Care Needs and Preferences from Perspective of COVID-19 Patients: A Qualitative Study

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Research

Keywords: Coronavirus Disease 2019, Needs Assessment, Health Preferences, Iranian Health System, Qualitative Study

Posted Date: August 11th, 2020

DOI: https://doi.org/10.21203/rs.3.rs-51208/v1

Abstract

Background: COVID-19 epidemic is one of the major health problems all over the world due to its amazing spreading power and potential damage. Given the increasing prevalence of the disease, identifying the care needs and preferences of patients will play a very important role in providing effective training and caring programs for them. This study aimed to explain the Preferences and needs of care based on the experiences of people with COVID-19.

Methods: This qualitative study was carried out over a period of 2 months in medical and recovery units of COVID-19 referral hospitals in Tehran, the capital of Iran in 2020. The Participants consisted of 15 COVID-19 patients selected through purposive sampling.

Results: The results were classified into five main categories as “Access to desirable care and comfort services”, “Access to education and information from credible sources”, “Access to specialized care” “Support-social needs” and “Need for deep emotional interactions”.

Conclusions: According to the results, identifying priorities and care needs from the perspective of patients with COVID-19 can help improve knowledge, reduce unrealistic patient concerns, and improve emotional interactions between patients and health care providers.

Background

COVID-19 epidemic, caused by a novel beta coronavirus called SARS-CoV-2, emerged in China in late December 2019 and spread around the world in less than four months. On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic, stressing the danger of this outbreak for public health (1).

Outbreaks of infectious diseases have always been as difficult health challenges, threatening the wellbeing of people not only directly but also indirectly through their effects. In the early stages of the spread of SARS and MERS, there many reports of a wide range of outbreak-induced psychological problems, including depression, anxiety, panic attacks, psychotic excitement, psychotic disorders and even suicide (2, 3). For these outbreaks, the lack of participation of patients in care decisions, poor isolation during hospitalization, and failure to respond to patients’ requests have been identified as the most important management challenges in the medical sector (4). The top preferences from the perspective of hospitalized patients, however, have been nurse-patient communication and interactions and access to personal protective equipment and comfort during hospitalization (5, 6).

Today, the quality of care in health care systems draws even more attention and scrutiny (7). Naturally, the quality of hospital processes and services cannot be improved without the active pursuit of patient satisfaction and special attention to patients’ needs and expectations in terms of comfort as well as clinical services (8). Thus, health systems should be committed to identifying and meeting the

psychological, physical, and other needs of patients during the treatment process (9). Patient care needs are a complex, multifaceted, and contextual concept that has been much discussed in the literature (10).

The patient needs that have received the most attention in the literature are the psychological, therapeutic, and care needs (11). With the surprising emergence and spread of COVID-19 pandemic, the unknown and ambiguous behavior of the virus and the poor knowledge of health care personnel of all levels about treatment and care methods and requirements for these patients created a sense of profound uncertainty and anxiety in many health care personnel and patients, especially in the early days (12).

According to the WHO, the effects of COVID-19 will certainly persist until the end of 2020 and the outbreak may very well return to plague the world in the coming years (13). Therefore, identifying the basic needs of COVID-19 patients and determinants of their satisfaction and peace of mind during treatment can have a deep impact on the quality of treatment and care services in this area.

Considering the shortage of in-depth studies on the educational, health and care needs and requirements of COVID-19 patients and the fact that quantitative research methods fail to provide deep insights into beliefs, thoughts, and attitudes of their subjects, the use of qualitative research methods to identify the needs and preferences of COVID-19 patients may be able to greatly contribute to progress in this field. Indeed, qualitative studies discover the needs of patients from their own words, thereby providing deeper and more objective insights into the unique experiences of these people (14).

The present study was part of a large research on Iranian COVID-19 patients, which, in this part, aimed to identify the care needs of these patients from their own perspective and their preferences while receiving treatment.

Methods

This qualitative study was conducted in 2020 with the purpose of determining the care and treatment needs of Iranian COVID-19 patients. The study was carried out over a period of 2 months in medical and recovery units of COVID-19 referral hospitals in Tehran, Iran. The sample consisted of 15 COVID-19 patients selected through purposive sampling. The inclusion criteria were: diagnosis of COVID-19, no history of physical or mental disability, the ability to communicate, and the willingness to cooperate. For triangulation in data sources, some interviews were performed with the participation of health care workers. The participants were chosen for maximum possible diversity in terms of age, sex, education, and history of admission in medical and recovery units.

Data were collected through semi-structured one-on-one interviews with 6 patients, two focus groups interviews with a homogeneous group of 4-6 people, and telephone interviews with COVID-19 patients being treated in medical and recovery units. The time and place of interviews were determined by the mutual agreement of the patients and the researcher. Each interview was 15 to 30 minutes long.

The interviews in medical and recovery units were conducted in a convenient location in terms of noise, light, and privacy (lounge or private rooms). The group interviews were performed with the attendance of participants, who were seated in a circle, the researcher, who was in charge of managing the meeting, and a colleague, who was taking notes on the issues raised during discussions.

At the beginning of each interview, the researcher introduced herself and explained the objectives of the study. The consent of all the participants was obtained to record the interviews.

During the interviews, verbal communication and non-verbal behaviors such as eye contact and changes in facial expressions were noted and recorded. Interview sessions were held in the mornings or evenings and scheduled at the convenience of the participants. To keep the interviews uniform, a number of guide questions were prepared for use in all sessions. Each interview was started with the general question "Would you please tell us about your experience with COVID-19?" and continued with more specific questions such as "What were/are your health care needs during hospitalization?" and "What problems did/do you face?". When necessary, the researcher asked exploratory questions such as "Please explain more", or "What do you mean by this sentence you said? The interviews continued until data saturation. Data analysis was performed using the contractual content analysis method according to the procedure proposed by Graneheim and Lundman. First, the interviews were transcribed verbatim and reviewed several times. Then, words, phrases or paragraphs that could be meaning units were identified and coded. The codes were compared to identify similarities and differences and then classified into more abstract categories. The members of the research group continuously discussed the choice of codes and their categorization into themes and sub-themes until reaching a consensus in this regard. Data collection continued until saturation in each category, after which the results were typed and coded manually.

Lincoln and Guba's criteria were used to improve the accuracy and rigor of data. To ensure credibility, the researchers spent enough time on data collection, created a sample with maximum possible diversity (age, education, and sex), remained engaged with the data for a prolonged period of time, and discussed the data and interpretations with the participants (member checking). To ensure dependability and reliability, the methods were shared with colleagues for review. To ensure the confirmability of the findings, the researchers tried to not allow their biases to impact data collection and analysis. And finally, to ensure transferability, the researchers tried to provide a detailed description of the processes of data collection, encoding, and analysis.

Results

The patients participating in this study were mostly men (87%) and had a mean age of 50.85±6.02 years. Approximately half of the participants (54%) had higher education. The mean duration of infection with COVID-19 was 7.57±5.15 days.

After identifying and reviewing the codes, they were categorized, based on their similarities, into 5 main categories and 15 sub-categories. The main categories obtained from this process are: "Access to desirable care and comfort services", "Access to education and information from credible sources",

“Access to specialized care”, “Support-social needs”, and “Need for deep emotional interactions”. The descriptions of these categories and their sub-categories are presented in the following.

1. **Access to desirable care and comfort services**

This refers to the need of COVID-19 patients to receive quantitatively and qualitatively acceptable care from committed and skilled healthcare workers, to have sufficient access to protective equipment, to be provided with a safe and healthy physical space, and to be looked after in terms of basic needs. These sub-categories are further explained in the following.

A) Need to skilled and committed healthcare workers

The presence of a skilled and committed medical team is a key determinant of the efficacy of treatments and patient recovery. Access to specialized care provided in a committed manner, especially for diseases that do not have any definitive or approved treatment, can play a significant role in the prognosis of patients.

In this regard, Participant No. 1, (male, 61 years old) said:

“*I cough for hours, but no one cares! They just give me oxygen. Shouldn’t a doctor come check me? When I tell the nurses, they say we’ll call the doctor, but your situation is normal*”.

Having a sufficient number of health care workers is extremely important for making sure that all COVID-19 patients receive the necessary care for this disease. The presence of enough personnel to meet the treatment and care needs of patients is one of the essential requirements of sustained treatment.

In this regard, Participant No. 5 (male, 49 years old) stated:

“*Our problem is that there is not enough manpower in the ward. In the last shift, the mother of one of the nurses died in this very same ward, so she left. My nurse, who already had 3 patients, now had to serve 4 patients; two of them were critically ill and were on respirator. The way it is, often, they don’t have enough time to look after all of us*”.

B) Protective equipment

Since the commitment to cautionary protocols such as using masks, frequent hand washing, and other protective measures is essential for protecting healthy individuals and limiting transmission, access to modern and high-quality protection equipment for COVID-19 patients as well as healthcare workers is one of the important needs of these patients.

Regarding the need for appropriate equipment to control the disease and receive proper care, Participant No. 4 (female, 53 years old): said:

"*When I ask for a mask, they don't give me one, saying you must put on your oxygen mask. When I say, what I keep in front of my mouth when I want should go to the bathroom; they say we are short of masks…*"

Also, Participant No. 2, (male, 52 years old) stated:

"*There are many shortages. I cough all the time. They say that you should put on these oxygen mask 24 hours a day. When I say give me a mask to prevent spreading the virus. …. Nurses and staff say we don't even have enough masks for ourselves*!!!"

C) Safe and healthy physical space

Creating a well-ventilated environment with good air circulation is one of the ways to control the transmission of the disease. Access to such a safe and healthy space was another request of patients.

In this regard, Participant No. 5 (male, 49 years old) said:

"*The ward doesn't have proper ventilation. You can leave the terrace door open to allow the airflow through, like a corridor, but they don't do this…*".

"*A few days ago, some guys from health ministry sprayed the whole area, the beds, the floors, the tables, everything; but they didn't return…, I think this should be repeated every day*."

Also, a participant in Focus Group 1 (male, 48 years old) stated:

"*The recovery area is not suitable for hospitalization. We don't have adequate lighting. The space is confined and everything is squeezed to each other. It is not well ventilated at all. It is very cold at night and doesn't have enough oxygen during the day*."

Participant No. 4 in Focus Group 2 (Male, 51 years old) also said:

"*I have a lumbar disc. It's really hard for me to rest on these beds. It is a hard bed with a thin blanket. Also, the beds that don't have side rails, so we may fall dawn at night…*"

D) Unmet basic needs

COVID-19 changes the sense of taste and smell and significantly affects the appetite of the patients. Therefore, attention to basic needs is a preference for these patients. One of the common complaints made in the interviews was the lack of enough specialized attention to basic needs such as diet.

For example, Participant No. 3, (male, 37 years old) stated:

"*Food quality is terrible; the foods they provide have nothing to do with the disease. The disease also makes it not easier to eat here*."

As patients overcome the acute condition of the disease and start to recover, their nutritional needs also increase, which is why it is recommended to provide more meals during the recovery period.

In this regard, Participant No.1 in Focus Group 2 (male, 32 years old) said:

"*The hours of the meals are not good. For example, we have to stay hungry from 7 pm to 7 am. Instead of eating my entire dinner at once, I eat it slowly until 11. But we don't have anything to heat food. So, if you want to wait a few hours, you will be eating cold food*."

Because of the long stay of patients and their isolated conditions, it is important to pay attention to their basic hygienic needs as well.

For example, Participant No. 4, (woman, 53 years old) stated:

"*Bathrooms with proper appliances are very important for hygiene. Unfortunately, the space provided is not suitable for women*."

2. **Access to education and information from credible sources**

This category refers to the need for patient education based on credible information about the disease and how it can be prevented, controlled, or treated and also the need to help patients make sense of the conflicting information that they may receive from different sources.

A) **Need for education based on credible sources**

Providing COVID-19 patients with up-to-date credible information, especially through physicians and nurses, and keeping them involved during hospitalization can prevent possible complications and facilitate recovery by enhancing self-care.

Regarding patients' need for education, Participant No. 5 (male, 49 years old) stated:

"*I wish there was a law forcing doctors or nurses to give a scientific explanation of our situation to our families so that they would not be subjected to such stress*."

B) **Need to know how to make sense of conflicting information**

Today, social media and networks play an important role in disseminating both reliable and unreliable information. Naturally, the dissemination of conflicting information through these networks and other web services can confuse patients.

For example, Participant No. 5 (male, 49 years old) said:

"Every day, false news from websites makes patients and their families even more confused. Every day, they introduce a new way to control or treat the virus, which later you find out is completely baseless. You really don't know which is true and which is not."

Or, participant No. 3 (male, 37 years old) stated:

“The way it is, we’re really confused, we don’t know which news is right and which is false, we can’t trust the internet.”

3. **Access to specialized care**

One of the most important needs of patients with COVID-19 was to receive specialized care, that is, comprehensive care under unstable conditions, knowledge of the treatment process, and the constant presence of caregivers at the bedside. These three sub-categories are described below.

A) Need for care under unstable conditions

One of the confirmed features of COVID-19 is clinical instability and sudden changes in hemodynamic conditions, which make the patient dependent on extensive care.

In this regard, Participant No. 2, (male, 52 years old man) said:

“*... Our situation is so bad that we don’t notice the passage of time. Nurses constantly get our blood pressure and temperature. Doctors constantly examine us. Sometimes I get physiotherapy. Our condition is constantly changing; the patients to my left and right side were good in the morning, both died on the same day…*”

B) Need to know the treatment process

One of the demands of patients and their families was to keep being updated about their conditions. Since families are not allowed to visit their patients in medical wards, they are constantly anxious to know about the latest condition of their patients.

In this regard, a patient in Focus Group 1 (male, 21 years old) stated:

“*My family members called the ward for several days in a row? The nurses were saying to them: your patient is like yesterday; he hasn’t changed at the moment. It’s important for the family to know about the patient’s medical condition*.”

Also, Participant No. 5 (male, 49 years old) said:

“*I’m not complaining about how these employees keep working in these difficult conditions, but I am not satisfied with the way doctors and nurses treat me. I don’t know anything about the course of my illness. The doctor who examines me should at least try to explain my condition*”.

C) Need for the constant presence of caregivers at the bedside

The changing and critical conditions of some patients require close and continuous care and reexamination to assess how the disease is progressing or regressing.

For example, Participant No. 4 (female, 53 years old) said:

"*… I don't really understand the visit, because I don't usually see a doctor come near my bed. I haven't seen the doctor in these few days; they just write something on my file from afar and leave…*"

Also, a patient in Focus Group 1 (male, 32 years old) stated:

"*… In the morning, someone writes the name of a doctor and a nurse on the board above our head. Sometimes I ask something from an employee, even a nurse, they just say wait for your nurse to come…. my medicine has run out and the machine is sounding an alarm …. they say the new medicine will start once your own nurse is here….*"

4. **Support-social needs**

The sub-categories of support-social needs of COVID-19 patients were as follows: the financial burden of treatment, insurances' poor coverage of costs, problems with returning to work, social assistance to reduce financial burden.

A) Financial burden of treatment

Since COVID-19 is an emerging and unknown disease and still does not have a definitive cure, the patients must receive multiple treatments simultaneously, and this substantially increases the financial burden of this condition.

In this regard, Participant No. 6 (nurse, 35 years old) said:

"There was no treatment protocol. Therapies were mostly experimental. Every day a new treatment was being recommended. One day, they were saying do this, the next day, they were saying now try this one. These things cost a lot."

B) Insurances' poor coverage of costs

The variety of treatments and drugs used on COVID-19 patients greatly increases the cost of treatments and services provided. Meanwhile, a number of drugs or treatment protocols are not covered by health insurance, imposing a great financial burden on patients.

Regarding the financial problems caused by poor insurance coverage, a patient in Focus Group 2, (female, 25 years old) said:

"*We have a problem with hospital bills. Should I bear the pain of the disease or the pain of hospitalization cost? They gave my family a prescription, saying that the hospital doesn't have the drugs, so you should get them from elsewhere. The prescription costs a lot, and we have to pay out of pocket. Well, I have health insurance, but why it isn't covered by insurance? In this crona condition (referring to pandemic), should they send my family to fetch medicine*?"

Also, Participant No. 2 in Focus Group 1 (male, 61 years old) stated:

"*Fearing that their insurance will not cover them, many patients prefer to go home and risk getting their family infected, because they think it will cost a lot and they will not be able to handle it*."

C) Problems with returning to work

Returning to work after recovery was one of the concerns of patients, especially those with non-governmental jobs.

For example, Participant No. 3, (male, 37 years old) said:

"*My main problem is my job; I am a worker; what should my family do financially? This brings me more anxiety than the disease itself. I am afraid of being fired by my employer*."

D) Social support to reduce financial pressure

COVID-19 has negatively affected Iran in many ways, but it has also generated a sensation that all Iranian have a common destiny and their wellbeing depends on the wellbeing of others.

In this regard, Participant No. 6 (nurse, 35 years old) stated:

"*Many patients have financial problems, but there is a sense of empathy that has caused people to help patients by bringing food or even paying medical expenses*."

5. **Need for deep emotional interactions**

One of the main elements of hospital care is to provide emotional support and peace of mind by establishing a good relationship with patients. One of the needs of COVID-19 patients was related to the lack of deep emotional interactions, which manifested in two sub-categories: challenges in establishing good relationships and a sense of empathy in a stressful and complex environment.

A) Challenges in establishing good relationships

One of the important determinants of the quality of care and consequently the outcome of treatment is whether there is a good relationship between health care workers and patients. This was also found to be an important need of COVID-19 patients.

In this regard, Participant No. 5 (male, 49 years old) said:

"*Nurses keep their distance and don't want to make any contact; despite that they wear space suites, masks, glasses, shield, gun, shoe cover, even have multi-layered gloves, and the patient is also masked. This is running from the patient; this means taking an emotional distance*!!!".

B) Sense of empathy in a stressful and complex environment

Empathy is an active effort to understand others and an emotional response to their situation. It is the ability to see things from another person's point of view and to behave in a way that heals the suffering of others in acts that often involves courage and philanthropy based on socially acceptable behaviors. Empathy can be viewed as the opposite of being indifferent to others. Empathy is healing and improves patients' physical and mental conditions.

In this regard, a participant in Focus Group 2 (female, 28 years old) said:

"*…Working for and serving coronavirus patients, who carry millions of viruses, requires love. This should not become pure duty. The person must remain in love with the work…*"

Also, a participant in Focus Group 1 (male, 36 years old) stated:

"*…I enjoy how seminary students help out without any ego, it is very good. They just do their service lovingly. They try hard to make you comfortable, with pleasure. This is great in this situation; but they just come here for a few hours. I wish they were here all the time…*"

Discussion

During the course of their disease and treatment, COVID-19 patients experience an acute and critical condition, under which they develop certain needs that must be met with help from others, and specifically health care workers. The aim of this study was to identify the care needs of these patients from their own perspective. After analyzing the collected data, this study identified five main categories of needs: "Access to specialized care desirable care and comfort services", "Access to specialized care education and information from credible sources", "Access to specialized care specialized care", "Support-social needs", and "Need for deep emotional interactions". In other words, the participants believed that the fulfillment of these needs should improve the treatment and care conditions of COVID-19 patients.

Meeting the needs and expectations of patients is one of the most important tasks of health care organizations, as it encourages patients to carry out physician orders correctly and in a timely manner, which works toward the main goal of the whole process, that is, accelerates the treatment and recovery processes (15). Health care services are among a few groups of services that everybody needs but may not necessarily desire (16). Nevertheless, patient satisfaction is an important element of care and treatment service evaluations. Indeed, meeting the needs of patients in a way that results in their satisfaction indicates that the hospital is successful in properly delivering its services (17). In Iran's Health Sector Transformation Plan, hospital hoteling services have been defined in seven main areas: quality of buildings and facilities, quality of equipment, quality of comfort, quality of cleaning and sanitation, quality of nutrition, quality of administrative affairs and workflow, and quality of human resources (18). In a study that examined the patients' views on how well their needs are met, it was reported that the quality of comfort, human resources, cleaning and sanitation services, hospital buildings, hospital equipment, and nutrition have an impact on the loyalty of patients (19). Other studies

have identified parameters such as the presence of committed health care workers, access to adequate protective equipment, having a safe physical space, and meeting the basic needs of patients as the factors affecting patient satisfaction (20). While access to protective equipment is a health requirement for all hospitals, it was identified as one of the most important needs in hospitals that provide care for COVID-19 patients. Therefore, ensuring access to an adequate supply of protective equipment is essential for the safety of healthcare staff as well as patients (21). Considering how hospitals needed to quickly set up new wards or change the application of their existing wards for treating COVID-19 patients, there were some shortcomings and deficiencies in how the needs of critically ill patients were met, which indicates that hospitals were unprepared for such a crisis.

Another need of COVID-19 patients was in relation to education and the acquisition of credible information. Since COVID-19 is an emerging disease with unknown treatment, accurate and validated education is a critical component of all efforts to control this outbreak. However, in the age of massive social and information networks, not only it is difficult to distinguish between true and false information, but it is also imperative to avoid the negative psychological effects of overexposure to information (22). To tackle this problem, healthcare organizations, physicians, and nurses must be actively involved in these media and steer their audience toward credible sources (23). Medical personnel are also duty-bound to get perfectly familiar with health precautions and standards and to teach them to patients and their families as well as ordinary people as much as possible, as people need and heed the guidance provided by healthcare professionals especially nurses. Many studies have shown the patients' need to receive specialized education about their diseases (24, 25). In the case of COVID-19, reliable information about the virus and how to protect against exposure and treat the infected is an essential educational need of these patients.

One of the most fatal complications of COVID-19 in patients with this disease is acute respiratory failure, which usually occurs about a week after the onset of symptoms and is characterized by rapid progression, followed by shortness of breath and hypoxemia. As a result, these patients need to receive specialized intensive care, including care under unstable conditions and continuous treatment by healthcare workers, and also to be kept informed about their treatment process. Another need of these patients is access to committed specialized care of sufficient quality and quantity. Attempting various therapies, careful monitoring of patient's condition, providing specialized nursing care, early detection of complications, and management of uncontrollable conditions have been reported to be the most important treatment measures for COVID-19 patients (26). All of the above results are consistent with the findings of this study.

In this study, the financial problems of COVID-19 for the patients including the financial burden of treatment, the problems of returning to work, and the insurances' poor coverage of treatment costs and their need for social support were placed in the support-social needs category. Likewise, another study identified the non-transparent financial costs, disparities in the health care system, and the work pressure on trained personnel as barriers to effective care and treatment, especially in patients in need of high

levels of care. This study also showed that integrating social support with medical care and creating financial care guidelines will improve the quality of care (27).

The COVID-19 pandemic has created a global crisis of such severity that not only has necessitated drastic behavioral changes, but has also placed a heavy psychological burden on patients and their families. The cultural, social, and ethical implications and requirements of providing care and treatment to these patients have become more important with each passing day. Indeed, one of the important needs of COVID-19 patients was found to be the need to have deep emotional interactions. Another study has also reported that compassionate empathy is among the most important types of interaction and relationship between the patient and health care workers in the present century (28). The success of health care workers to establish a strong relationship with a sense of empathy with patients has been reported to have a great impact on the patients' recovery, perceived self-value, distress, satisfaction, and hope (29). Also, it has been shown that patients who feel compassionate empathy from their physicians and medical staff are more successful in overcoming acute symptoms more quickly and have strengthened immune systems (30). COVID-19 patients must endure not only severe physical conditions but also the stress of social and individual isolation due to the infectious nature of the virus, which disrupts their relationship with their family and friends and also healthcare workers. Socially isolated patients are known to have a higher risk of perceived insecurity, physical drug side effects, fear of transmitting the disease to others, fear of negative news on social media, experience of loneliness, anxiety, stress, insomnia, and post-traumatic stress symptoms (31). Poor attention to the patients' needs to maintain deep emotional interactions can have wide-ranging psychological and emotional consequences for these people (32).

Given the qualitative nature of the study, the small number of participants, and the selection of subjects from the medical centers of one city, the findings may have limited generalizability to other locations. Considering the persistence of the COVID-19 pandemic, the results can be used to prepare care guidelines for achieving better outcomes for these patients. Future studies are recommended to design interventions based on these findings and examine their effect on the outcome of the disease.

Conclusion

COVID-19 patients experience a wide range of symptoms and problems, which put them in need of extensive treatment and care. According to the findings of this study, the most important care preferences for these patients are access to education and information from credible sources, access to specialized care, the fulfillment of support-social needs, and the fulfillment of the need for deep emotional interactions. Considering the ambiguous nature of COVID-19 and its extensive complications, the use of past experiences to meet these needs may be able to improve and enhance the results of treatment and care efforts for COVID-19 patients.

Declarations

Ethics approval and consent to participate

The present study has been approved by the Ethics Committee of Baqiyatallah University of Medical Sciences, Tehran, Iran, with code IR.BMSU.REC.1399.026.

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

The datasets analysed during the current study are available from the corresponding author on reasonable request.

Funding:

No funding was received for this study.

Author contributions:

All authors contributed to data analysis, drafting or revising the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Acknowledgements:

We wish to acknowledge all the participants contributed in any way for the completion of this study. This project was completely supported and funded by Baqiyatallah University of Medical Sciences, Tehran, Iran. Thanks to guidance and advice from the "Clinical Research Development Unit of Baqiyatallah Hospital of Medical Sciences, Tehran, Iran.

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Figures

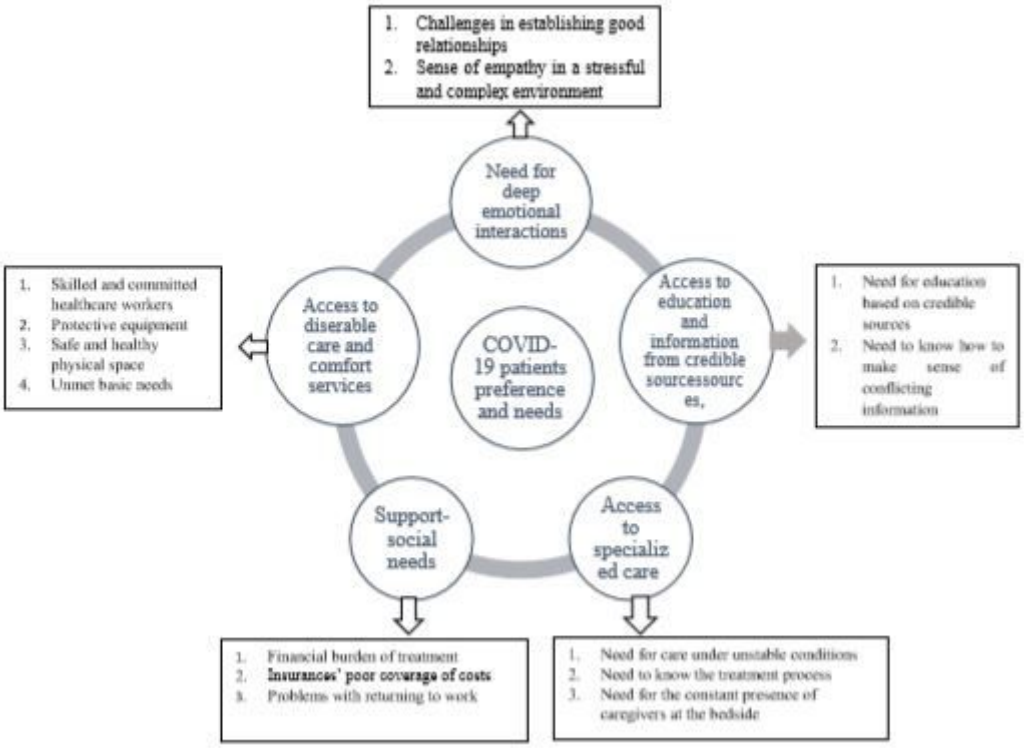

Figure 1

Five categories' of needs and preference from the perspective of COVID-19 patients