



Challenges of Maintaining the Quality of Hospital Services during the Coronavirus Pandemic in Iran

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Abstract

Background: Hospitals are the main providers of health services during an epidemic. Given their involvement in human life, it is especially vital that they maintain consistent high-quality services.

Objectives: This study aimed to identify the challenges in the resilience of hospital service quality during the coronavirus pandemic.

Methods: This qualitative study was conducted using a content analysis method in the last quarter of 2021 and the first quarter of 2022. Seventeen senior and middle managers of Shiraz University of Medical Sciences and from affiliated hospitals assigned as coronavirus centers were included in the study. Data were analyzed using Graneheim and Lundman's method in the MAXQDA 2020 software.

Results: Challenges affecting the quality of hospital services during the pandemic were summarized under 9 main themes, namely "providing human resources, resolving extra-organizational issues, providing tools and equipment, treating psychosomatic disorders, resolving pharmaceutical issues, hospital management, nature of the disease, providing financial resources, and providing physical infrastructure," and 58 sub-themes. Senior and middle managers introduced human resources as the main challenge.

Conclusion: Resilience of hospital service was one of the governing indicators of the Ministry of Health during the coronavirus pandemic. Despite many efforts in this field, there are still numerous challenges in the country's hospitals, highlighting the need for planning to prepare hospitals for epidemic conditions.

Keywords: Coronavirus, Pandemic, Resilience, Service quality

1. Background

As hospitals serve as the primary providers of health services (1) during disease outbreaks and crises, it is of utmost importance for hospitals to uphold their resilience by effectively handling a surge in patient numbers, while maintaining their performance and ensuring a continuous supply chain of high-quality services (2).

Quality of health services can be characterized as clinical effectiveness, patient safety, patient-centeredness, continuity of care, timely care, efficiency, and justice. However, the resilience of health service quality becomes evident when the quality of services faces challenges and conditions are susceptible to changes (3). Continuity in delivering quality services reflects the resilience of service quality. In simpler terms, hospitals should demonstrate optimal accountability and performance in delivering high-quality healthcare services, even in challenging and adverse circumstances, just as they do under normal conditions (4).

Resilient hospitals successfully navigate crises by engaging in proactive planning, preparation, and adaptability, while maintaining low costs (5). Conversely, when resilience is diminished, it leads to a decline in the quality and efficiency of hospital performance (6, 7). Additionally, it poses risks to the

well-being of patients and staff, decreases their quality of life, reduces job satisfaction, hinders hospital preparedness, and disrupts normal operations (8, 9).

Resilient hospitals rely on government support, sufficient resources, and a robust management system to uphold quality services (10, 11). However, during the COVID-19 pandemic, many hospitals in Iran faced difficulties in maintaining regular operations due to the lack of certain resources, especially personnel and specific drugs, and the unpredictable nature of the pandemic (2). The virus spread rapidly, posing significant health challenges not only to Iran but also to countries worldwide (12). The pandemic caused a large number of infections, overwhelming healthcare systems' capacities, and ultimately a significant worldwide death toll (13). The disease affected approximately 10% of the population and caused a 0.18 mortality rate within a short period in Iran (14). This phenomenon presented challenges in Iranian hospitals regarding the supply chain of medication, equipment, consumables, protective gear, human resources, job burnout, inadequate medical facilities, and insufficient control over the transmission chain. These challenges have had an impact on the quality of healthcare provided (15). Additionally, it was almost impossible to provide optimal care for patients

suffering from COVID-19 since the heavy protective clothing of the workers caused movement restrictions to perform their duties. The employees also faced exhaustion due to heavy workloads, fear of contaminating the disease themselves, and a decrease in the quality of the services provided (16).

At the onset of the pandemic, most hospitals in the country were challenged because of unpreparedness. The growing number of patients, multiple disease peaks, and prolonged pandemic led to numerous challenges for hospitals, disrupting care delivery and raising the mortality rate. In this regard, identifying the factors that reduce the resilience of service quality is important for improving hospital performance.

2. Objectives

This study was conducted to examine the challenges of hospital service quality resilience during the COVID-19 pandemic in Iran.

3. Methods

3.1. Study Design

The present phenomenological study was qualitative research conducted using a content analysis method in the last quarter of 2021 and the first quarter of 2022.

3.2. Study Sample

The study population consisted of senior and middle managers from Shiraz University of Medical Sciences and affiliated hospitals assigned as coronavirus centers. The university samples included nursing deputies, infection control supervisors, the head of the accreditation office, and the personnel of the treatment supervision office. In Shiraz teaching hospitals, the samples included hospital managers,

nursing managers, infection control supervisors, patient safety coordinators, head nurses, the personnel in charge of hospital quality improvement, general practitioners, infectious disease specialists, and internal specialists (Table 1).

Seventeen semi-structured interviews were conducted in total. The participants were purposefully selected from the senior and middle managers from Shiraz University of Medical Sciences and affiliated hospitals who had been serving coronavirus patients since the pandemic outbreak or those who assessed the hospitals directly during the pandemic.

3.3. Research Instrument and Data Collection Methods

An interview guide was used to collect data. The required data were gathered through individual interview sessions using a guide, recording the voice, and taking notes. Prior to the interviews, a guide was provided to the interviewees in person or electronically. The participants were then interviewed at their workplace according to their opinions and prior coordination. They were first asked about their demographic information, including age, occupation, job position, work experience, and education level. The interview guide questions started with the following open-ended question: "How is the quality of hospital services during the coronavirus pandemic?" The participants were then asked about the challenges of resilience in hospital service quality. Each interview lasted 50-80 min, prior to which the interviewee was asked for permission to record the interviews. Each interview was coded to maintain the confidentiality of the participant's point of view.

3.4. Data Analysis Method

Data collection and analysis were performed simultaneously based on the method proposed by

Table 1. Participants' demographic information

Participants	Gender	Age	Occupation	Work experience	Education level
1	Female	55 years	Head of Accreditation Office	28 years	Master of midwifery
2	Female	36 years	Nursing deputy	11 years	PhD in nursing
3	Female	44 years	Infection control supervisor	22 years	Master of nursing
4	Male	53 years	Hospital manager	23 years	Master of healthcare services management
5	Male	30 years	Corona ward nurse	6 years	Bachelor of nursing
6	Female	53 years	Nursing manager	26 years	Bachelor of nursing
7	Female	32 years	Hospital quality consultant	10 years	Master of healthcare services management
8	Female	48 years	Hospital infection control supervisor	26 years	Bachelor of nursing
9	Male	30 years	Corona ward doctor	2 years	Internal specialist
10	Female	37 years	Patient safety specialist	15 years	Bachelor of nursing
11	Male	37 years	Corona ward doctor	9 years	General practitioner
12	Male	33 years	Corona ward doctor	5 years	General practitioner
13	Male	37 years	Treatment supervision staff at the University, and Nursing Deputy of Health Minister	12 years	Master of nursing
14	Male	43 years	Corona center infectious disease specialist	14 years	Infectious disease specialist
15	Male	45 years	Hospital manager	12 years	PhD in healthcare services management
16	Female	34 years	Quality improvement specialist	9 years	Master of healthcare services management
17	Female	37 years	Corona ward head nurse	14 years	Bachelor of nursing

Graneheim and Lundman, the steps of which include: 1) transcribing the interviews and reviewing them several times in order to gain a proper understanding of all the transcribed statements; 2) extracting the semantic units and categorizing them as compact units; 3) summarizing and categorizing the compact units and selecting appropriate labels for them; 4) sorting the subcategories; and 5) selecting an appropriate title that could cover the resulting categories (17).

Immediately after each interview, the recorded interviews were transcribed verbatim in the shortest possible time (within 24 hours after the interview). The analysis process began thereafter.

Through the analysis, the transcripts were first read line-by-line and the important paragraphs were marked, following which the analysis units were identified. In the present study, the entire text of each interview was considered the analysis unit. Next, the semantic units were determined: they were statements related to the resilience challenges of hospital service quality. The coding was then performed using MAXQDA 2020 software. Once all the data were coded, they were compared based on their conceptual commonalities and differences, and codes that were conceptually similar were classified into more accurate and abstract concept classes. Finally, the concepts were compared iteratively, and the content embedded in the data was identified as the main theme.

2.5. Quality Criteria

To increase the accuracy and precision of the study, Guba and Lincoln criteria, which included credibility, dependability, confirmability, and transferability, were used (18). To ensure data credibility, sufficient time was allocated for data collection and checking the findings with the participants, and in the data collection process, an attempt was made to consider the maximum variety required for sample selection was considered in the data collection process. Regarding confirmability, the transcripts of some interviews and the extracted codes were provided to two faculty members of the healthcare management department, who were experts in qualitative research analysis but had not participated in the research, and the accuracy of the data coding process was examined. The data were checked by the participants and research team who confirmed the dependability and accuracy of the coding process. To create data transferability, a full description of the issue along with the participants' characteristics, data collection and analysis methods, and quotations of the participants were provided.

2.6. Ethical Considerations

In this study, the required permits were initially obtained from Iran University of Medical Sciences

and Shiraz University of Medical Sciences. Subsequently, verbal informed consent, individuals' privacy, confidentiality of the information, and participants' right to withdraw from the research were considered.

Table 1 presents the participants' demographic information. Seventeen participants aged 30-55 years were interviewed. The mean age of the subjects was obtained at 40.5 years, of which nine participants were female and eight were male. The mean work experience of participants was estimated at 14.37 years. Regarding their education level, seven participants held bachelors, five had a master's degree, two were general practitioners, and three had PhD degrees.

4. Results

Challenges of hospital service quality resilience during the COVID-19 pandemic were classified under 9 main themes, namely providing human resources, resolving extra-organizational issues, providing tools and equipment, treating psychosomatic disorders, resolving pharmaceutical issues, hospital management, nature of the disease, providing financial resources, and providing physical infrastructure, encompassing 58 sub-themes (Table 2).

3.1. Providing human resources

One of the keys to providing quality services is the presence of specialized medical staff. During the rapid spread of COVID-19, Iranian hospitals encountered an increase in the number of patients. As some staff became infected and some left work, hospitals faced a dramatic shortage of human resources, especially nurses, infectious disease specialists, and trained personnel. This led to a heavy workload, a probability of errors, and reduced service quality.

One participant stated: "...COVID-19 patients needed lots of care. In some shifts, a nurse with seven or eight critically-ill COVID-19 patients suffered from fatigue and made medical mistakes. Due to the severe shortage of staff, nurses were infected with COVID-19 and went on sick leave." (Participant 6)

"...We faced a shortage of infectious disease doctors in the hospital. Sometimes we had to seek help from residents or other specialists who did not have the experience and knowledge of the disease to treat the patients." (Participant 13)

Another challenge was the insufficient support for the staff in terms of job security and motivation, causing dissatisfaction and ultimately providing a lower quality of care. Sometimes even the medical staff were unable to communicate effectively with the patients during the pandemic period due to their fear and anxiety.

"...Personnel indifference was because of their

Table 2. Main themes and sub-themes on challenges of hospital service quality resilience

Main themes		Challenges of Hospital Service Quality Resilience							
Themes	Human resources	Extra-organizational issues	Tools and equipment	Psychosomatic disorders	Pharmaceutical problems	Hospital management	Nature of disease	Financial problems	Physical structure
Sub-themes	1. Insufficient infectious disease physicians 2. Insufficient trained personnel 3. Insufficient nursing staff 4. Lack of job security, and staff apathy 6. Increased workload and quitting the job 7. Using the workforce of other wards 9. Losing the staff due to their infection with COVID-19 10. Insufficient knowledge of specialists 11. Lack of effective communication with patients	1. Lack of appropriate guidelines and constantly changing them 2. Difference between national and international guidelines 3. Insufficient supervision over the implementation of guidelines 4. Lack of proper awareness and culture in society 5. Fear of people and families of medical staff 6. Lack of cooperation between hospitals and medical equipment companies 7. Lack of timely vaccination	1. Insufficient PCR tests for personnel 2. Insufficient disinfectants 3. Insufficient personal protective equipment 4. Shortage of oxygen supply equipment 5. Lack of medical equipment 6. Lack of ambulance	1. Personnel depression 2. Personnel's fear of COVID-19 3. Personnel's job burnout	1. Intensification of drug resistance 2. Excessive use of drugs 3. Medication inadequacy 4. not managing patients' medication needs	1. Poor hospital crisis management 2. Constant change in the type of service provision by the hospital 3. Lack of formation of hospital committees 4. Reduction of rounds and in-hospital evaluations 5. Unawareness of the use of personal protective equipment 6. Unfair allocation of beds to patients 7. Impossibility of teleworking of hospital administrative staff 8. Low-speed determination of patients' conditions and long waiting queues 9. Disrupting students' educational programs	1. Banned from visiting patients 2. Making problems for other patients 3. Increased risk of falls 5. Lack of attention to nosocomial infections and their increasing rate 6. Unknown nature of the disease	1. Cost of PCR test 2. Increased costs of personal protective equipment 3. Decreased hospital revenues 4. Low staff salaries and benefits 5. Insufficient budget to provide required medicine and medical equipment 6. Creating induced demand 7. Economic sanctions	1. Undesirable ventilation systems 2. Lack of special beds 3. Low capacity of hospital cold stores 4. Lack of two-step triage 5. Structural problems and lack of space

insufficient and delayed payments. This made them less focused on providing correct treatment processes." (Participant 5)

"...Patient care isn't only IV therapy or serum therapy, but some part of the care process is communications. The communication was poor because our colleagues were afraid of the disease." (Participant 2)

3.2. Resolving extra-organizational issues

During the coronavirus pandemic, some hospital procedures were influenced by the decisions of upper-hand organizations (e.g., decisions on vaccination or developing a guideline), or in collaboration with other organizations or individuals. These extra-organizational issues sometimes prevented the provision of quality care.

"...Our other challenge was untimely vaccination of the staff and the community." (Participant 13)

New guidelines for the treatment of the disease were issued by the Ministry of Health; however, inadequate development of them as well as the discrepancy between the national and international guidelines was recognized as a challenge.

"...Rational drugs weren't included in the guidelines. Drugs such as hydroxychloroquine, zinc, and vitamin C are still being prescribed. Another important challenge is related to national guidelines, which are very different from international guidelines. They did not allow us to perform many treatments due to expediency, but the drugs announced by the international guidelines were effective. The national

protocol was not useful for me as a physician." (Participant 9)

Increased collaboration between hospitals, corporations, and the community is essential for maintaining an effective and safe treatment environment; nevertheless, it was weak at the beginning of the pandemic.

"...At the beginning, hospital staff was rejected by people. Even the taxis were unwilling to carry our staff. Many of the things we wanted to do inside the hospital were not cooperated with contractors. Our important tasks were delayed and affected the quality of care. In the beginning, we had problems with the cooperation of other hospitals. They didn't admit referred patients." (Participant 6)

"...Medical devices, including ventilators, which were urgently needed by patients, were not calibrated." (Participant 5)

3.3. Providing tools and equipment

The prevalence of the coronavirus exceeded the existing capacity of hospitals. Along with the disease outbreak, the lack of equipment for prevention, diagnosis, and treatment appeared to be the most serious challenge for hospitals, affecting their quality performance.

"...Personal protective equipment and hand rubs were not available to personnel during the pandemic. It endangered the safety of personnel and patients." (Participant 13).

"...Another problem is the lack of PCR testing. No suspicious personnel were able to take the test

immediately. Sometimes it was performed late and the disease was transmitted to other colleagues." (Participant 7)

"...There was a shortage of ventilators. We only had two. If the patient's condition worsened, we didn't have a ventilator for him. The patients' lives were endangered." (Participant 12)

One of the main challenges during the coronavirus crisis was the supply of oxygen needed by the patients in regular and special wards, which was the worst experience for hospitals during the pandemic.

"...Our oxygen system didn't respond to the hospital's need at all. Sometimes it suddenly had a severe oxygen drop, and the patients suffered from many injuries as well as death." (Participant 6)

3.4. Treating psychosomatic disorders

The high prevalence of COVID-19 and the long duration of this pandemic caused depression and job burnout among the staff, especially nurses who provided direct care to patients and experienced heavy workloads, fear of infection, and frequent deaths. High physical and mental pressure on personnel seriously threatened quality care.

"...There was a huge wave of depression among the staff. They couldn't mourn for their loved ones. They felt guilty that going to the hospital and returning home had caused their families to get the disease and die. They were suffering from burnout due to overwork, fatigue, and witnessing the deaths going on." (Participant 4)

"...Excessive fear of the staff prevented patients from receiving good care. Many corona patients had cardiac arrest. The CPR staff were afraid to resuscitate or provide services. Well, this would increase mortality." (Participant 9).

3.5. Resolving pharmaceutical issues

Drug therapy is the most commonly adopted treatment strategy. With the rapid spread of the coronavirus and the lack of specific treatment by physicians due to their fear and unawareness, efforts to control and treat this disease led to the indiscriminate administration of various medications and antibiotics. This approach brought about some problems in terms of the misuse of drugs and antibiotics, leading to a lack of drugs, intensification of drug resistance, and the occurrence of drug side effects.

"...Apart from the lack of the main COVID-19 drugs, such as Remdesivir, we also had problems with the supply of regular medicines, like famotidine, intravenous vitamin C, and naproxen. Even serum samples are scarce. It is ridiculous because serums that contain water and salt are scarce in the country." (Participant 11)

"...There was no specific treatment for COVID-19. Doctors prescribed various antibiotics, corticosteroids, and vitamins improperly, which caused drug

resistance, or dexamethasone was prescribed so much that patients with high blood sugar were referred back to us." (Participant 9).

3.6. Hospital management

Hospitals were at the forefront of the healthcare system in the face of this crisis. Health managers and policymakers in Iran had never experienced an infectious disease epidemic. The unexpected condition and the unpreparedness to face the pandemic as well as delayed decisions led to poor management of the crisis in the early days.

"...In general, crisis management was extremely poor, especially in the early days in hospitals that admitted both corona and non-corona patients. In towns, too, the initial prediction was poor, the emergency room was filled with corona patients. Besides, division of the staff and allocation of beds for the care of COVID-19 patients were not done properly." (Participant 9)

Even hospitals faced challenges, such as not forming hospital committees, lack of intra-ward visits, impossibility of staff teleworking, low-speed determination of patients' conditions, and long waiting queues, which were not properly managed as hospital processes.

"...Almost no committee was formed, except for a continuous crisis committee. Another challenge was teleworking, which caused staff dissatisfaction. Some administrative units were not in direct contact with clients. They took a strict look at this issue, which caused a large number of staff members to get infected." (Participant 7)

"...During the epidemic, rounds and evaluations became much less and limited." (Participant 6)
 "...Sometimes the patients waited long for a decision to be made due to the lack of specialist doctors and empty beds." (Participant 2)

3.7. Nature of the disease

Owing to its high prevalence and unknown routes of transmission and treatment, COVID-19 created a sudden crisis in hospitals. The resulting problems caused nosocomial infections to be less considered during the pandemic, and nosocomial infection rates increased owing to the long-term hospitalization of patients in intensive care units (ICUs) and the use of ventilators.

"...When a hospital turns all its wards into ICUs and the patients go under ventilators, they become susceptible to all kinds of nosocomial infections and those rates change." (Participant 3)

"...The disease was unknown. We didn't know exactly that oxygen, medicine, or equipment was needed at all times." (Participant 9)

Strategies aimed at social distancing were implemented in wards, such as the patients being visited and not letting them have companions. Due to the lack of facilities for safe care in Iran, the risk of

patient falls and their dissatisfaction increased.

"...Most of the patients were old, there were few nurses, and companions weren't allowed in the ward. This increased the number of patient falls and their dissatisfaction." (Participant 6)

3.8. Providing financial resources

Financial problems and insufficient budgets are serious obstacles to meeting the basic needs of any organization. In Iranian hospitals, this issue was more interruptive during the COVID-19 crisis than before. The rapid spread of the disease and the detrimental effects of sanctions reduced access to medicines and rescue equipment, exacerbated pre-existing health problems, and even delayed the payment of staff salaries and benefits.

"...The universities of medical sciences and the Ministry (of Health) were seeking to supply the drugs, but due to the conditions of the country, the sanctions had a great impact on the supply of drugs. On the other hand, hospital debts to pharmaceutical companies caused problems. Some pharmaceutical companies even had medicine but did not provide it to hospitals." (Participant 1)

"...The staff overworked. Their overpayment and corona bonus were paid too late and in small amounts." (Participant 17)

Following the coronavirus pandemic, along with an increase in the number of patients in the first months, necessary capacities for the production of personal protective equipment, disinfectants, and polymerase chain reaction (PCR) testing in Iran were not provided yet. As consumption increased and shortages appeared, manufacturing companies raised their prices.

"...Hospitals faced a shortage of funds. A mask, which was 0.08 dollars, became 1.4 dollars. Patients complained about the high cost of COVID-19 tests. Public laboratories gave test results approximately two days later. Sometimes patients had to take the test in private laboratories, and it was costly for them." (Participant 10)

Hospitals' revenues declined with the cancellation of elective surgeries and the change in hospital use to become COVID-19 centers. Occasionally, physicians made induced requests in private hospitals.

"...Before the COVID-19 pandemic, it was an orthopedics center and was profitable. The university treated the orthopedic hospital the same way as the internal hospital. It affected the staff's fee-for-service, caused dissatisfaction in staff." (Participant 8)

"...Our hospital was private and worked with the university during all the peaks. Sometimes doctors would induce demand to increase hospital revenue, prescribing COVID-19 tests and CT scans for all patients." (Participant 5)

3.9. Providing physical infrastructure

One of the most important factors affecting the

quality of care is proper physical structure. During COVID-19, one of the main problems of most hospitals in the country was the lack of structural standards, hospital beds, negative pressure ventilation in wards, sufficient space to provide care, and two-step triage.

"...Unfortunately, these hospitals lacked a structural standard. No emergency room was dedicated to the management of this disease. Due to insufficient space, a two-step triage could not be performed." (Participant 2)

"...Another problem is hospital ventilation. We did not have a HEPA system for the ICU ward." (Participant 7)

"...Our hospital was facing a shortage of ICUs. We did not know what to do when the patients' condition worsened." (Participant 6)

5. Discussion

One of the main tasks of the Ministry of Health is maintaining the quality of hospital services under all conditions. Given that hospitals play the most important role in providing services during epidemics, the present study was conducted to identify the challenges of resilience in hospital service quality during the COVID-19 pandemic in Iran.

According to the participants, one of the main challenges in the resilience of hospital service quality is human resources. During the rapid spread of COVID-19, Iranian hospitals encountered an increase in the number of patients, and as some staff became infected and some left work, hospitals faced a dramatic shortage of human resources, especially nurses, infectious disease specialists, and trained personnel in ICUs. This led to an increased workload, probability of mistakes, and reduced service quality. In a study by Plagg et al. in Italy, access to trained intensive care physicians and nurses was limited during the pandemic (19). Li et al. in China stated that the shortage of nurses during the pandemic increased as they became infected with the disease, leading to heightened workloads for the remaining nurses. All of these factors affected the quality of services, which was consistent with the results of the present study (20). It seems that training hospital personnel in the field of ICUs and infectious diseases can be a useful intervention to reduce the challenges of resilience in hospital service quality.

The findings of the present study showed that nurses were not able to communicate effectively with patients during the crisis of the COVID-19 pandemic due to fear and anxiety caused by the outbreak of the disease and the ways in which it was transmitted. However, Vitale et al. in Italy indicated that from the patient's point of view, the quality of nurse-patient communication during the pandemic did not change significantly, which was not consistent with the results of the present study (21). It is possible

that the country's education system and the media performed poorly in training and informing the staff and public about how to deal with the pandemic.

In this study, some participants reported that job insecurity and short-term contracts with staff caused anxiety, stress, and reduced concentration among staff, and contributed to the incidence of medical errors. In their study, Malekzadeh et al. stated that the employment status of many personnel was contractual, and they were skeptical about job security, which was in line with the results of the present study (22). It seems that job security is one of the key factors in increasing staff satisfaction and improving the quality of services in any organization, the absence of which will cause stress, increased dissatisfaction, and lower personnel performance.

In the present study, the challenges of extra-organizational issues were addressed. The lack of appropriate guidelines, insufficient monitoring of guidelines, and constant changes in protocols affect the quality of services. In their study, Garosi et al. found that dissemination of unreliable information, inconsistencies in the existing guidelines, and nurses' unawareness of coronacare protocols were among the challenges (23). In line with the present study, Saberian et al. stated that during the pandemic, the supervision of hospitals was reduced, affecting service quality (24).

In the current study, the participants stated that the prevalence of the disease and the resulting limitations led to the cancellation or limitation of intra-organizational assessments and safety rounds in hospitals. Consequently, issues related to safety and improvement in the quality of services were not considered. Fazaeli et al. reported in their study that the recommendations for reducing traffic in corona sections led to a reduction in visits and supervisions, which affected the quality of staff performance (25). It seems that this challenge can be solved in an epidemic condition by implementing intelligent remote monitoring systems.

Another challenge identified in this study was associated with the tools and equipment used. Along with the spread of coronavirus beyond the existing capacities, hospitals were severely short of medical equipment (e.g., ventilator), personal protective equipment (e.g., face mask), and disinfectants, which reduced the quality of services. In a study by Karimi et al., the lack of support and equipment for caring for corona patients was identified as a serious concern with adverse effects on the quality of care (26). Furthermore, Ong et al. in Singapore suggested that during the pandemic, the lack of personal protective equipment was the most serious challenge, which was consistent with the results of the present study (27). This seems to have occurred because of the increased demand and the inability of the country's medical equipment industry to supply it.

In this study, it was indicated that the existing

ventilators and oxygen equipment were inadequate for patients and contributed to an increase in mortality rate among patients. In studies by Iyengar et al. and Maleki et al., ventilator inadequacy was reported to be a major problem in the treatment of corona patients worldwide, which was consistent with the results of the present study (28, 29).

Psychosomatic disorders were identified as challenges to the resilience of the quality of healthcare services in the present study. High workload, caring for critically ill patients, fear of developing the coronavirus disease, loss of colleagues and family members, and high mortality rate of patients all caused depression and burnout among the medical staff. In a study by Lai et al., the medical staff involved in the diagnosis, treatment, and care of COVID-19 patients were prone to psychological burdens (30).

One of the challenges identified in the present study was associated with medication shortages. During the initial stages of the COVID-19 pandemic, there was a shortage of particular medications, with some becoming scarce due to heightened demand and consumption. Studies by Uwizeyimana et al. in East Africa and Aljadeed et al. in Saudi Arabia showed that with the prevalence of the pandemic and an increase in the number of patients, hospitals faced several shortcomings in the supply chain of medicine and medical equipment. This finding was consistent with the results of the present study (31, 32). Sanctions and the country's economic problems in Iran appeared to have had a major impact on access to effective drugs.

Hospital management was identified as a challenge to resilience in the quality of health services. The unexpected conditions and unpreparedness to face the pandemic, as well as delayed decisions, led to poor management of the crisis. In a study by Jachetti in China, crisis management in hospitals was unpredictable and there was no planning to provide services to patients, which was consistent with the results of this study (33). During a crisis, it is important for key managers to be trained on maintaining quality services, and this training should include simulations to ensure service quality is upheld even in crises.

The nature of the disease was another challenge identified in the current study. The unknown nature of the disease, its high rate of transmission and prevalence, and the fear of developing the disease caused several psychological problems, such as panic, anxiety, depression, and physical problems. In studies by Jia et al. in China and Labbaf et al. in Iran, it was stated that during the pandemic, medical staff could not provide comprehensive support to patients (34, 35).

This study suggested that the coronavirus crisis in hospitals and the resulting problems led to less attention being paid to nosocomial infections during the pandemic. Consequently, the incidence of

nosocomial infections increased. Ong et al. and Khammarnia et al. showed that nosocomial infections were more common in COVID-19 and intensive care units (36, 37).

Another challenge identified in this study was associated with physical structures. Available facilities were not sufficient for the volume of hospital visits, and the long waiting queue of patients due to the shortage of hospital beds, particularly special beds, was one of the national problems in dealing with the coronavirus crisis. Research conducted by Plagg et al. in Italy and Rasouli et al. in Iran found that a rise in the patient load led to a shortage of hospital beds for those being admitted with COVID-19 (19, 38). Strengthening the ambulatory care system and establishing field tent hospitals in epidemic conditions can be an effective strategy to allocate beds fairly to people and provide access to services for patients.

According to the present study, physical space and human resources in most hospitals were insufficient to perform triage. Alhaidari showed that patient triage faced many structural, equipment, and human resource challenges (39). It seems that the management of infected patients can be better controlled by improving the physical space of triage in the hospitals.

5.1. Limitations

The present study had limitations in terms of its external validity, given the nature of its design (qualitative research). The results can be justified by the technical, social, and cultural infrastructure and cannot be generalized to different countries. Another limitation of this study was related to the specific conditions of the COVID-19 pandemic and the reluctance of hospital staff to share their experiences due to the sensitive nature of the epidemic.

6. Conclusion

The resilience of hospital service quality is an indicator of the governance of the Ministry of Health during the COVID-19 pandemic; however, the pandemic has significantly affected health systems around the world. This impact has been much greater in Iran due to severe economic sanctions and the weakness of the healthcare system, which has faced a shortage of health personnel, medical resources, and technology, and the existence of certain health inequalities. Despite government efforts to combat the pandemic, the interventions have not been successful. There are numerous challenges to the resilience of providing quality care in the hospitals studied. Therefore, policymakers must prepare hospitals for crises, including epidemics.

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Footnotes

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