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The performance of primary health care in the management of the Covid-19 in Iran and the existing challenges and strategies on the way to confront the pandemics: A qualitative study

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Abstract:

BACKGROUND: Primary healthcare (PHC) in Iran, like in other countries, has a fundamental role in managing COVID-19 despite facing various challenges. Therefore, the aim of this study was to qualitatively analyze the performance of PHC in the management of COVID-19 and identify the existing challenges, as well as strategies.

MATERIALS AND METHOD: The data for this qualitative study with a conventional content analysis were collected through interviews. The participants of the study were PHC employees, managers, and experts who had high experience and knowledge in the field of the study. The participants of the study were selected using purposeful sampling. The data were analyzed manually using the Granhiem and Landman method.

RESULTS: PHC performance was divided into five main themes and 13 subthemes, including epidemic diagnosis, training, making changes to respond, care and vaccination, cooperation, and coordination. Six main themes and 19 subthemes were categorized as the challenges of dealing with COVID-19, which are inputs and structure, infectious disease control and management, management and policymaking, community support, education and evidence management, and providing care services. Strategies were categorized into four main and 16 subthemes. The main strategies were making preparations before the epidemic, reviewing at all levels of PHC, cooperation and coordination, and integrated information.

CONCLUSION: The results of this study can be used by authorities and policymakers to prepare well for possible future pandemics.

Keywords:

COVID-19, performance, primary healthcare

Introduction

In the recent past, it has been observed that there is an increasing burden of emerging infectious diseases globally and frequent occurrences of outbreaks.[1,2] During the COVID-19 pandemic, countries showed different reactions directly associated with their Health System (HS) infrastructure and structure, their available primary resources (financial and human resources), and the severity of the disease spread. Evidence reveals that most countries rely on their hospitals and treatment systems.

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However, in the Islamic Republic of Iran, the HS's response was slightly different.[3] Since the early days of identifying cases, the primary healthcare (PHC) system has initiated a comprehensive reaction to combat the COVID-19 pandemic as the first line and the first point of contact between the HS and the community.[3]

In global health policy, PHC is regarded as the cornerstone of healthcare and serves as the first point of contact.[4] People-centered PHC has to focus on the patients as well as the health of the whole community at a population health level.[5]

COVID-19 has not only affected the health of the population in many ways but also impacted the PHC access in countries around the world. PHC can play a significant role in the COVID-19 pandemic, by differentiating patients with respiratory symptoms from those with COVID-19, making an early diagnosis, helping vulnerable populations deal with their anxiety, and reducing the demand for hospital services.[6,7]

Considering that PHC plays an important role in the prevention of epidemics, but clarifying the main performance that PHC has performed in the management of COVID-19 is the main need and what problems PHC has faced in this regard. In this field, many quantitative studies have been conducted in Iran; however, to discover the challenges and problems and better manage future epidemics, qualitative studies will get better answers. This study aimed to illustrate how Iran's PHC performance has been and what are the challenges that existed so that appropriate solutions can be found.

Materials and Methods

This study used a qualitative design with a conventional content analysis. Conventional content analysis is one of the most important qualitative research techniques in social sciences, which analyzes data to understand them.[8] In this study, the researchers intended to qualitatively evaluate the performance of PHC in the management of the COVID-19 epidemic in Iran and identify the future challenges through an in-depth examination of the experiences of PHC providers, managers, and officials in this field in management of the COVID-19 epidemic. This study was conducted between May 2022 and June 2023 in Iran.

The research team and reflexivity

The two members of the research team were active faculty members (lecturer) and a research assistant (PhD student) at health management schools. Two of the researchers were educated in health management and one in health policy. They all have previous experience working in qualitative research.

Participants and sampling

Due to the pandemic situation and lack of access, some interviews were conducted in absentia through WhatsApp or audio contact. Interviews were continued until the data became repetitive and were concluded upon reaching data saturation.[9] The participants of this study include PHC employees who had a direct role in controlling the epidemic of COVID-19, managers and officials of PHC who had direct responsibility in this field, and other experts who had high experience and knowledge in the field of PHC performance and challenges in managing COVID-19. To select participants, a purposive sampling method was used. The purposive sampling technique is the deliberate choice of a participant due to the qualities the participant possesses. It is a nonrandom technique that does not need underlying theories or a set number of participants. Simply put, the researcher decides to find people who can and are willing to provide.[10] Inclusion criteria were as follows: (a) People who had at least 5 years of work experience and (b) people who have worked during COVID-19 and had experience. Exclusion criteria were as follows: (a) Lack of access to the desired person; (b) having any language, speech, or hearing impairments that would hinder communication; and (c) not agreeing to participate in the study.

Data collection

The semi-structured interview form was prepared by the researchers based on the relevant literature review, study objectives, and opinions of research team members. The form consists of two parts. The first part includes four questions about age, gender, total working experience, and experience as a manager; the second part includes a list of four open basic questions for use in semi-structured interviews [Additional file 1]. Two interviews were conducted to test the validity of semi-structured interview questions. After the clarity and comprehensibility of the interview questions were determined in the pilot test, the data form was applied to all people. The participants were interviewed individually by asking questions in a semi-structured interview form in person or in person. During the interviews, some questions were changed and were encouraged to respond with prompts such as "Could you elaborate a little more on your answer?" and "What are you doing?" What does it mean? All interviews were conducted by the same two researchers (S.H.E. and A.A.S.) and lasted an average of 45 minutes. In total, 15,541 minutes of audio were recorded. Ten of the interviews were conducted individually and in person at the health department and 25 of the interviews were conducted by phone. The interviews were recorded using an audio recorder and transcribed verbatim by the same two researchers. Collecting data and analyzing them were performed concurrently.

Data analysis

Data analysis was done by conventional content analysis method and in accordance with inductive method simultaneously with data collection by Granhiem and Landman[11] method as follows: Implementation of the whole interview immediately after each interview, reading the entire text for a general understanding of its content, determining meaning units and primary codes, classification of primary codes similar to the more comprehensive, and determining the main content of classes. Data analysis was done by using the theme classification table and manually in word 2013 software. Data analysis was done by authors S.H.E. and A.A.S. Since the study was based on an inductive approach, no categories were defined beforehand. Immediately after each interview, the interviews were transcribed verbatim. Then, to immerse in the data, the transcripts of the interviews were read several times. Each interview was analyzed before the next interview. The meaningful units extracted from the interviews were read and coded. Then the codes that had similar meanings were grouped into subsets. Collections were placed in a collection based on similarity, compatibility, fit, and relevance. Finally, the main themes were categorized.

Trustworthiness

The trustworthiness of the study was evaluated based on the four criteria specified by Lincoln and Guba (1985)[12]: (i) For credibility, the opinions of participants with different viewpoints were compared to ensure data source triangulation. The recordings were listened to multiple times to prolong engagement. Furthermore, the study was designed to include more than one researcher. As peer debriefing, two researchers (third and first) regularly discussed the codes and reached a consensus regarding the most appropriate codes, categories, and themes. (ii) The thick description method was used to ensure transferability. To this end, detailed explanations were obtained from the participants to fully understand them.

Ethics

This study was a part of a Ph.D. thesis approved by the Tabriz University of Medical Sciences (Number: IR.TBZMED.REC.1400.279). At the first of the interviews, the aim of the study was explained to all of the participants. The participants were able to stop cooperation at any moment of the research and participated completely voluntarily. Written consent for face-to-face interviews and verbal consent for telephone interviews were obtained at the beginning of the interview. Participants were also assured that their names would remain confidential.

Results

Thirty-five (35) health professionals and managers who were employed in various PHC sectors participated in the study. The characteristics of the study participants are given in Table 1.

Iranians' primary healthcare response to COVID-19

PHC performance was categorized in five main themes and 13 subthemes, which include (1) epidemic diagnosis, (2) training, (3) make changes to respond, (4) care and vaccination, and (5) cooperation and coordination.

1. Epidemic diagnosis

According to the study participants, the first step to managing an epidemic is to diagnose the epidemic. The PHC system can detect epidemics earlier due to the extent and coverage of the population.

1.1. Rapid diagnosis

According to the opinion of the participants, one of the effective components in controlling the epidemic is rapid diagnosis of the epidemic according to the syndromic symptoms can lead to the prevention and control of the disease.

> *"Healthcare workers play a role in the emergence of diseases and the detection of outbreaks. As a physician, my role is to suspect the disease, based on the definition given to me, I should be suspicious."*

1.2. Screening and identification affected people

Diagnosing and quickly identifying infected people helps to treat the patient faster and also prevents the transmission of the disease to other people.

> *"It is important that we can identify people who had potential contact with this person before and after the disease. In fact, carriers are people without symptoms who identify and separate the carriers in time."*

2. Training

According to the opinions of the participants, education is one of the main components for preparing before an epidemic occurs. Considering that training takes time, most of the participants stated that health managers and policy makers do not prioritize it in their goals,

Table 1: The characteristics of the study participants

Characteristic	No. of respondents (%) (*n*=37)
Age (*n*=37)	MEAN=50
Gender identity	
Male	24 (64%)
Female	13 (35%)
Total working experience (years)	MEAN=25
Experience as manager (years)	MEAN=14

n, number

considering that education gives late results. This theme was classified into two subthemes of training individuals and society and training personnel.

2.1. Education of individuals and society

According to the participants, educating people is one of the main components of infectious disease control, considering that it is cheap and easy.

"Training people is one of the principles of disease control and the main and important role of health is education and healthcare workers have the duty of educating the people and the population they cover."

2.2. Personnel training

The training of human resources should be before the epidemic, but in COVID-19, after the outbreak of the disease, we trained the health workers.

"We must prepare our forces for epidemics from now, before the epidemic. That means we have to get help from epidemiologists. Use people who know how to deal with diseases."

3. Make changes to respond

To respond to an epidemic like COVID-19, structural and process changes are needed to be able to manage the critical conditions of an epidemic.

3.1. Change in structure

In Iran's healthcare system, a series of changes occurred in the structures of the physical space of health centers, for example, selected centers for COVID-19.

"The first and most important intervention was the creation of selected centers for COVID-19, that is..., which means that no special service is provided."

3.2. Change in the programs and methods

For the care and quarantine of the infected, the healthcare package was reviewed and most of them were done remotely.

"We... decided to review the health packages to see which services or part of the services can be provided remotely or which part of the services must be provided in person."

4. Care and vaccination

According to the opinion of most of the participants, in epidemics, in addition to routine care, infected people should also be taken care of. This theme was divided into four subthemes.

4.1. Providing basic care

Routine care, including care for pregnant mothers, children, and infants, the elderly, and communicable diseases, should be planned and provided during epidemics.

"In addition to caring for patients with COVID-19, we should have been able to provide routine care, although the provision of other services was slightly reduced."

4.2. Care of sick people

The biggest workload of healthcare workers was to take care of sick people to recover in the mild stages of the disease.

"Taking care of infected people was our main job. If someone tested positive, we would train them and follow-up the person's general condition for 2 weeks."

4.3. Follow-up

The follow-up of infected people and their relatives was one of the most important tasks of healthcare workers so that people can stay in quarantine and rest to recover faster.

"Healthcare workers can help with the need for more follow-ups. They call people dozens of times to satisfy them. Patients are followed up until the last moment of receiving the service."

4.4. Immunization by vaccination

Vaccination needs training and emphasis from the ministries of health and caregivers so that people volunteer to inject it and collective safety is created.

"Vaccination, mask training, sometimes the government instead of going to sleep in the ICU, it would be better for him if he gave free masks..."

5. Cooperation and coordination

According to the participants, to be able to resist the epidemic, there must be cooperation and coordination within the organization. On the other hand, quick action against epidemics also depends on the coordination of the system.

5.1. Intrasectoral cooperation (within the health system)

The coordination of people and groups within the department can help to facilitate the work and make it one direction.

"Coordination and guidance of activities within the health system should be seen in epidemics."

5.2. External cooperation with other departments (outside the health system)

This coordinated system must have a good cooperation relationship with other organizations to be responsible for the correct management of epidemics.

"Other organizations should determine their role in the management of the epidemic, so that now the municipality and other departments have a role in health and health, but when do they want to play their role?"

5.3. Attracting public participation

The most important point in this title is to attract people's participation to prevent further spread of the disease faster with the cooperation of people in following the instructions.

"We have people's participation in the principles of PHC, and we must use people's participation in prevention and health activities. In epidemics, if we cannot attract people's participation, we will fail."

Challenges in PHC in response to the COVID-19 epidemic

Six main themes and 19 subthemes were categorized from the concepts related to the challenges of dealing with COVID-19, which are inputs and structure, infectious disease control and management, management and policymaking, community support, education and evidence management, and providing care services [Table 2].

The first challenge includes the subthemes of improper structure, insufficient equipment, lack of financing, improper data management, and insufficient force. The first challenge includes the subthemes of improper structure, insufficient equipment, lack of financing, improper data management, and insufficient force. The structure of the PHC needs to be revised according to the changes in the type of diseases and the care needs of the people. Personal protective equipment there was not enough at the beginning of the disease and it was difficult to prevent the disease. Financially, it faced problems such as increasing care but no change in the budget of the health system, and numerous data software, lack of integration of information caused confusion in decisions and actions. The manpower was trained for normal times and was not responsible for increasing service delivery during the COVID-19 crisis.

The challenge of managing infectious diseases was classified into two subthemes of unknown disease and lack of attention to infectious diseases. COVID-19 was unknown to PHC and the health workers had not received the necessary training about the disease on the other hand, in recent years, due to the lack of epidemics, the focus was on noncommunicable diseases such as blood pressure and cancers, and the system was not prepared to control the epidemic.

The third challenge is inappropriate management and policy-making, which was classified into three subthemes: poor management, ineffective policymaking, interdepartmental cooperation, and weak departmental performance. Disease management processes were not defined in advance and the health system was not prepared to respond and manage the epidemic. Policy making was not done due to the lack of timely, correct, and integrated evidence-based information.

The fourth challenge was community support, which was classified into two subthemes of inappropriate attitude toward PHC and cultural barriers. In the context of society's pessimism and lack of trust in health, people only go to medical centers, and this causes the disease to become more severe and the work of hospitals to increase. From a cultural point of view, there was denial of disease and people's customs and nonacceptance of compliance with protocols.

The fifth challenge was evidence-based training and management, which was classified into three subthemes of ineffective training, weak supervision, and instability of guidelines. Education is a long-term process and is not effective in a short period of time, and since education started after the epidemic, there was not enough time to influence people's behavior. Monitoring was also not accompanied by providing a solution, and the location and facilities of each health center were not paid attention to. The existing guidelines and protocols changed over time, causing confusion and nonacceptance of people.

The last challenge was about service delivery, which was classified into four subthemes: stoppage in basic services, resistance to immunization, lack of preparation, and delay in diagnosis. With the spread of COVID-19 and the increase in the duties of healthcare workers, some basic services such as pregnant mother care, newborn care, and noncommunicable disease care decreased. At the beginning of the disease, there was resistance to vaccination due to rumors among the people, which multiplied the justification tasks for health workers. There was no necessary preparation to provide remote services, and people and healthcare workers were not trained to use modern technologies. The lack of incomplete PHC coverage in the outskirts of the cities and the spread of the disease by individuals had caused

Table 2: Challenges in PHC in response to the COVID-19 epidemic

Theme	Subtheme	Number of codes	Quotation
1. Inputs and structure	1.1. Inappropriate Infrastructure	7	*"There are no electronic infrastructures in many health centers and houses, including high-speed Internet, etc."*
	1.2. Insufficient equipment	5	*"At first, we were stressed to have a filter mask, to have a shield. At first, we were stressed, we didn't feel safe, we found the factory, there was no office, so we were surprised."*
	1.3. Weak funding forecast	4	*"lack of credit, you have a system that has multiplied due to the outbreak of rain disease, the need for manpower, equipment, and working hours has increased."*
	1.4. Weakness in data management	3	*"We had a disaster in the registration of statistics and we could not manage.how to summarize all this data quickly"*
	1.5. Insufficient manpower	8	*"If you are not able to provide the strength, they will suffer from job burnout and mental crisis, they will suffer from frequent physical ailments."*
2. Infectious disease control and management	3.1. Unknown disease	5	*"We had a lack of planning in Corona, just like the discussion of EOP, the discussion of crises, which we want to investigate, for example, in accidents, unfortunately, in every crisis that occurs, earthquakes and floods, we do not use the past experiences well."*
	3.2. Focus on noncommunicable diseases	2	*"Even several years ago, they used to work on blood pressure and mental diseases, they used to work on noncommunicable diseases and diabetes, now Corona has become a push for the Ministry of Health to know that epidemics of communicable diseases can also happen, newly emerging and re-emerging diseases can happen."*
3. Management and policymaking	4.1. Weak management	4	*"We do not have a long-term strategic plan, an alternative plan, a long-term strategic plan, a support plan, and if we face a situation, we will have a crisis again. New crises create new situations, such as Congo fever, Zika, etc."*
	4.2. Weakness in policy making	9	*"But there are some programs whose priorities are not clear until they happen, maybe they are hidden in a corner and are not on the agenda."*
	4.3. Weakness in inter-departmental and outsourcing cooperation	4	*"The Ministry of Health was left alone in providing services, there was a lot of noise on the surface, but in the heart of the work, it was alone. In 3 or 4 months, there was intersectoral cooperation, but most of the time, the Ministry of Health was left alone, something that we did not see in other countries."*
4. Community support	5.1. Inappropriate attitude to PHC	6	*"According to the people, the biggest role is in the hospital because they are in the worst conditions and the one that people prefer to go to is the hospital and the private sector."*
	5.2. Cultural barriers	5	*"At first, people denied it, they were cautious, they did not say that I ate ice cream yesterday, I became like this, to prevent this from happening, it is better than infecting 10 people".*
5. Education and evidence management	6.1. Ineffective training	4	*"Regarding education, I think that in many places, we have abandoned popular education and people's sensitivity is disappearing."*
	6.2. Inadequate supervision	3	*"Every day, one instruction only increased our stress, they only told us to do something new, in the coronavirus situation, all the instructions were different."*
	6.3. Instability of instructions	4	*"... How does the tourism heritage organization allow people from the red cities to go to Armenia and return? Lack of monitoring of border traffic and tourists"*
6. Providing care services	7.1. Interruption in essential services	6	*"Professors and deputy health officials said to leave everything aside and only provide services for COVID-19, while we should also provide care in addition to the crisis."*
	7.2. Lack of vaccination culture	5	*"We vaccinated 200 people. It is one word, but how we justified it was a difficult task. …, which means you go to the door of people's houses. At first, he does not open the door"*
	7.3. Lack of preparation to face the disease	3	*"After the arrival of COVID-19, people have a fear of going to the healthcare centers. On the other hand, 90% of the colleagues are depressed. The moral of the work is lost when they are not supported in terms of overtime."*
	7.4. Delay in diagnosis	6	*"First of all, primary healthcare can identify the patient first. What happened was that the disease was diagnosed in the hospital, even in the worst conditions, and after the death of the patient."*

a delay in the identification of infected people and the failure to break the disease chain.

Strategies to combat with the existing challenges in managing the pandemic

Study participants provided suggestions for improving PHC performance in managing infectious disease epidemics. The mentioned cases were categorized into four categories that were making preparations before the epidemic, review at all levels of PHC, cooperation and coordination, and integrated information, which include 16 subthemes [Table 3].

Among the four solutions obtained, the first solution is to prepare before the outbreak of an epidemic. This preparation is classified into six subtopics, which include continuous training (i.e., training takes time and gives results over time and causes a change in the behavior of the individual), provision of trained human resources that are suitable for the needs of an epidemic, provision and stockpiling of personal protective equipment is for faster response to epidemic crisis, formation of response teams, and continuous training for better preparation, providing predictable budget for epidemic crisis and focusing on prevention such as using guidelines to prevent disease transmission in epidemics.

The second theme is about revising the system, which includes five subthemes, which include changes in its structure, such as physical space, isolation rooms, proper ventilation, or conditions suitable for epidemics of infectious diseases. The way of providing services in epidemics should be remote, also the service package should be prioritized and revised in terms of the necessity

Table 3: Strategies to combat the existing challenges in managing the pandemic of infectious diseases in Iran

Theme	Subtheme	Number of codes	Quotation
1. Making preparations before the epidemic	1.1. Continuous training	5	*"We must prepare our forces for epidemics from now, before the epidemic. That means we have to get help from epidemiologists. …"*
	1.2. Supply Human Resources	6	*"Behvarz or healthcare workers in the first line and the next step are healthcare workers in health centers and bases. This human force must be provided, trained, protected, and supported."*
	1.3. Supply of equipment	4	*"We cannot store all the equipment in large quantities, but we must store some essential protective equipment, for example, in the case of COVID-19, masks were not found at the beginning of the disease."*
	1.4. Providing sustainable financial resources	3	*"…stable sources should be defined in this COVID-19 pandemic, the resources either remained constant or decreased in most cases."*
	1.5. Formation of response teams	3	*"Response teams should be formed in advance for quick response and be periodically trained throughout the year so that we are not delayed in the event of an epidemic..."*
	1.6. Focus on prevention	5	*"In the epidemic, we should focus on the prevention methods, that is, instead of buying masks, we should give people expensive scanning devices, the prevention methods are low-cost..."*
2. Review at all levels of PHC	2.1. Revision of PHC structure and function	4	*"… We have to write plans to deal with the epidemic, it must be prioritized and its priority should be determined to deal with the crisis."*
	2.2. Revision of service delivery and service package	5	*"The number of services provided in the first level should be updated and we should update them to be provided in pandemics."*
	2.3. Strengthening the surveillance system	3	*"Nurses and healthcare workers play a role in the emergence of diseases and in the detection of outbreaks…. based on the definition given to me, I should be suspicious."*
	2.4. Elaboration of policy package	5	*"In an epidemic, everyone is involved, the whole society is involved in an epidemic, we can design protocols for all jobs and different levels of age groups, such as schools, offices, etc."*
	2.5. Using the experiences of COVID-19	2	*"After the COVID-19 pandemic, some lessons were learned. We found out where the weak points of the system are…What should we do for weaknesses?"*
3. Cooperation and coordination	3.1. Internal coordination	4	*"Coordination and guidance of activities within the health system should be seen in epidemics."*
	3.2. Outsourcing coordination	4	*"Other organizations should determine their role in the management of the epidemic so that now the municipality and other departments have a role in health"*
	3.3. Attracting people's participation	3	*"We have people's participation in the principles of PHC…In epidemics, if we cannot attract people's participation, we will fail."*
4. Integrated information	4.1. Integrated statistical system	5	*"In the PHC system, rapid diagnosis can be done, provided that we have up-to-date information."*
	4.2. Use of technology	3	*"In an epidemic, we have to use new technologies, for example, providing remote services (telemedicine) or remote training, we must be ready to use these technologies..."*

of being present and not to reduce the transmission of the disease. The surveillance and monitoring system also needs to be strengthened and revised to respond to epidemics has it. For this review and reforms, it is very effective to use the experiences of previous epidemics.

The third theme is interdepartmental and outsourcing cooperation, which refers to three categories of interdepartmental cooperation, that is, coordination within organizations, to establish unity of command in performance, and to prevent acting in isolation, outsourcing cooperation requires the cooperation of all organizations in the country. It is in an epidemic crisis and people's participation in decision-making and law enforcement is one of the basic principles in crisis control.

The fourth theme is integrated information and includes two subthemes of integrated statistical information for better data management in decision-making and policy-making. It is correct to use new technologies such as telehealth to prevent the spread of disease.

Discussion

This study was conducted with the aim of investigating the measures taken by PHC during the COVID-19 pandemic and the challenges in this direction. Healthcare workers have carried out measures such as identifying infected people through screening, training people, vaccination and caring for infected people, and other routine care and following up on the patient's surroundings and reporting information to different levels of PHC, and in this regard, they are facing challenges such as lack of necessary infrastructure, frequent changes in protocols, lack of effective training, and the PHC system being alone during COVID-19, as well as the lack of personal protective equipment, including masks, were faced.

The management of mild cases of the disease can be done by PHC. In the present study, most people recovered in this way and only in severe cases were referred to hospitals, otherwise the workload of hospitals increases. A study showed that at the beginning of the COVID-19 epidemic, all the care was managed at the hospital level and with hospital beds, but it quickly became clear that these cares were insufficient against the epidemic.[13] Recent studies state that the roles of PHC should be clear and transparent to be able to respond to a widespread epidemic like COVID-19.[14,15] Considering that most of the cases are mild, there is a possibility that the workload of the hospitals will be reduced with the outpatient treatment of mild cases.

In this study, education was mentioned as one of the important actions of healthcare workers. Since the beginning of the epidemic, healthcare workers taught the population under their care about the disease, how it is transmitted, and methods of preventing it. Studies showed that with the spread of the epidemic, the role of education at the PHC level has increased, and the most important activity of healthcare workers has been teaching people how to prevent infection.[16,17] Planning and implementing training before an epidemic occurs can lead to better performance during an epidemic.

This study showed that the current PHC structure does not respond to critical situations such as epidemics of infectious diseases, and its structure and operation should be adapted to the needs of the people. In a study in 2021, it was shown that the response to the epidemic of COVID-19 is supported by PHC, and in this regard, they have strengthened the PHC so that it can continue its activity and thereby control the transmission chains of the disease in the community.[5] With the spread of emerging diseases such as COVID-19 and the change in people's care needs, the need to change the structure and processes of the health system can become more apparent to be able to respond to epidemics.

The workload in health centers increased with the start of the epidemic. In addition to providing routine services for the people under their care, health workers must also provide services appropriate to the epidemic, such as screening, care, and follow-up of infected people. Various studies have shown that the responsibilities of PHC to control and prevent epidemics in rural areas have increased.[18] There is a possibility of an increase in workload with an increase in the need for care and follow-up, and if there is a balance between the two, epidemics can be better managed.

The present study has also raised the remaining services during the epidemic as a challenge for the management of the COVID-19 epidemic. Some studies[19-21] showed a reduction in the services provided by PHC. The reason can be attributed to people's fear of going to health centers due to the contamination of these centers or the fear of service providers from getting infected if they provide services. On the other hand, health service providers were under work and financial pressures and there was no recommendation for essential clinical services were not provided by PHC early in the epidemics.[22] With increasing work pressure, there is a possibility of reducing the provision of routine and basic services.

This study showed the challenges on the path of PHC during epidemics. The lack of necessary infrastructure in rural areas and on the outskirts of cities was one of the important factors for the proper management of epidemics. Another challenge was the way of providing services, stopping in providing routine services, lack of personnel, lack of prior preparation for epidemic

management in managers and health workers, and surprise in the face of COVID-19. The results of other studies were also in line with our study. In a study, they reported the use of telephone or video consultations in PHC services, and the necessary budget for this type of care from the government.[23] In other study, the creation of people's access to remote services was emphasized and the need to create the necessary infrastructure was considered essential.[24] Due to the rapid spread of emerging diseases, the need to use new technologies and telemedicine is increasing. The training of new technologies before the outbreak of the epidemic and the evaluation of the educational effectiveness of providing telemedicine services during the epidemic can be done.

In the present study, the provision of sufficient human resources for the management of infectious disease epidemics was identified as one of the priorities of the response to the epidemic, to create the necessary training and the appropriate capacity for quick response in healthcare workers. In a study, the number of sufficient and trained personnel from preparedness factors for managing epidemics have been obtained and used as a key element of any PHC system to ensure health.[25-27] The lack of manpower can be due to the lack of proportionality of the increase or change in the health needs of the people and the number of manpower. By changing the will of the service or increasing the manpower, epidemics can be better managed.

In our study, it was shown that in terms of the physical structure of the PHC or the physical infrastructure, it faced problems such as the smallness of the centers, the lack of isolation rooms, the lack of proper ventilation for epidemic conditions, and the lack of separate entrances to the centers during an epidemic. In a study, the same thing was shown. In Brazil, the physical structures of PHC are scattered, and it was shown that these deficiencies caused insufficient care during the outbreak of the epidemic, when various tasks were performed for respiratory symptoms and patients had to be settled in these centers.[15,28,29] In the present study, centers named as selected centers for COVID-19 were established for specific care of COVID-19.[30] Due to the lack of infectious diseases, reforms have not been made in the type and structure, and there is a possibility of strengthening the health system to deal with epidemics with the emergence of COVID-19 in countries.

In this study, it was shown that at the beginning of the epidemic, people denied the existence of COVID-19 and faced cultural problems, for example, they hid their illness, this case also showed itself in vaccination. They did not accept it. An example from another study also showed the same result. In a survey on influenza vaccination in 2009, about one-third of people were reluctant to receive the vaccination even after public health messaging.[31] Nonacceptance can be due to the lack of previous education about infectious diseases and epidemics to people. With the absence of infectious diseases in recent years, there was a possibility of not accepting the existence of this disease. With continuous training and increasing health literacy of the people, we can play an important role in preventing and accepting the disease by the people.

Limitation of study

This study was conducted during the outbreak of the COVID-19 pandemic, which caused some interviews to be conducted online, which was solved by increasing the number of interviews. Some of the consequences of COVID-19 on the level of PHC services cannot be obtained in this study and future studies are suggested. For example, quantitative studies on the challenges are needed so that policy-makers and health system managers can carry out scientific and effective planning.

Conclusion

The present study showed the activities that Iran's PHC performed during the COVID-19 epidemic and the challenges it faced, as well as strategies to combat. In this study, the performance of PHC and the challenges in the management and control of COVID-19 were reviewed. The challenges that PHC faced during the epidemic provide opportunities to be more prepared to deal with possible pandemics and to know if we have had a proper performance in dealing with the past pandemic or not. Studies in the field of fundamental changes in the structure of PHC can be useful to create response capacity in pandemics.

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Author Contributions

S.H.E. contributed to designing research questions, searching databases, extracting data, analyzing, and writing articles.

A.A.S. contributed to designing research questions, extracting data, analyzing, and writing articles.

G.K. contributed to analyzing and writing articles.

K.H.S. contributed to data collecting.

All authors read and approved the final manuscript.

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Conflicts of interest

There are no conflicts of interest.

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Additional file 1: Interview guide

Demographic characteristics and background information of the participant

Interviewee code:.....

Gender: female □ male □

Age:.....

Work history: student □, 0-5 years □, 6-10 years □, 11-15 years □, 16-20 years □, 21-25 years □ and 25 years and above □

Management work experience:

0-5 years□, 6-10 years□, 11-15 years□, 16-20 years□, 21-25 years□ and 25 years and above□

Organization level:.....

Number	Questions
1	In your opinion, what are the most important measures and programs of Iran's primary health care system in managing the covid-19 epidemic?
2	In your opinion, what are the most important achievements of Iran's primary health care system in managing the Covid-19 epidemic?
3	In your opinion, what are the most important challenges and problems in Iran's primary health care system in the management of the Covid-19 epidemic?
4	Your operational solutions to improve the performance and role of the primary health care system in managing the epidemic of infectious diseases in different areas (how to educate and empower people, internal and external coordination, provision of basic and necessary resources and facilities, information management What is epidemic, how to provide services, how to monitor and evaluate service delivery...)?