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Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_1576_22

# A study of factors affecting the length of hospital stay (LOS) of COVID-19 patients: A qualitative evidence in Iranian hospital

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## Abstract:

**BACKGROUND:** The present study aimed to identify the administrators' and physicians' experiences and viewpoints about the factors affecting the length of stay (LOS) of COVID-19 patients and provide valid operational evidence.

**MATERIALS AND METHODS:** The current study was carried out qualitatively and phenomenologically on experts, officials, and administrators of hospitals in 2021. Purposeful sampling was performed with the maximum diversity. To achieve a comprehensive view, snowball sampling was conducted. Twenty-one experts in the field of healthcare and emerging diseases participated in this study. Semi-structured interviews were used to collect the data. The study sites were universities of medical sciences and hospitals of the Ministry of Health of Iran. The interview questions included questions about the factors affecting the LOS and strategies for controlling the LOS of COVID-19 patients in infectious units. Text analysis was performed through the content analysis method in MAXQDA-10 software.

**RESULTS:** Based on the experts' viewpoints, several factors affected the LOS in COVID-19 patients. These factors were divided into five clinical, preclinical, economic, social, and management subcategories. The proposed solutions included policy solutions (supportive policies, development of home care services, training and culture building, and establishment of clinical guidelines) and operational solutions (drug management, promotion of equipment and facilities, telehealth or telemedicine services, and promotion of clinical and support processes).

**CONCLUSION:** One of the main tasks of hospital administrators is identifying the factors affecting the reduction of LOS. Among these factors, clinical and management factors in the hospital are more important and need more planning and attention by hospital officials.

## Keywords:

COVID-19, hospital services, length of stay, physicians

## Introduction

Due to the lack of information on controlling the COVID-19, healthcare systems were overwhelmed by the drastic increase in patients seeking medical care.<sup>[1,2]</sup> For healthcare system implications, many doctors, nurses, and hospital beds are required to treat patients with the

confirmed disease, leading to overburdened hospitals and overtaxed medical resources worldwide. Furthermore, the median length of stay (LOS) among COVID-19 survivors was 10–13 days.<sup>[3]</sup> It can affect hospital costs.

Healthcare costs have risen sharply in recent years. Hospitals account for a large part of the health budget.<sup>[4]</sup> Nowadays, hospitals

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**How to cite this article:** Zaboli R, Bahadori M, Jafari H, Mousavi SM, Bahariniya S, Mehdizadeh P, *et al.* A study of factors affecting the length of hospital stay (LOS) of COVID-19 patients: A qualitative evidence in Iranian hospital. *J Edu Health Promot* 2023;12:403.

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Received: 02-11-2022  
Accepted: 25-12-2022  
Published: 27-11-2023

require adopting particular strategies to meet the needs and expectations of the external environment.<sup>[5]</sup> Much attention has been paid to the issue of costs and efficient use of resources in hospitals. Healthcare organizations have been forced to adopt strategies to reduce resource use while maintaining the quality of services.<sup>[6]</sup> Focusing on optimizing the patients' LOS is one of the ways to manage hospital beds and subsequently reduce hospital costs.<sup>[7-9]</sup> The average LOS of hospitalized patients is one of the main indicators in evaluating hospitals' performance. This indicator, along with the bed occupancy and bed rotation, is one of the most important indicators in determining hospital performance.<sup>[10-12]</sup> Thus, it is helpful to investigate the LOS of patients and the factors affecting it in hospitalization units for management, especially in determining priorities and improving services and proper allocation of resources. Several studies have proven that extensive clinical and non-clinical factors affect the patients' LOS. Identifying these factors is necessary for the optimal allocation of hospital beds, especially intensive care unit beds in emergency conditions.<sup>[13]</sup>

The prevalence of COVID-19 has been one of the unpredictable conditions that showed the need to optimize hospital beds and manage patients' LOS. Owing to severe lung damage caused by infection, the mortality rate in the patients and the need for artificial respiration have been very high.<sup>[14]</sup> There is no specific antiviral drug to treat the disease, and the main solution is providing supportive care, such as maintaining vital signs, regulating oxygen and blood pressure, and reducing complications, such as secondary infections or body organs' failure.<sup>[15]</sup> Given the high prevalence of the disease and the necessity to have an intensive care bed with artificial respiration in patients with severe conditions, reducing the LOS of these patients to cover patients with acute conditions is crucial and should be considered in hospital management.<sup>[16]</sup>

Estimation of LOS can be obtained from different studies, but only a statistical summary is often reported instead of the initial result of the study. The factors affecting the LOS of patients are also different. Many studies have been conducted on epidemiological and clinical characteristics, such as the COVID-19 patients' LOS.<sup>[17-20]</sup> Guo *et al.*<sup>[3]</sup> quantitatively found that female gender and having a fever on admission were significantly associated with longer LOS. Çetin *et al.*<sup>[21]</sup> showed that ICU survivors have longer LOS than ICU non-survivors. Moreover, increased CRP level, decreased HGB level, and calcium level are associated with longer LOS, independent of the contribution of surviving status.

It can be stated that the lack of qualitative evidence at the national and international levels is considered

a potential advantage of this study. Investigating the LOS of patients and the factors affecting it in COVID-19 patients can be effective in predicting and optimizing the policy of intensive care beds and possible conditions in the prevalence of other infectious diseases or emerging diseases. Considering that previous studies have not focused on unmeasurable factors identified through qualitative research and have only conducted quantitative studies. Therefore, the present study is innovative. The present study aimed to identify the experiences and views of managers and physicians about the factors affecting the reduction of COVID-19 patients' LOS. The study also aimed to provide valid operational evidence for risk classification and improve hospital performance in all dimensions to reduce the LOS of patients and improve the hospital's financial flow and liquidity.

## Materials and Method

### Study design and setting

The present phenomenological qualitative study was conducted in the summer of 2021. The study's statistical population included informed experts and hospital authorities, physicians, administrators, and heads of hospitals. The study sites were universities of medical sciences and hospitals of the Ministry of Health of Iran.

### Study population and sampling

In the present study, purposeful sampling was performed with the maximum diversity and to achieve a comprehensive view. Snowball sampling was used among the selected members of the research population. Sampling continued until the data were saturated with 21 interviewees. Table 1 presents the details of the participants' characteristics. The first two in-depth interviews were conducted to develop the interview guideline in the present study. Then, two other interviews were conducted as a pilot to ensure that all the obtained information was related to the research topic

**Table 1: Demographic characteristics of the interviewees**

Variable	Subset	Percentage/frequency
Gender	Man	13 (61.90)
	Female	8 (38.09)
Activity	Faculty member	5 (23.80)
	Hospital head and director	6 (28.57)
	Executive administrator	4 (19.04)
	Treatment history	6 (28.57)
Degree	Professional PHD	13 (61.90)
	Specialized PhD	6 (28.57)
	Master	2 (9.52)
Education	Physician	13 (61.90)
	Health services management	4 (19.04)
	Other	4 (19.04)

using this interview. Finally, semi-structured interviews were used to collect the data.

At the beginning of the interview, informed written consent was obtained from all the participants. The participants were also assured that their information and answers would remain confidential to the researcher, and they could withdraw from the study at any time. Interview questions included the factors affecting the LOS (clinical, preclinical, socio-economic, and management) and strategies to control the LOS of COVID-19 patients in infectious units.

The managers' opinions were used due to their power to formulate, design, and implement strategies to reduce the patients' LOS to reduce costs and increase hospital revenues. To increase the validity of the study results, the opinions of other groups directly involved in the treatment process were used. It should be noted that all the principles of medical ethics have been observed with the written consent of the interviewees.

### Data collection and analysis

All interviews were conducted in a face-to-face manner or by using Skype software. The interviews lasted 45-55 minutes and were implemented immediately after each recording. In this study, the content analysis method was used to analyze the texts in MAXQDA-10 software. Thematic descriptive analysis was used to identify essential and coherent themes about the factors affecting the COVID-19 patients' LOS in infectious units and its control strategies. In general, an inductive approach was used in this study, indicating that the findings were generated from the data instead of imposing predetermined structures for analysis. The analysis began with listening and reading the full text of the interview.

The framework analysis was used to analyze the data. Interview familiarization, developing a working analytical framework, indexing, charting, and interpreting the data was done.

### Ethical consideration

Ethical approval for this study was obtained from the Ethics Committee on July 27, 2022 (IR.BMSU.REC.1399.281).

## Results

Table 2 represents the results of examining the factors affecting the COVID-19 patients' LOS in infectious units. This table shows the two main concepts derived from the results of the qualitative study section as a framework for describing the current situation. Based on the research results, each concept included several

subcategories indicating different aspects of the concept. In total, 6 subcategories and 25 codes or factors were used to analyze the interview.

### Factors affecting the LOS

Based on the experts' viewpoints, several factors affect the COVID-19 patients' LOS in infectious units of the hospital. They were divided into five subcategories, including clinical, preclinical, economic, social, and management factors.

#### Clinical factors

Clinical factors are among the most influential factors in the COVID-19 patients' LOS in infectious units. In this regard, the interviewees believed that the patient's physical condition is very influential in the progression of the disease. Concomitant and underlying diseases of each patient also increase the patients' LOS. The activities of the treatment team and the behavior of the care team based on the unit guidelines have a significant impact on the LOS of patients. The physician's attitude in using the treatment methods or the patient's discharge time affects the patients' LOS.

#### Preclinical factors

Experts referred to age, gender, and level of education as preclinical factors affecting the patients' LOS. By increasing the age of each person, the possibility of developing various diseases increases, and the level of resistance of these people against diseases decreases. Thus, comorbidities and underlying diseases in each person due to old age directly impact the complexity of treatment and increase LOS. The experts believed that the level of education and the level of knowledge and general information about COVID-19 disease in each person, in addition to having a direct impact on the adhering to health guidelines, affect the level of attention to their symptoms and faster referral to medical centers, resulting in speeding up treatment and reducing their LOS. The interviewees stated that although there is no difference in the number of patients in terms of gender, the rate of adhering to health guidelines is higher in females. In case of the disease symptoms, females refer to medical centers faster than males.

#### Socio-economic factors

Based on the experts' viewpoints, although several social and cultural factors affect the COVID-19 patients' LOS in infectious units, the effects of economic factors, such as income and job status, are more significant than other factors. Based on the interviewees, the job and social status of people and generally their household income can affect their lifestyle since people with higher incomes can better follow health guidelines, such as quarantines, and they are less exposed to the disease, in addition to better nutrition and better living conditions. Moreover,

**Table 2: Main concepts and related codes in the qualitative analysis**

Quotation	Code/factor	Subcategory	Main concepts/category	
Factors affecting the LOS	Clinical	Treatment team	The general condition of each patient, underlying diseases, and comorbidities, such as diabetes and obesity, have a significant impact on the LOS (Respondent 11)	
		Unit therapeutic guidelines	"I think it is crucial to monitor and measure the indicators related to the patient's condition, such as the indicators for monitoring the patient's vital signs and prescribing the drug, i.e., injecting the right drug at the right time" (Respondent 3)	
		Clinical nutrition	"I think one of the influential factors in this regard is the existence of clinical guidelines. We can look at this issue from several angles: first, whether there is a proper clinical guideline based on systematic science and evidence, and second, the level of adhering to clinical guidelines. In this regard, the necessary training should be given to physicians, and these clinical guidelines should be regularly updated based on the latest scientific evidence. Accordingly, mechanisms should be provided to establish these guidelines in hospitals and medical centers. It means that if adherence to clinical guidelines decreases, the LOS increases" (Respondent 19)	
		Time of determining the patient's condition in emergency	"Clinical nutrition issues are also crucial. A proper nutrition program can affect patient recovery and care. Nutrition has two aspects." (Participant 4)	
		Comorbidities and underlying diseases	"Health literacy (necessary knowledge about the disease) in each person makes them aware of the disease and its symptoms and can distinguish it from other similar diseases. Therefore, they know when and what symptoms they need to refer to the hospital. Thus, one of the factors that can affect the LOS is the level of education and health literacy of people" (Respondent 14)	
		Referral time	"The patient's age affects the LOS, and older people are more likely to be overwhelmed by the disease and thus spend more time in the hospital" (Respondent 6)	
	Preclinical		Age	"It can be stated that females care more about their health and go to the hospital when the smallest issues put their health at risk. However, males are less sensitive and refer to the hospital later" (Respondent 20)
			Gender	"One of the most important issues is the factors related to one's job and social status in the society. For example, people belonging to the working class or the lower classes of society neglect their health during the epidemic and continue to work to earn a living because they have to spend considerable time in their daily lives." (Respondent 2)
			Level of education	"I think people interactions and social networks are other factors involved. If any person is in contact with people who do not pay much attention to their disease or act poorly in self-care behaviors, their norms and behaviors are affected accordingly, making treatment more difficult and increasing the LOS." (Respondent 16)
	Socio-economic		Job status	"In economic conditions, it can be stated that richer people have more sensitivity and even more accessibility." (Respondent 13)
			Income	"Living in crowded places or working in environments, where it is not possible to follow the protocols due to working conditions or the level of compliance is very low and also the lack of care facilities, such as masks by the employer, can complicate the disease and prolong the treatment process" (Respondent 8)
			Culture	"Access to facilities and equipment in the hospital is an important factor. One of the main needs of the COVID-19 patients, especially inflammatory patients, is the presence of oxygen and adequate access to the oxygen supply system." (Respondent 1)
Social interactions			"Hospital bed management mechanisms: Hospitals have a limited capacity and cannot accommodate all patients, so this issue should be considered, and a mechanism should be defined to provide outpatient services for people who do not need hospital care. Thus, management must decide on the mechanism of providing services" (Respondent 5)	
Management		Administrative processes	"When the patient's drugs are available in the pharmacy, it greatly reduces the LOS. However, when these drugs and equipment are not available, due to waste of time to prepare them and deliver them to the hospital, the LOS increases" (Respondent 21)	
		Supply of equipment and drug		
		Supervising		
		Bed management		
		Development of home care services		

Contd...



Table 2: Contd...

Quotation	Code/factor	Subcategory	Main concepts/category
Solutions to reduce LOS	policy	Supportive policies Development of home care services Training and culture building Establishment of clinical guidelines	"If a person's disease is covered by insurance, at least lack of income will not cause the person to refer to the hospital later. However, if they are not covered by insurance or covered incompletely, the person may use self-care or poor treatment methods, and this may complicate the disease and increase the length of his stay" (Respondent 17) "One of the key strategies is to establish clinical guidelines related to the management of COVID-19 disease based on systematic evidence and based on world experience" (Respondent 7) "Preventive policies and government support in meeting the basic needs of the people in times of crisis are important because if people are not forced to continue to work in times of crisis, they are less likely to get sick, and their illness does not get worse." (Respondent 18)

people with better income levels refer to hospitals faster after symptoms. The experts also believed that the culture of each family and their social interactions affect the level of adhering to health guidelines since people with less adherence to health guidelines interact more with those who are less sensitive to adhering to health protocols so that disease will overcome them sooner.

### Management factors

Hospitals are the main and key units in the country's health system and play a key role in providing healthcare services in the face of epidemics and crises. In the current outbreak, the service provision policies in each hospital and the management decisions of each insignificant have a great impact on the treatment of patients and LOS. The experts believe that hospital administrative processes, such as supervising the admission and discharge process, bed management mechanisms and visit management during an epidemic, supervising physicians, and providing medicine and equipment, are among the management factors affecting the COVID-19 patients' LOS in infectious units.

### Solutions to reduce the LOS

In answering the question of the ways to reduce the COVID-19 patients' LOS in infectious units, the participants emphasized that the solutions fall into two categories [Table 3]. The first category is policy solutions that should be planned at higher levels of the healthcare system and presented to lower levels, such as universities and hospitals. The second category is operational solutions that health sector executive administrators should commit to.

### Policy Solutions

Different countries have different policies regarding the disease. The correct and timely actions of officials can play a crucial role in controlling the disease and providing financial and moral support. This support includes covering treatment costs, financial support for poor people, providing psychotherapy and counseling for them, increasing the level of adhering to health guidelines, and observing the basic principles in the

event of epidemics, leading to a decrease in the number of patients and the length of the treatment process. Healthcare system officials can also prevent possible medical errors by establishing clinical guidelines based on updated scientific evidence from the world. Moreover, it is possible to avoid the risk of the disease and crowded medical centers and increase the LOS by educating and creating a culture on the symptoms and conditions of the disease and its treatment the society. Suppose home care services are developed, and the government covers this program in terms of financial issues and facilities. In that case, many patients will complete their treatment at home, and their LOS in the hospital will decrease.

### Operational solutions

Increasing the LOS and failure to determine the patients' conditions in a timely manner impacts hospital congestion and patients' dissatisfaction. Based on the experts' opinions, the COVID-19 patients' LOS in the infectious units of the hospital can be controlled by implementing various strategies. For example, drug management and supply chain planning affect care management, treatment process, and LOS. Improving the equipment and facilities status and attracting support from various organizations and individuals are other operational strategies to control the LOS of patients. Providing telehealth or telemedicine services can also affect patients' non-hospitalization and receiving treatment at home. Establishing quality improvement approaches to improve clinical and support processes and administrative and executive processes is another solution mentioned by the experts.

## Discussion

The experts believe that clinical factors are one of the most critical factors in reducing the patients' LOS. These factors include providing services by the treatment team, treatment guidelines, clinical nutrition, time of determining the patient's condition after referring to the emergency room, comorbidities, and underlying diseases, and time of patient's referral to the hospital. It has been proposed that the type of treatment significantly

**Table 3: Comparative analysis of the proposed strategies**

	The proposed strategies	Comparison with similar studies
Suggestions for reducing the LOS	<p>Development and improvement of clinical guidelines to reduce the LOS of hospitalized patients.</p> <p>Reviewing the training instructions of medical personnel to establish practical and operational training packages.</p> <p>Providing and allocating the required financial resources and sufficient budget at the macro-level of the health system to implement policies and programs to reduce the LOS of hospitalized patients.</p> <p>Developing effective policy programs within the framework of the policy package to reduce the LOS of patients at the macro-level of the health system.</p>	<p>The study by Qaseem <i>et al.</i> (2021)<sup>[22]</sup> and Chen <i>et al.</i> (2021)<sup>[23]</sup> also point to the need to pay attention to the development of clinical guidelines as a critical factor.</p> <p>Hosseini-Shokouh <i>et al.</i> (2019)<sup>[24]</sup> studied organizational factors affecting the LOS of the patient, including the ratio of nurse to patient, physician and trained nurse, patient discharge process, physician presence in the ward, number of preclinical requests, interdepartmental coordination, first-time treatment in the ward after the patient's arrival, time of visit, and admission days.</p> <p>A study by Verma <i>et al.</i> (2021)<sup>[25]</sup> suggested that systems, processes, resources, and skills should all be balanced to reduce congestion and LOS.</p> <p>The study of Vekaria <i>et al.</i> (2021)<sup>[26]</sup> points to the need to develop comprehensive policy plans to reduce the LOS of patients.</p>

reduces the LOS.<sup>[27]</sup> Wu *et al.*<sup>[28]</sup> indicated that the type of prescription drug could effectively reduce mortality and COVID-19 patients' LOS. Among the clinical factors, underlying diseases significantly impact the infection of COVID-19 patients and thus increase the significant growing of their LOS. Santos *et al.*<sup>[29]</sup> stated that rheumatic patients experience a severe form of COVID-19 due to their immunodeficiency status and therefore are hospitalized for longer. Alkundi *et al.*<sup>[30]</sup> found that patients with diabetes hospitalized due to COVID-19 had higher LOS than patients without diabetes. Al Nhdi *et al.*<sup>[31]</sup> concluded that increasing patients' waiting time in the emergency department could increase their LOS. In another study, Mousavi *et al.*<sup>[32]</sup> concluded that demographic and epidemiological factors, dietary factors and diabetes, neurological conditions, liver damage, acute cardiovascular diseases, and social factors play a large role in the length of hospitalization of COVID-19 patients.

Preclinical factors are among other factors affecting the patients' LOS, including age, gender, and level of education. Jang *et al.*<sup>[33]</sup> conducted research to identify the factors determining medical costs and the COVID-19 patients' LOS in South Korea. They concluded that the elderly was hospitalized longer than the young people, and female patients in the age-group over 65 years had a longer LOS. Studies conducted by Delora *et al.*,<sup>[34]</sup> Aggarwal *et al.*,<sup>[35]</sup> and Mendes *et al.*<sup>[36]</sup> showed that age is associated with increased mortality and increasing the COVID-19 patients' LOS in hospital. Most elderly patients had longer LOS. The experts believed that economic and social factors could affect the patients' LOS. Some of these factors include job status, income, culture, and social interactions. In a study aimed to investigate the effect of race and socioeconomic status on the outcomes of patients hospitalized due to COVID-19, Quan *et al.*<sup>[37]</sup> concluded that income inequalities have a significant impact on increasing the

LOS of patients so that poorer black patients were at higher risk of death and the longer stay in the intensive care unit (ICU). In a retrospective cohort study, Vong *et al.*<sup>[38]</sup> investigated the association between obesity and COVID-19 mortality and length of stay in intensive care unit patients in Brazil and concluded that overweight older adults over 60 years of age. They are hospitalized for a longer period of time. Therefore, old age and obesity can be an effective factor in increasing the length of stay of patients in the hospital.

In a retrospective cohort study in the USA, Little *et al.*<sup>[39]</sup> conducted a study to examine the impact of socioeconomic status on the clinical consequences of COVID-19. They concluded that an unequal socioeconomic slope among the COVID-19 patients could affect their LOS. Management factors in the hospital were other factors affecting the reduction of patients' LOS. They include administrative processes, supply of equipment and drug, supervision, and management of beds. One of the most critical administrative processes is the patient's discharge process. Flexibility in the patient's discharge process or shortening this process can reduce the LOS of patients who remain in the hospital due to the difficult discharge process. Fazaeli *et al.*<sup>[40]</sup> reported that timely discharge from the hospital could affect the capacity of the hospital and the provision of high-quality services, and improvement of this process requires structural reforms and coordination among different units, individuals, and hospitals. Ragavan *et al.*<sup>[41]</sup> emphasized eliminating barriers to the timely discharge of patients in the hospital with planning, effective communication methods, more timely preparation, and standardization tools for the discharge process. Bouchlarhem *et al.*<sup>[42]</sup> in a retrospective study with the aim of determining the factors affecting the length of hospitalization of COVID-19 patients in the intensive care unit came to the conclusion that management factors and the way of monitoring the treatment process of patients such as the

proper use of mechanical ventilation play a large role in the duration. Patients have hospitalization periods. In this article, the researchers emphasized the importance of early consultation after the appearance of respiratory symptoms in patients hospitalized in the intensive care unit in order to reduce the length of hospitalization.

Pecoraro *et al.*<sup>[43]</sup> referred to the importance of providing hospital equipment and beds to better care for COVID-19 patients and reduce their LOS in hospitals. They also stated that one of the main challenges during the COVID-19 crisis is the rapid and efficient allocation of resources, such as medical professionals, equipment, and hospital beds, to cope with acute conditions. Moreover, analyzing hospital capacity before a crisis outbreak is essential for properly managing hospital beds. The policy strategies mentioned in the present study to reduce the patients' LOS included supportive policies, the development of home care services, training and culture, and the establishment of clinical guidelines. In a study conducted by Bryant *et al.*,<sup>[44]</sup> they referred to the importance of developing home care services to reduce the LOS of patients with non-acute conditions and cover patients with acute illnesses in the hospital. They also referred to providing safe and effective patient-centered care at home, management of increased demand for health care, planning for new clinical pathways for patient care, minimizing the impact of staff shortage, and minimizing the risk of COVID-19 disease exposure for staff and patients as the main goals of home care services.

Training and culture are other essential policy solutions to reduce the patients' LOS. Keeney reported that many hospitals lack the financial infrastructure needed to hire enough staff to meet the needs of the COVID-19 patients, such as training and counseling services. Hence, providing these services becomes increasingly complex, and especially patients hospitalized in the ICU require more services, which policy-makers should consider.<sup>[45]</sup> Training of medical staff also has particular importance. Cho *et al.*<sup>[46]</sup> concluded that the level of education of nurses and staff was significantly related to the LOS of patients in South Korean hospitals.

Drug management, promoting the equipment and facilities, telehealth or telemedicine services, and improving clinical processes were among the operational strategies proposed to reduce the LOS of patients. The studies conducted by Emerick *et al.*,<sup>[47]</sup> Contreras *et al.*,<sup>[48]</sup> and Farooqi *et al.*<sup>[49]</sup> referred to the special importance of telemedicine in the COVID-19 crisis and special the development of national guidelines and policies for the implementation of telemedicine for better management of hospital beds. Bowale *et al.*<sup>[50]</sup> concluded that treatment processes should be reviewed to improve the admission process, reduce hospital stays, and increase response to

COVID-19 in Nigeria. Andersen *et al.*<sup>[51]</sup> also concluded that preventing chronic and inappropriate prescription of drug items can reduce the severity of COVID-19 in hospitalized patients and even lead to their recovery and discharge from the hospital as soon as possible.<sup>[52]</sup>

It should be noted that reducing the patients' LOS does not indicate a lack of patient safety. Based on credible evidence, reducing the COVID-19 patients' LOS is a scientific issue. Reducing the LOS of patients should be based on valid clinical protocols, taking into account the opinions of specialists. This is only possible if the patient's clinical condition is stabilized, so the hospital only needs hotel services. If the patient needs less treatment, he should be returned home. Moreover, transferring patients with stable conditions to convents outside the treatment environment can cause hospital beds to be allocated to patients with poor conditions.

### The study's strengths and limitations

Due to the nature of qualitative studies, the findings could not be generalized to other populations. One of the most critical strengths of the study was the main research area surveyed from the target population. Given the importance of reducing the COVID-19 patients' LOS in the hospital and the positive psycho-socio-economic consequences for the hospital and the health system, conducting such a study in Iran seemed necessary. Also, there is not enough national and international evidence on this fundamental issue, and certainly, the occurrence of crises such as COVID-19 is not far from expectations in the world. Hence, health decision-makers can take more appropriate measures to increase an organization's resilience by identifying these factors and taking appropriate and effective steps. Another strong point of the study is the use of various stakeholders' opinions directly related to the subject of COVID-19, which increases the comprehensiveness of the evidence generated for decision-makers and largely solves a part of the problem decision-makers generalizability of qualitative studies. One of the 'study's main limitations was the lack of access to some specialists, physicians, administrators, and experts for interviews, which was reduced by taking measures.

### Conclusion

The length of stay of patients in the hospital is one of the most useful hospital indicators, it is widely used in hospitals, and it indicates the level of efficiency and performance of hospital activities. Reducing the length of stay of patients with COVID-19 to cover patients with acute respiratory conditions is very important. Knowing the factors affecting the reduction of the length of stay of patients in the hospital is one of the main duties of hospital managers. Among these, clinical and

management factors in the hospital are more important and require more planning and attention from managers and health policy makers. Also, it is very important to use strategies to reduce the length of stay of patients by hospital managers in order to deal with patients with acute corona conditions as much as possible.

### Acknowledgment

The present study is the result of a research project approved by Baqiyatallah University of Medical Sciences in Tehran. This qualitative study was the result of the collaboration of a large number of experts in different hospitals. We thank all the experts who participated in the study.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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