefore, the conditions of that province, including the covered population and provincial policies regarding the management and control of the pandemic, affect the way hospitals are managed.

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Conflict of interests

The authors declared no conflict of interests.

Author's contributions

Najafi M designed research; Najafi M and Seyed Mahmoudi M, and Vaziri-Seta M conducted research; Najafi M and Seyed Mahmoudi M, and Arab M analyzed data; and Najafi M, Rajaee R, Pouragha B, Nazari M wrote the paper. Seyed Mahmoudi M had primary responsibility for final content. All authors read and approved the final manuscript.

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