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Investigating healthcare practitioners’ attitudes towards the COVID-19 outbreak in Saudi Arabia: A general qualitative framework for managing the pandemic

Fahad Alanezi a, Anan Aljahdali b, Seham M Alyousef c, Wyam Alshaikh d, Hayat Mushcab e, Bashair AlThani f, Fatemah Alghamedy a, Hussah Alotaibi g, Sharifah Alrajhi h, Dhabia Alabbadi i, Turki M Alanzi j

a Community College, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia
b Biological Science Department, Faculty of Science, University of Jeddah, Jeddah, Saudi Arabia
c Community and Psychiatric Mental Health Nursing Department, Nursing College, King Saud University, Riyadh, Saudi Arabia
d King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia
e Johns Hopkins Aramco Healthcare, Dhahran, Saudi Arabia
f College of Business Administration, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia
g Art College, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia
h Statistics Department, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia
i Health Information Management and Technology Department, College of Public Health, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

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ABSTRACT

Background: Some previous studies have investigated the attitudes of healthcare professionals towards certain aspects of the COVID-19 outbreak. In addition, some general frameworks have been proposed to manage the pandemic.

Objective: The purpose of this article was to analyze the attitudes of healthcare practitioners in Saudi Arabia towards the treatment of patients with COVID-19, work planning of practitioners, leadership approaches to manage the pandemic, sharing information strategies, medical errors, compliance with procedures, and challenges faced by the practitioners. Furthermore, another objective was to propose a general framework for managing the COVID-19 outbreak in Saudi Arabia.

Methods: To achieve these purposes, a survey was designed based on an online questionnaire that was initially sent via WhatsApp, Twitter, Facebook, and email to 336 healthcare practitioners working in 7 hospitals in Saudi Arabia. The response rate was 30.4%.

Results: The outcomes indicated that healthcare practitioners in Saudi Arabia had positive attitudes towards effective communication and interaction between health professionals and patients, leadership and maintenance of team coordination, work planning, communication and cooperation between team members, training and skills development of healthcare professionals, implementing strict procedures to avoid errors and control the spread of the COVID-19 pandemic, maintaining an adequate supply of medicines and medical equipment, and obtaining the support of the government, the community, and the people.

Conclusion: Based on the findings, it was possible to suggest that the management of health care operations related to the COVID-19 outbreak in Saudi Arabia requires effective collaboration and information sharing among various stakeholders. In this sense, communication, effective leadership, coordination and work planning, adequate treatment for patients, strict compliance with hospital rules and procedures, preventive and regulatory measures, and training and support for health professionals, were parameters considered in the general qualitative framework suggested in this study for managing the COVID-19 pandemic in Saudi Arabia. The propositions presented in this study can help the Saudi Arabian government implement an effective plan to control the spread of the COVID-19 pandemic in this country.
1. Introduction

The COVID-19 pandemic has spread to most of the world, and by mid-November 2020, more than 53, 700, 000 cases of confirmed infected people and more than 1,300,000 deaths had been recognized [1]. The first cases of COVID-19 were reported in late December 2019 in Wuhan, China [2]. Subsequently, the pandemic has spread to almost the entire world and has caused adverse effects on the economic and social activities of most countries [3]. The COVID-19 virus is rapidly spreading, contagious, and continually evolving in humans [2]. Symptoms in patients can include fever, cough, dyspnea, headache, muscle aches, sore throat, nasal congestion, fatigue, among other possible signs [4]. These symptoms can appear 2-14 days after exposure to the virus. The virus is transmitted when an infected person coughs, sneezes, or talks, and drops of saliva or nasal secretions reach the mouth, nose, or eyes of a close person [5]. To minimize the chances of becoming infected with the disease, it is necessary to use a mouth cover or a suitable mask, and wash your hands frequently with soap and water, alcohol or another disinfectant. Also, it is advisable to stay away more than 1 m away from other people.

On the other hand, the attitudes and perceptions of health workers regarding the COVID-19 outbreak have varied in different countries of the world since the beginning of the pandemic [6-14]. In Saudi Arabia, one study showed concern about the severity of the disease, the results of treatments, and government efforts to contain the spread of the infection [6]. Another study in Northwestern Ethiopia found that improving awareness through health education was an important strategy to address the COVID-19 pandemic [7]. Similarly, healthcare providers in Pakistan considered that training programs were necessary to improve the knowledge of health providers about preventing the risks of the COVID-19 outbreak [8]. In Nigeria, research on health workers’ attitudes, fears, and knowledge of COVID-19 infection revealed the need to provide health workers with personal protective equipment and training [9]. Likewise, another study conducted in Egypt noted the importance of equipping health workers with personal protective equipment [10]. In South Africa, the lack of leadership has created limitations in the provision of services to combat COVID-19 [11]. As for China, healthcare providers were concerned about the risks and the need to use personal protective equipment [12]. Other general aspects about the attitudes of health professionals towards patients have been pointed out in several previous studies [15-24].

It is important to mention that during pandemics, the attitudes of health professionals can be influenced by the risk of exposure to infection or by increased stress and workload [25]. In this regard, some studies have investigated the impact of pandemics on the attitudes of healthcare professionals and the challenges they face [26-28]. Overall, positive attitudes of healthcare professionals towards patient safety [29], privacy [30], and technology-enabled approaches such as remote monitoring of patients [31] have been observed. In relation to the COVID-19 outbreak, the work environment has varied greatly from a normal healthcare setting to a situation that involves rapid changes in service delivery, procedures and compliance, ethical issues, and treatment preferences related to the support and acceptance of patients, among other factors. In these circumstances, leadership is very important to maintain a positive attitude in the midst of the COVID-19 pandemic [25].

Furthermore, some general frameworks have been proposed to handle the crisis generated by the COVID-19 outbreak [32-39]. However, these frameworks are very broad and do not specify the procedures that must be carried out to manage the COVID-19 pandemic in each country. In general, these frameworks are directed to the institutions, communities and governments of the countries of the world and suggest adapting medical systems to control and prevent the spread of COVID-19; establish policies to mitigate the disease and reduce the transmission of the pandemic; protect communities and detect possible disease transmission scenarios; provide emergency funds and health insurance; establish and extend social protection to the entire population; disseminate accurate information about the pandemic; promote education about the COVID-19 using social media and television; ensure the supply of water, food, energy, medicine, and other medical materials; improve the operation and management of emergency systems; improve leadership and communication between government and communities; evaluate the economic and social impact of the COVID-19 pandemic; ensure that governments and communities coordinate and implement recommended actions, etc.

Related to this research, it is convenient to point out that the human resources departments of hospitals have considered that the attitudes of health personnel are an important area to consider in the process of developing strategies to improve the efficiency of these institutions [17]. Regarding this topic, several studies have investigated, from various perspectives, how the attitudes of health workers towards medicine, work culture and professionalism, robots in service, patients, and other aspects can help to improve the overall quality of health care [15-21].

Based on the aforementioned aspects and considering that in Saudi Arabia only a limited study [5] was found on the attitudes of health professionals towards the COVID-19 outbreak, and no study was observed on the proposal of a framework to face the crisis generated by the pandemic, the objective of this article was to analyze the attitudes of healthcare practitioners in Saudi Arabia towards the treatment of COVID-19 patients, work planning of healthcare providers, leadership approaches for handling the COVID-19 pandemic, information sharing methodologies, medical errors and procedural compliance, and challenges faced by the healthcare practitioners in dealing with the COVID-19 outbreak. Also, taking into account the attitudes of healthcare practitioners, a general framework for managing the COVID-19 pandemic in Saudi Arabia was suggested.

It is pertinent to mention that this study is significant because it analyzes the attitudes of healthcare practitioners towards areas not considered in similar studies, and proposes a practical framework to manage the COVID-19 pandemic in Saudi Arabia where there are no published studies on this subject [6-24,32-39]. The importance of this study lies in the fact that it is the first investigation carried out in Saudi Arabia in order to propose a qualitative general framework to manage the COVID-19 pandemic based on the opinions of healthcare practitioners in this country. Taking into account the proposals presented in this study, the Saudi Arabian government can implement an effective plan in hospitals to control the spread of the COVID-19 pandemic in the Kingdom of Saudi Arabia.

2. Methods

2.1. Study settings

To achieve the objective of this study, an online questionnaire-based survey was designed to collect data on the attitudes of Saudi Arabian healthcare practitioners towards the treatment of COVID-19 patients, work planning of practitioners, leadership strategies for handling the COVID-19 pandemic, information sharing methodologies, medical errors and procedural compliance, and challenges faced by the practitioners in dealing with the COVID-19 outbreak.

The questionnaire was translated into Arabic by two professional translators, and the survey was developed using the QuestionPro application. The survey was distributed to participants through social media and emails. Practitioners were from seven hospitals including Saudi German Hospital, King Abdullah Medical Complex and Abdul Latif Jameel Hospital in Jeddah, King Fahad Hospital in Medina Munawwarah, King Faisal Specialist Hospital, Prince Mohammad Bin Abdulaziz Hospital, and King Fahad Medical City in Riyadh. These hospitals were state-owned and implemented standard protocols and procedures for the treatment of COVID-19 patients during the pandemic. The approval to carry out this study was given by the Imam Abdulrahman Bin Faisal University, Saudi Arabia.
2.2. Description of the questionnaire

The questionnaire consisted of 7 sections that included closed and multiple choice questions or items. Each item was rated using the 5-point Likert scale: 1. Strongly disagree; 2. Disagree; 3. Neutral; 4. Agree; 5. Strongly agree [40]. The questionnaire is shown in Appendix A.

The first section of the questionnaire consisted of 6 items aimed at obtaining the demographic information of the participants (age, gender, education level, profession, work experience).

The second section had 12 questions focusing on the attitudes of the healthcare practitioners towards the treatment of patients and work activities (Please rate the following items using the Lickert scale: prescribing should take into account patients’ expectations of treatment; physicians and patients should agree on a treatment plan that takes into account their views; physicians should try to help patients to make the most informed decision possible about the benefits and risks of alternative treatments; it is sometimes appropriate for the physician to make treatment decisions without the patient’s input; it is not always necessary for physicians to take into account patients’ priorities; I am happy with my working situation; I am happy to treat old-aged patients; I would be happier in my job if I had to work fewer night shifts; I would like to reduce my average working hours; I would like to work fewer night shifts; I have no objection for working in ICUs allocated for COVID-19; my work life balance is good).

The third section contained 6 items related to leadership management approaches for handling the crisis (Please rate the following statements using the Likert scale: errors are a sign of incompetence; procedures and policies are strictly followed in our department; human error is inevitable; team members frequently disregard rules or guidelines developed for our department such as hand washing, treatment protocols/clinical pathways, and sterile field; I rarely witness an error where one or more team members lack the knowledge to perform the needed action; medical errors are discussed to prevent recurrence).

The fourth section consisted of 7 items related to information sharing (Please rate the following statements using the Likert scale: a regular debriefing of procedures and decisions after a session or shift is an important part of developing and maintaining effective team coordination; team members in charge should verbalize plans for procedures or actions and should be sure that the information is understood and acknowledged by others; I am encouraged by my leaders and co-workers to report any incidents I may observe; it is better to agree with other medical team members than to voice a different opinion; the physician’s responsibilities include coordination between his or her work team and other support teams; medical team members share responsibilities for prioritizing activities in high workload situations; all members of the medical team are qualified to give me feedback).

The fifth section consisted of 6 items related to error/procedural compliance (Please rate the following statements using the Likert scale: errors are a sign of incompetence; procedures and policies are strictly followed in our department; human error is inevitable; team members frequently disregard rules or guidelines developed for our department such as hand washing, treatment protocols/clinical pathways, and sterile field; I rarely witness an error where one or more team members lack the knowledge to perform the needed action; medical errors are discussed to prevent recurrence).

The sixth section included 12 questions about the existence of several challenges (Please rate the following statements using the Likert scale: work overload; poor salary; fewer staff; poor organizational culture; poor leadership; limited or no access to technology; lack of training; lack of healthcare resources such as ventilators/accessories, gloves, masks etc.; lack of sufficient financial resources; lack of support from government; lack of support from community/people; poor operational framework for managing pandemic).

Finally, the seventh section comprised 5 statements related to the importance of developing a healthcare framework for the management of the COVID-19 pandemic (Please rate the following statements using the Likert scale: highly important; important; neutral; not important; not necessary).
Table 1

| Items | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|-------|----------------|-------|---------|----------|-------------------|
| Prescribing should take into account patients’ expectations of treatment | 21.57% | 55.88% | 13.73% | 5.88% | 2.94% |
| Physicians and patients should agree a treatment plan that takes into account their views | 35.29% | 47.06% | 9.80% | 5.88% | 1.96% |
| Physicians should try to help patients to make as informed as possible the benefits and risks of alternative treatments | 37.25% | 47.06% | 9.80% | 1.96% | 3.92% |
| It is sometimes appropriate for the physician to make treatment decisions without the patient’s input | 22.55% | 37.25% | 14.71% | 14.71% | 10.78% |
| It is not always necessary for physicians to take into account patients’ priorities | 24.51% | 38.24% | 3.92% | 21.57% | 11.76% |
| I am happy with my working situation | 31.37% | 47.06% | 12.75% | 3.92% | 4.90% |
| I am happy to treat old-aged patients | 36.46% | 31.24% | 6.91% | 18.21% | 10.18% |
| I would be happier in my job if I had to work fewer night shifts | 27.45% | 41.18% | 22.55% | 3.92% | 4.90% |
| I would like to reduce my average working hours | 30.39% | 41.18% | 20.59% | 3.92% | 3.92% |
| I would like to work fewer night shifts | 26.47% | 38.24% | 23.53% | 3.92% | 7.84% |
| I have no objection for working in ICUs allocated for COVID | 21.57% | 46.08% | 16.67% | 6.86% | 8.82% |
| My work life balance is good | 26.47% | 46.08% | 17.65% | 6.86% | 2.94% |

2.3. Data collection

Considering the objective and characteristics of this study, a purposive sampling method was adopted to collect the data [41]. The survey link was initially sent to 336 healthcare practitioners working in the 7 selected hospitals mentioned above using WhatsApp, Twitter, Facebook, and emails. Only 102 practitioners completed the survey. 80 of them did not start the survey and 154 sent incomplete responses. The response rate was 30.4%. The low response rate may be due to the fact that healthcare practitioners were very busy dealing with the COVID-19 outbreak. The survey was conducted for a period of four weeks, between March 23 and April 12, 2020.

2.4. Validity and reliability of the questionnaire

The questionnaire was validated through a pilot study conducted with nine healthcare practitioners (six nurses, 2 managers and 1 physician). Based on feedback from participants, some changes were made to the questions’ formulations, and the grammatical errors in Arabic were addressed. In addition, the Cronbach’s alpha for all items of the questionnaire were estimated to evaluate its reliability; the Cronbach’s alpha of all items were greater than 0.83 (> 0.70); this revealed good consistency [42].

2.5. Statistical analysis

The relative frequencies and the Cronbach’s alpha for each item of the questionnaire was estimated using basic descriptive statistics. Tables and Figures were used to represent the data.

3. Results

The demographic information of the participants is shown in Fig. 1. This table indicates that 62.8% of the participants were female and 37.2% were male. Considering the age groups, most of the participants (95.0%) were between 25 and 54 years old, and the rest of the participants were between 18 and 24 years old, or were older than 54 years. Focusing on the educational level, 41.2% of the participants had a master’s degree, 27.5% of them were Ph.D., 21.6% were Bachelor’s degree holders, 5.9% were Diploma holders, and 3.9% had other educational qualifications. The professions of the participants were diverse. Of these, 28.4% were nurses, 23.5% senior physicians, 12.7% assistant physicians, 10.8% consultants or chief physicians or medical students, 8.8% pharmacists or administrators, and the rest of the participants had other medical professions. Regarding the experience of the participants, most of them (56.9%) had a work experience of more than ten years, followed by 30.4% who had six to ten years of work experience, and other participants had less than 5 years of experience.

Table 1 presents the frequency distribution of various aspects related to healthcare practitioners’ attitudes towards patient treatment and working conditions during the COVID-19 outbreak. This table shows that more than 70% (21.57% strongly agreed and 55.88% agreed) of the participants preferred that the prescription process should take into account the patient’s treatment expectations. Likewise, 82.35% (35.29% strongly agreed and 47.06% agreed) of the respondents considered that the treatment should take into account the opinions of both doctors and patients. One of the important aspects in treating COVID-19 includes the risks associated with it. In this context, the majority of the participants stated that patients should be informed about the benefits and risks of treatment. Next, 59.8% of the participants strongly agreed or agreed that it was appropriate to take treatment decisions without informing patients. However, there were a considerable number of participants (25.49%) who opposed the approach (disagreed or strongly disagreed), and 14.71% were neutral. Similar results were observed with regard to considerations of patients’ priorities. Furthermore, Table 1 reveals that most of the participants were happy with their working conditions; however, they preferred to reduce their working hours, particularly the night shifts. Similarly, most of them have no objection on working in ICUs, where severely affected COVID-19 patients were treated; nevertheless, a significant number of participants (15.68%) stated they had objections, while 16.67% of them took neutral position.

In relation to various management approaches for handling the COVID-19 crisis in hospitals, Fig. 2 shows a summary of some key approaches and the participants’ opinions about these methods. Most of the participants thought (38.24% strongly agreed and 45.10% agreed) that senior staff should encourage questions from junior staff, as the COVID-19 is a new infection, and the details of symptoms and treatment approaches and the participants’ opinions about these methods. Most of the participants thought (38.24% strongly agreed and 45.10% agreed) that senior staff should encourage questions from junior staff, as the COVID-19 is a new infection, and the details of symptoms and treatment procedures are different from other viral diseases. Also, the majority of them stated that they relied on their superiors’ advice in critical situations. In relation to juniors assuming control of treatment and care, more than half of the respondents (22.55% strongly agreed and 32.35% agreed) opposed the idea of juniors taking control, while a considerable number of participants (18.63% disagreed and 6.86% strongly disagreed) considered that juniors may assume control. In addition, the majority of the participants preferred that leadership be in medical staff
members. However, 66, 67% of the participants (agreed and strongly agreed) stated that they feel uncomfortable in telling team members from other disciplines to take some action.

Table 2 displays the results of the participants’ opinions regarding information sharing approaches. Most participants suggested that methodologies such as regular debriefing, verbalizing plans and actions related to treatment and procedures, regular reporting of incidents, and team member coordination were important information approaches. However, the majority of participants pointed out that it is better to agree with other team members than to express a different opinion. Moreover, the respondents observed that the need for support and collaboration among team members were important approaches for prioritizing activities in high workload situations.

The perceptions of participants regarding errors and procedural compliance are presented in Fig. 3. The results indicated that most of participants pointed out that errors were a sign of incompetence, and that human errors were inevitable. However, these risks can be effectively addressed by adopting strict policies and regulations in the workplace. In this context, more than 70% of the respondents (20.59% strongly agreed and 40.20% agreed) observed that team members frequently disregarded rules or guidelines (hand washing, prioritizing activities in high workload situations).

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The findings indicated that physicians should consider the expectations and views of patients regarding the treatment offered for the COVID-19 pandemic. As COVID-19 is caused by a novel coronavirus, and a vaccine has not yet been discovered [43], it may not be possible to consider patients’ opinions and expectations about their treatment. However, patients must be fully informed about the benefits and risks of the available treatment and off-label medications, which are prescribed by the World Health Organization (WHO) [43]. In this context, the majority of participants have stated that it is sometimes appropriate to make treatment decisions without patients’ opinions, considering the safety of patients and others, and the fact that patients may transmit the disease to others without knowing that they are infected [44]. The large number of elderly patients who were affected with COVID-19 may be a cause for concern, as few healthcare practitioners with COVID-19 infection. Furthermore, based on the attitudes of the healthcare practitioners, a general framework for the management of the COVID-19 pandemic in Saudi Arabia was proposed in this study.

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important observation detected in the survey was related to the possibility that junior team members could take control of treatment, prevention, and care during the crisis. In this regard, due to the rapid increase in COVID-19 cases, a shortage of healthcare practitioners may occur and a situation may arise in which members of the junior team have to make some decisions related to treatment and care. Therefore, it is essential that they are adequately trained and have enough skills to handle the COVID-19 crisis. In these circumstances, the support from all stakeholders including physicians, patients, and members of other disciplines in hospitals is necessary. Regarding this issue, some studies have identified that stakeholders participation and skills training are important approaches to ensuring the preparedness of hospitals in pandemic management [47–51]. In this sense, the training and skills development of healthcare practitioners is a crucial aspect required in any general framework for managing the COVID-19 outbreak in Saudi Arabia.

The outcomes regarding errors and compliance with procedures reflected that human errors are inevitable, but can be addressed by adopting strict policies, measures, and methods in hospitals. One of the main causes of concerns was that more than 60% of the participants have stated that their team members frequently disregard rules and guidelines (hand washing, treatment protocols/clinical pathways, sterile field, etc.), which may result in serious damages and can become a source of spreading the infection. Consequently, it was assessed that operational and human errors can result in serious damages if not properly addressed [52,53], and there is a need for strict guidelines such as isolation, quarantine, border control, social-distancing, sanitation, etc., for controlling the spread of the COVID-19 [54]. This can be achieved by improving stakeholder participation, effective leadership, frequent training, and skills enhancement [48–50]. It is also important to protect healthcare practitioners working in hospitals, and steps must be taken to enforce an effective and supportive organizational culture with strict procedures and compliances, which makes effective and efficient use of resources, and develops operative strategies to improve the efficiency and effectiveness of healthcare operations [55,56]. Therefore, the implementation of strict procedures to control the spread of the COVID-19 infection is an issue that must be taken into account in the operation of a framework for managing the COVID-19 pandemic.

A regular debriefing of procedures and decisions after a session or shift is an important part of developing and maintaining effective team coordination and leadership. In addition, incident reporting, team coordination through effective communications, stakeholders feedback, and sharing of responsibilities are important factors in relation to information management, reviews, and situation monitoring. Previous studies [57–60] have indicated the importance of effective communication not only in the management of healthcare operations, but also among the public population in taking a preventative attitude against infectious diseases and pandemics. Therefore, the effective share of information is crucial for frequent reviews of strategies, procedures and guidelines, since the pathogen causing the disease is new, and its impact, symptoms, and means of infection can be revealed over time from the observation of affected patients. Another feature implemented in the COVID-19 pandemic management framework was to develop and maintain effective team coordination through information sharing among the healthcare practitioners.

Participants also expressed that they faced several challenges due to the lack of medical equipment and resources, and a lack of support from the government and communities. Hence, another aspect included in the framework was maintaining an adequate supply of medicines and medical equipment, and obtaining the support of the government, communities, and people.

Based on the previous analysis, it is possible to suggest the implementation of a general qualitative framework for managing the COVID-19 crisis in Saudi Arabian hospitals. As shown in Fig. 5, the framework consists of 5 interrelated operations.

Table 2: Frequency distribution of healthcare practitioners’ information sharing approaches (n = 102).

| Items                                                                 | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|----------------------------------------------------------------------|----------------|-------|---------|----------|-------------------|
| A regular debriefing of procedures and decisions after a session or shift is an important part of developing and maintaining effective team coordination | 39.22%         | 40.20%| 13.73%  | 2.94%    | 3.92%             |
| Team members in charge should verbalize plans for procedures or actions and should be sure that the information is understood and acknowledged by others | 44.12%         | 38.24%| 9.80%   | 6.86%    | 0.98%             |
| I am encouraged by my leaders and co-workers to report any incidents I may observe | 35.29%         | 49.02%| 8.82%   | 3.92%    | 2.94%             |
| It is better to agree with other medical team members than to voice a different opinion | 22.55%         | 40.20%| 12.75%  | 15.69%   | 8.82%             |
| The physician’s responsibilities include coordination between his or her work team and other support teams | 35.29%         | 49.02%| 5.88%   | 5.88%    | 3.92%             |
| Medical team members share responsibilities for prioritizing activities in high workload situations | 33.33%         | 51.96%| 10.78%  | 2.94%    | 0.98%             |
| All members of the medical team are qualified to give me feedback | 30.39%         | 44.12%| 11.76%  | 10.78%   | 2.94%             |

reduced working hours and fewer night shifts; this might not be possible considering the current situation with limited healthcare resources and a rapidly increasing number of patients [46]. In addition, the respondents thought that work overload was a major challenge faced by healthcare practitioners in Saudi Arabia. These findings indicated that workforce and healthcare organization planning is an important factor in providing treatment and care, and must be included in any framework for managing the COVID-19 outbreak.

Also, the respondents suggested that effective leadership, support from senior staff, and collaboration between all teams from different disciplines were crucial factors for handling the COVID-19 crisis [25]. Therefore, this aspect was also incorporated in the framework for managing the COVID-19 outbreak in Saudi Arabia.

On the other hand, the participants thought that lack of training was a challenge faced by healthcare practitioners. About this topic, one important observation detected in the survey was related to the possibility that junior team members could take control of treatment, prevention, and care during the crisis. In this regard, due to the rapid increase in COVID-19 cases, a shortage of healthcare practitioners may occur and a situation may arise in which members of the junior team
Important to consider the development of key indicators to measure the progress of the COVID-19 pandemic, analysis of statistical data about the pandemic, and the development of approaches for the management of healthcare operations.

The second operation for managing the COVID-19 outbreak is related to management and communication between stakeholders such as healthcare practitioners, communities, international organizations, pharmaceutical corporations, research and development organizations, local government (Ministry of Health), among other participants. Effective communication between the stakeholders helps organize containment and treatment procedures to be adopted to control the spread of the COVID-19 pandemic and gain support in achieving and maintaining an inventory of necessary medical resources including medicines, medical equipment, test kits, etc. Similarly, effective communication facilitates cooperation between teams, management of workload, positive attitudes towards patients, sharing of responsibilities, effective leadership, information sharing, and effective operational management of stakeholders.

The third operation considers the organizational and workforce planning that requires the implementation of an organizational culture that uses the available human and material resources efficiently and effectively, and minimizes work overload. The workload management, collaboration between teams, sharing responsibilities, effective leadership, and information sharing across the teams are important aspects to contemplate in the development of a framework to handle the COVID-19 outbreak. Similarly, determining the organizational structure for managing operations, developing policies, procedures, regulations and guidelines to be followed by the healthcare practitioners, adopting risk management strategies, and resource management techniques (efficient and effective use of resources) are also aspects linked to this component.

The fourth operation is related to the management of skills and knowledge among the healthcare practitioners. In this sense, it is necessary to develop an organizational structure that allows the training and acquisition of knowledge and skills of healthcare professionals. It is very important to train healthcare personnel, especially doctors and nurses who are directly involved with patients, regarding the safety procedures, treatment process, and guidelines that must be followed. Also, the implementation of approaches such as regular briefing and debriefing can help increase the knowledge and awareness and facilitate knowledge transfer. In addition, the support from all stakeholders, and

![Fig. 3. Frequency distribution of practitioners’ attitudes towards healthcare errors and procedural compliance (n = 102).](image)

![Table 3](image)

| Items                                              | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|----------------------------------------------------|----------------|-------|---------|----------|------------------|
| Work overload                                      | 17.65%         | 50.98%| 23.53%  | 4.90%    | 2.94%            |
| Poor salary                                        | 20.59%         | 47.06%| 18.63%  | 10.78%   | 2.94%            |
| Insufficient staff                                 | 22.55%         | 55.88%| 14.71%  | 4.90%    | 1.96%            |
| Poor organizational culture                        | 18.63%         | 51.96%| 18.63%  | 7.84%    | 2.94%            |
| Poor leadership                                    | 19.61%         | 47.06%| 17.65%  | 11.76%   | 3.92%            |
| Limited or no access to technology                 | 9.80%          | 47.06%| 18.63%  | 13.73%   | 10.78%           |
| Lack of training                                   | 16.67%         | 51.96%| 14.71%  | 10.78%   | 5.88%            |
| Lack of healthcare resources (devices such as ventilators/ accessories such as gloves, masks etc.) | 17.65%         | 44.12%| 17.65%  | 14.71%   | 5.88%            |
| Lack of sufficient financial resources             | 12.75%         | 49.02%| 18.63%  | 12.75%   | 6.86%            |
| Lack of support from government                    | 9.80%          | 46.08%| 16.67%  | 15.69%   | 11.76%           |
| Lack of support from community/people              | 14.71%         | 53.92%| 17.65%  | 10.78%   | 2.94%            |
| Poor operational framework for managing pandemic   | 12.75%         | 51.96%| 15.69%  | 13.73%   | 5.88%            |

![Fig. 4. Opinion of healthcare practitioners on a framework for healthcare operation (n = 102).](image)
especially hospital management staff and co-workers, is essential to motivate healthcare personnel in developing positive attitudes towards acquisition of skills and knowledge in their work environment.

Finally, the fifth operation aims to evaluate the effectiveness of the strategies implemented to manage the Covid-19 pandemic. In this regard, through key indicators, it is observed if the applied strategies adequately controlled the pandemic. If a positive result (Yes) is observed, the strategies are maintained, but if the results are negative (No), the strategies are changed or modified by other alternatives. The main key indicator is the number of cases of new infected people and deaths caused by the COVID-19 virus after implementing the strategies. The best strategy would be the one that makes this number remain constant at a value close to or equal to zero.

The main limitations of this study were the small sample size of participants and the fact that an intentional sampling method was used in 7 hospitals in Saudi Arabia. Therefore, the results of this research cannot be generalized to all hospitals in Saudi Arabia. Future studies should be aimed at including most of the Saudi Arabian hospitals.
5. Conclusion

The healthcare practitioners’ attitudes towards the COVID-19 outbreak in Saudi Arabia suggested that healthcare professionals thought that effective communication and interaction between healthcare professionals and patients, workplace planning, health care organization, cooperation and communication between team members, and leadership were essential factors for handling the COVID-19 pandemic. Similarly, healthcare practitioners believed that training and skills development of health professionals, implementation of strict procedures to avoid medical errors, maintaining an adequate supply of medicines and medical equipment, and obtaining support from the government, the community, and people were imperative measures to control the spread of the COVID-19 pandemic.

In summary, planning and developing strategies for handling the COVID-19 pandemic, management and communication between stakeholders, organizational and workforce planning, skills and knowledge management, and evaluation were the main components of the general qualitative framework proposed in this study for managing the COVID-19 outbreak in Saudi Arabia. The propositions presented in this study can help the Saudi Arabian government implement an effective plan to control the spread of the COVID-19 pandemic in this country.

Conflicts of interest

There is no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.imu.2020.100491.

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