

## Impact of COVID-19 pandemic on healthcare management in Hafar Al Batin Central Hospital: The experience and the potential future threats

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### Abstract

The reality that the KSA healthcare system was unable to control the virus's spread and the associated mortality rate created several managerial and clinical challenges for the industry. This emphasizes the necessity of setting up efficient and useful guidelines, policies, and processes in healthcare systems to prepare for crisis management during a pandemic like covid-19. The study aims to identify effective, resilient, health policies to fight against health crises and some changes accrued in health management and services in the healthcare sector and to determine the effects of the covid 19 pandemic in the Kingdom of Saudi Arabia the study utilizes a cross-sectional method on 500 health care employee on Hafar Al Batin Central Hospital the result shown challenges that affected the healthcare management team on personal and hospital levels the most important healthcare management input that was unavailable during the pandemic was the level of preparedness for covid-19 and future health emergencies Strategic measures are being taken to minimize the spread of covid-19 Changes that have occurred in Saudi Arabia's healthcare institutions in preparation for future health emergencies introducing different health and safety measures, processes, and procedures. However, managing the number of infections and deaths reported within the country was still a significant challenge identifying key challenges and difficulties faced by healthcare managers in preventing the further spread of the virus and protecting the uninfected patients and the healthcare workers in KSA, identifying. The study will also contribute to the existing literature as it has identified key strategies and policies that have been put in place by healthcare institutions in preparation for future pandemics and health emergencies.

**Keywords:** COVID-19 Pandemic, healthcare system, health crises.

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## INTRODUCTION

Towards the end of 2019, an infectious disease, known as the Corona Virus (COVID- 19) was reported in Wuhan City in China. In 2020, the disease spread widely across the world, causing panic, uncertainty, and devastation to everyone worldwide. To this end, the World Health Organization (WHO) announced an international public health emergency on January, 30<sup>th</sup>, 2020 before declaring COVID-19 a global pandemic on March, 11<sup>th</sup>, 2020 (Tengilimoğlu *et al.*, 2021). Since then, the number of infected people rose uncontrollably reaching 2.5 million by June 10<sup>th</sup>, 2020. The pandemic put immense pressure particularly on the

global healthcare system as numerous healthcare organizations across the world either cancelled or stopped elective procedures in their cardiac catheterization Labs. This backlog in the elective procedures undoubtedly led to a suspension of patient care, especially for those with severe aortic stenosis, which placed them at higher risk for cardiovascular complications such as heart failure and sudden death (Tengilimoğlu *et al.*, 2021). Additionally, barriers imposed by preventive measures such as curfews, restricted movement, and stay-at-home orders prevented some patients from going for their appointments, while others avoided health centres and

hospitals for fear of being infected. Besides, Health Care Workers (HCW) was faced with tremendous pressure and uncertainty because they were expected to work towards minimizing the spread of the virus by performing certain procedures on COVID-19 patients, making the whole situation extremely challenging for their safety (Balghith, 2020).

Just like any other country, the kingdom of Saudi Arabia (KSA) encountered various challenges during the COVID-19 pandemic. However, it was able to set some measures in place to minimize the impact of the disease. Some of the protective measures implemented by KSA include establishing COVID-19 healthcare centres, providing free COVID-19 treatment and healthcare to all, setting apart fever clinics in all cities, and setting up both public and private hospitals to handle COVID-19 (Balghith, 2020). Also, healthcare organizations began preparing to manage the surge in the number of reported cases, while trying to protect healthcare workers and other uninfected patients. Although unprecedented, these alternative ways of dealing with, and protecting patients and healthcare workers were critical. Despite these efforts, approximately 70,000 cases were reported in the first six months of the health crisis, and the country lost almost 10,000 lives by June 2021 (Balghith, 2020).

KSA's healthcare systems responded to the pandemic immediately by introducing different health and safety measures and procedures, but some healthcare systems still struggled to manage the number of infections and deaths reported within the country. According to Öncü *et al.*, (2021), risk and crisis management is the cornerstone of any industry or sector whenever urgent and unprecedented decisions need to be made. The healthcare sector is no exception in the sense that healthcare managers are responsible for coordinating risk management activities and procedures in conjunction with other healthcare staff members to assist in decision-making during a crisis (Yahia, 2020). The fact that the healthcare system in KSA was unable to effectively manage the spread of the virus and the mortality rate associated with the same presented various healthcare managerial challenges and clinical difficulties. This highlights the need for healthcare systems to have effective and practical guidelines, policies, and processes put in place in preparation for crisis management during a pandemic such as COVID-19.

#### • **Statement of the Problem**

Although KSA's healthcare systems responded to the pandemic immediately by introducing different health and safety measures, processes, and procedures, it still struggled to manage the number of infections and deaths reported within the country. The existing literature shows that the global healthcare system was unable to effectively manage the spread of the virus and the mortality rate associated with the health crisis,

which raised major concerns regarding the effectiveness of global healthcare system management (Yahia, 2020; Tengilimoğlu *et al.*, 2021). Investigating the impact of COVID-19 on healthcare management at Hafar Al Batin Central Hospital contribute to this literature by identifying key challenges and difficulties faced by healthcare managers in preventing the further spread of the virus, and protecting the uninfected patients healthcare workers on Hafar Al Batin Central Hospital workers in KSA. Also, the research will help in identifying the need for healthcare systems to have effective and practical guidelines, policies, and processes put in place in preparation for crisis management during a pandemic such as COVID-19 in the future.

#### • **The Significance of the Study**

The significance of this study is to identify the effect of the COVID-19 pandemic on healthcare management at Hafar Al Batin Central Hospital in KSA. Some studies have previously tried to investigate this issue, but most of them have been limited in scale and scope, as they have fundamentally covered only the first few months of the pandemic, small geographic areas or only certain types of healthcare. In this view, the current study aims at investigating the impact of the pandemic on a broader scale by identifying how the decisions of healthcare managers and leaders in both private and public health institutions were influenced by the pandemic in the first few months as well as in the long run. This knowledge is essential as it will establish the basis on which healthcare managers will design and implement policies and procedures for risk mitigation in the future when faced with unprecedented situations such as the COVID-19 pandemic.

#### • **Research Questions**

The current research will answer the following research questions:

1. What effect did the COVID-19 pandemic have on routine healthcare management practices at Hafar Al Batin Central Hospital?
2. Which health policies did Hafar Al Batin Central Hospital have in place to fight against health crises such as COVID-19?
3. What kind of changes has occurred in health management and services at Hafar Al Batin Central Hospital during the COVID-19 pandemic?

#### • **THE OBJECTIVES OF THE STUDY**

Given the likelihood of future pandemics and other major shocks, there is an urgent need to design and implement more resilient and efficient healthcare systems capable of addressing a crisis while maintaining the management of essential functions. As such, the objectives of the current study are as follows:

1. To identify how effective and resilient the KSA's healthcare sector in Hafar Al Batin Central Hospital was before the COVID-19 pandemic.

2. To determine the effects of the COVID-19 pandemic on healthcare management practices at Hafar Al Batin Central Hospital
3. To identify health policies that Hafar Al Batin Central Hospital had in place to fight against health crises such as the COVID-19
4. To identify some of the changes that have occurred in health management and services in Hafar Al Batin Central Hospital during the COVID-19 pandemic and how they will help the nation's healthcare plans in the future.

## • LITERATURE REVIEW

The COVID-19 pandemic is a compelling reminder that the world is highly complex and unpredictable. For healthcare delivery institutions, the pandemic tested their resilience as an effective response necessitated a swift shift from most conventional healthcare practices to effectively manage the wide array of acute challenges it presented (Yahia, 2020). Some of the most notable challenges presented by the COVID-19 pandemic included shortages in the supply of personal protective equipment (PPE), inadequate capacity, the need to redesign care, financial losses and adjusting the capacity of the workforce to work around the new budget. According to Parveen (2020), healthcare delivery institutions are complex robust systems operating in extremely high complex and erratic environments, thus it is difficult to standardize or control them. Nonetheless, healthcare leaders, managers, and administrators had to adapt to the changes by transforming their organizations to deliver quality services even amid the pandemic.

Particularly, KSA's healthcare systems were significantly affected by the COVID-19 pandemic, and management teams responded immediately by implementing different health and safety measures, processes, and procedures (Tengilimoğlu *et al.*, 2021). However, the teams still struggled to manage the number of infections and deaths reported within the country. To this end, this literature review aims at examining the impact of COVID-19 on healthcare management in KSA as well as coming up with effective measures and guidelines for resilient and efficient healthcare management systems capable of addressing future health crises while maintaining the management of essential functions.

The COVID-19 pandemic demonstrates that an independent and unprecedented event in one part of the globe can have an immense impact on the routine operations of healthcare institutions and medical practices worldwide. In their research, Balghith (2020) define an unprecedented event as one that is characterized by three key dimensions: the speed of spread, the complex nature of its source, and the unpredictability of its magnitude and impact. They argue that health crises such as COVID-19, as well as events caused by terrorism, and environmental disasters

present the greatest challenges because they have the most complex etiologies, the fastest spread, and the most unpredictable magnitude. For instance, the accurate source of COVID-19 remains unknown, yet its massive and rapid spread was unprecedented in the sense that over one million people lost their lives across the world only a month after the first case was reported in Wuhan, China (Balghith, 2020). As a result, healthcare management systems faced a myriad of substantial management challenges during this period. Similar research conducted by Öncü *et al.*, (2021) on the extent to which the COVID-19 pandemic impacted healthcare management systems across the world shows that the unprecedented nature of the virus imposed significant uncertain challenges and threats for healthcare management systems across the world, which exerted a negative impact on the relevance of public health. As a result, governments, policymakers and other concerned parties are laying more emphasis on establishing more effective healthcare management models and the need to adhere to them.

Just like in any other country, the COVID-19 pandemic erupted in KSA as an isolated incident in March 2020 when the first victim returned to the country from Iran. What started as an isolated case rapidly became a national public health issue within the first few weeks, reaching 1642 cases by the end of March. According to Traiki *et al.*, (2020), healthcare institutions are expected to implement certain guidelines and measures to manage a crisis during a public health emergency such as COVID-19. Although KSA's healthcare systems responded to the pandemic immediately by introducing different health and safety measures, processes, and procedures, it still struggled to manage the number of infections and deaths reported within the country. For this reason, the country faced numerous challenges, which highlighted some weaknesses in KSA's public health system and practices. For instance, cumulative studies show that inadequate capacity to handle the rising number of COVID-19 patients is one of the key challenges faced by Saudi Arabia's healthcare institutions (Traiki *et al.*, 2020; Cullen *et al.*, 2020; Alhodaib & Alanzi, 2021; Yahia, 2020). Particularly, Alhodaib & Alanzi (2021) claim that the government mobilized a team of healthcare providers to deal with the COVID-19 outbreak. The resulting impact of this decision was that it reduced treatment and service in the country's healthcare system because of the surging number of COVID-19 cases and the flow of patients in clinics and hospitals became more than other patients with other medical conditions.

On the same challenge of inadequate capacity to handle rising COVID-19 cases, Alqahtani *et al.*, (2021) claim that the increased demand for intensive care unit (ICU) ventilators and beds, along with the increasing need for extra staff exceeded the maximum capacity in most healthcare institutions in Saudi Arabia.

They evaluated relevant data from Saudi Arabia's National Health Emergency Operation Center to project the ICU and general hospital bed surge capacity in three separate transmission scenarios. Their results showed that KSA's hospitals needed a supply of over 5,000 more beds to accommodate COVID-19-positive cases in the first three months after the outbreak. The urgent need for additional ICU and general hospital beds in KSA in the wake of the pandemic shows that the country needs to have more measures in place to ensure there are adequate bed supplies to ensure KSA's health system is well prepared for future health emergencies. This is because according to Alaama & Jokhdar (2021), pandemics often demonstrate a critical challenge and distinct threat to the healthcare system of a country due to an increase in the demand for healthcare services supply, which is likely to overburden the healthcare.

COVID-19 also had a significant impact on healthcare providers in Saudi Arabia. Numerous studies show that there was a shortage of healthcare providers including nurse practitioners and other professionals during the peak of the pandemic between June and July of 2020 due to the increasing demand by COVID-19 patients in KSA (Al Sulais *et al.*, 2020; Alaama & Jokhdar, 2021; Alwaqadani *et al.*, 2021; Balghith, 2020). Additionally, there was a shortage of healthcare workers as some of them were affected by the outbreak. Also, a lot of absenteeism was reported as some healthcare workers feared for their safety, while others found it difficult to sustain their regular operations due to the increased workflow and lack of morale. Essentially, the COVID-19 pandemic exposed healthcare workers to extraordinary stress and made them vulnerable to various types of psychological illnesses (Alwaqadani *et al.*, 2021). In particular, research conducted by Al Sulais *et al.*, (2020) to investigate the impact of the COVID-19 pandemic on the mental well-being of physicians in Saudi Arabia, the findings revealed that the pandemic exposed them to immense stress, which made them susceptible to different psychological issues including anxiety and depression. The authors performed a cross-sectional survey, whereby questionnaires were issued to physicians in Saudi Arabia to gauge their understanding regarding the rationale for quarantine, quarantine behaviours including compliance and difficulties, and the resulting psychological impacts of the same. This survey revealed that physicians in KSA experienced a series of emotions as a result of the pandemic including worry, isolation, and fear. Similarly, a narrative review conducted by Alwaqadani *et al.*, (2021) to outline the psychological effects of the COVID-19 pandemic on healthcare workers in KSA showed that the pandemic led to vigorous and multifaceted mental and psychological effects on healthcare providers. These findings expose a weakness in the healthcare management system, which is supposed to improve service delivery by improving the mental infrastructure to fortify patient-centred care and treatment.

Additionally, the COVID-19 pandemic created unprecedented leadership and management issues for healthcare administrators including confronting the financial crisis, managing a remote team, and planning for readiness. After the emergence of the COVID-19 pandemic, healthcare institutions across the world started focusing on the preparation for and management of the rapidly increasing infection cases while simultaneously protecting other patients and their healthcare providers from contracting the disease (Öncü *et al.*, 2021). Reshaping the way people work necessitates creative and innovative approaches as well as cross-examining conventional medical practices. According to Öncü *et al.*, (2021), the greatest impact of the COVID-19 pandemic is that it highlighted the need to re-engineer the way healthcare institutions deliver care to prepare for future calamities. To back this information up, another study conducted by Balghith (2020) to examine the impact of COVID-19 on healthcare administrators in Saudi Arabia showed that the pandemic caused a historic increase in financial expenses and losses due to various reasons including cancelled elective inpatient and outpatient surgeries due to social distancing and quarantine control measures, elective physician visits, increased budget due to increased demand of supplies such as the personal protective equipment (PPE) for healthcare workers, hand sanitisers, toilet paper, hospital equipment, and water. Remediating the financial crisis caused by the pandemic became a fundamental role of healthcare administrators and leaders. Some of the strategies adopted by healthcare administrators in Saudi Arabia to manage the financial crisis caused by the pandemic include minimizing the workforce by laying off some of them or introducing remote working. According to Balghith (2020) transitioning healthcare staff from working from the office to working remotely using telehealth technologies and facilitating business continuity was necessary and urgent steps for healthcare administrators in their effort to alleviate the impacts of the COVID-19 pandemic.

Whenever a health emergency such as COVID-19 occurs, the entire healthcare system is required to respond swiftly to prevent or manage the effects of the disease, its morbidities, and mortalities. According to Aleaniz & Alqahtani (2022) hospital preparedness and resilience play an essential role in the continuous effort to alleviate the catastrophic effects of the COVID-19 pandemic as well as to minimize its spread. Hospital preparedness refers to the prevention, monitoring, management, containment, and identification of individuals exposed to a disease, or those already infected through the implementation of facility measures. Some of these measures include training healthcare workers on various prevention and management protocols, fast identification of exposed and infected persons, and isolation of suspected and confirmed COVID-19 patients; transmission-based precaution using appropriate personal protective

equipment (PPE); basic hygiene; and environmental cleaning and hygiene. On the other hand, resilience refers to the ability of a healthcare management system to go through adverse situations but manage to remain focused on the future. This attribute is essential for healthcare personnel, who are constantly faced with competing priorities within a complex and uncertain healthcare system. In light of this, several studies have been conducted to examine how well different countries were prepared to fight against a health crisis such as COVID-19.

In the case of Saudi Arabia, Alonazi & Altuwaijri (2021) conducted research aimed at investigating the hospital preparedness, resilience, and psychological burden of clinical nurses in confronting the COVID-19 crisis in Riyadh, Saudi Arabia. The findings of the study show that clinical nurses in the Riyadh hospitals assessed have a high perception regarding hospital preparedness and resilience, which is an implication that the healthcare management system is effectively playing its role in preventing and managing health emergencies such as COVID-19. The results also revealed that the assessed hospitals were following the implemented guidelines and policies established by the WHO to manage the pandemic as well as ensure that hospital staff and visitors are well protected. In a corresponding cross-sectional study conducted by Aleaniz & Alqahtani (2022) to evaluate the preparedness of Saudi Arabia's healthcare facilities regarding handling the COVID-19 pandemic, the results revealed that most of the healthcare workers in the country had exceptional know knowledge and understanding of risk management plans and crisis sub plans of infection management and prevention principles, procedures, and policies. As such, KSA's healthcare managers and leaders were able to better mitigate the spread of the virus in comparison to other countries.

## • RESEARCH METHODOLOGY

The current study will employ a cross-sectional, hospital-based survey conducted at Hafar Al Batin Central Hospital. A total of 500 healthcare workers from these hospitals – will be invited to participate in the study by completing an online questionnaire between 4<sup>th</sup> December and 6<sup>th</sup> December 2022. This is a convenience sample from two hospitals that were designated to provide healthcare services to high-risk COVID-19 patients. The study will also utilize a qualitative research model by using open-access data based on General Authority for Statistics in KSA and the Kingdom of Saudi Arabia Ministry of Health. The acquired data will then be analyzed using Qualitative Content Analysis, which represents a systematic means of reporting and explaining phenomena by creating, categories, tables, themes, models etc. Qualitative research models are very popular in the field of health sciences, particularly; complex issues and new phenomena are investigated

using qualitative models in general. In this study, the two methods will be used to examine KSA's healthcare management during the pandemic, the changes that occurred in health management and services during the COVID-19 pandemic, and how these changes will impact the entire healthcare system in the occurrence of any health crises in the future. This study will provide tables and figures and emerging themes to understand the effect of the COVID-19 pandemic on health management in the Kingdom of Saudi Arabia.

### The Questionnaire

Q1. What is your gender?

- Male.
- Female.
- Other.
- Prefer not to specify.

Q2. How old are you?

- Less than 25.
- Between 25-40.
- More than 40.

Q3. What is your Specialty in healthcare?

- Anaesthesia.
- Palliative Medicine.
- Radiation Oncology.
- Medical Oncology.
- Surgical Oncology.

Q4. How many years of experience do you have within your speciality?

- Between 1 to 3 years.
- Between 3 to 5 years.
- Between 5 to 10 years.
- Above 10 years.

Q5. Based on your experience and expertise, which one of these challenges did you feel most affected you on a hospital level during the COVID-19 pandemic?

- Inadequate screening for potential COVID-19 patients.
- Limited healthcare facilities to attend to COVID-19 patients.
- Limited inpatient and outpatient services.
- Lack of pharmacy dispensing wings to ease access for patients in need of certain medications.
- Limited staff, which left many patients with moderate and mild symptoms unattended to.

Q6. Which of the following challenges did you face most on a personal level during the COVID-19 pandemic?

- Transportation to and from the hospital.
- Fear of trauma caused by stigmatization and discrimination from the society.
- Fear of infecting your loved ones at home.

- d) Limited access to information regarding the guidelines established by the government regarding COVID-19.
- e) Difficulty convincing patients with mild symptoms to stay at home and observe the guidelines established instead of flooding the hospitals.
- f) Maintaining the right level of hygiene, especially in your daily interactions with patients and colleagues.

Q7. Which healthcare management inputs did you observe as most needed and unavailable during the COVID-19 pandemic?

- a) Planning and coordination of equipment, medication, hospital space, infrastructure, and specialized services.
- b) Management of budget and work schedule.
- c) The oversight of individual departments ensures that they are run smoothly and effectively.
- d) Quality assurance and risk assessment work, maintaining patient satisfaction and well-being.
- e) Supervision all staff, including caregivers, doctors and providers and ensure their safety.

Q8. To what extent were the information technology systems suitable for pandemic preparedness and emergency response?

- a) To a great extent.
- b) To some extent.
- c) To a certain extent.

Q9. What type of solutions might a prepared healthcare system require for future emergencies?

Enabling a wide range of enabling factors such as adequate equipment, financing, skilled staff, effective information systems, and efficient management and operational protocols.

- a) Contingency planning for individual healthcare facilities: demand, capacity, and readiness for shocks such as skills, staff, equipment, management, supplies, and protocols.
- b) Healthcare systems: strategies to increase surge capacity and coordination.
- c) Integrated emergency response: coordination with disaster response and civil protection agencies.
- d) Quality infrastructure for resilient healthcare services.
- e) All of the above.

Q10. To what extent did the healthcare system engage in strategic behaviour such as joint procurement and capacity sharing?

- a) To a great extent.
- b) To some extent.

Q11. Which of these strategic measures were highly observed in your healthcare institution?

- a) Providing the necessary PPE equipment such as face masks and sanitisers.
- b) Paid leave for some proportion of healthcare staff.
- c) Triage system to identify patients in need of specialized care during the pandemic.
- d) Utilizing NGO services established to assist critical COVID-19 cases.
- e) Advanced care planning and management for patients admitted at the hospital at the time.

Q12. Which of these health policies did you identify in your institution aimed at fighting against health crises or pandemics?

- a) Utilization of digital healthcare strategies such as the use of Social media platforms including Twitter and Google Trends analyses to model pandemic trends.
- b) Suitable information technology systems for pandemics preparedness and emergency response.
- c) Availability of adequate, highly trained, and reliable healthcare workers.
- d) Availability of effective surveillance and response systems.
- e) The high degree of flexibility in your jurisdiction to manage the healthcare facility during emergencies? E.g. Are operations decentralized and the responsibility is solely on the healthcare facility; or are they distributed, and healthcare facilities can collaborate or coordinate efforts, capacities, and resources?

Q13. Which of these key changes has since occurred in your organization in readiness for another health pandemic in the future?

- a) Personal Infection Control protocols inside the hospital such as the use of sanitisers and temperature checks.
- b) Video appointments for primary healthcare, mental health-related issues and post-hospital discharge.
- c) Proper disposal of hospital wastes.
- d) Shifting high patient numbers towards remote care.
- e) Increased emphasis on digital surveillance systems and data analysis.
- f) Development of political, legislative, and Healthcare Management Systems.
- g) Development and utilization of Technology-Based Approaches to communication.

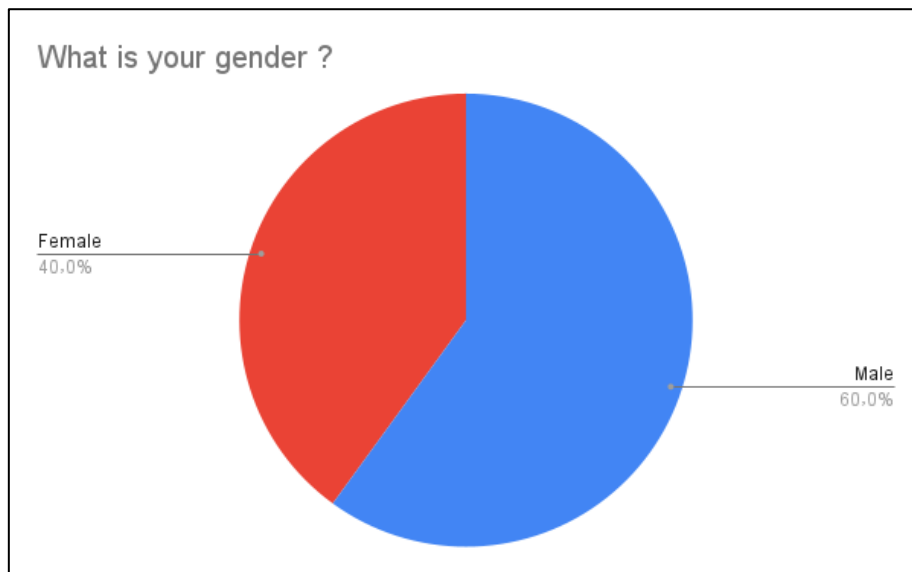
## • RESULTS AND DISCUSSION

This chapter presents an overview and analysis of the data collected from different groups of people in terms of gender, age, and speciality in healthcare. The

aim is to answer the research questions in this study as follows:

- a) What effect did the COVID-19 pandemic have on routine healthcare management practices in KSA?
- b) Which health policies did KSA have in place to fight against health crises such as COVID-19?
- c) How prepared were Saudi Arabia's healthcare systems for the prevention and management of the spread of the COVID-19 virus?
- d) What kind of changes has occurred in health management and services in KSA during the COVID-19 pandemic?

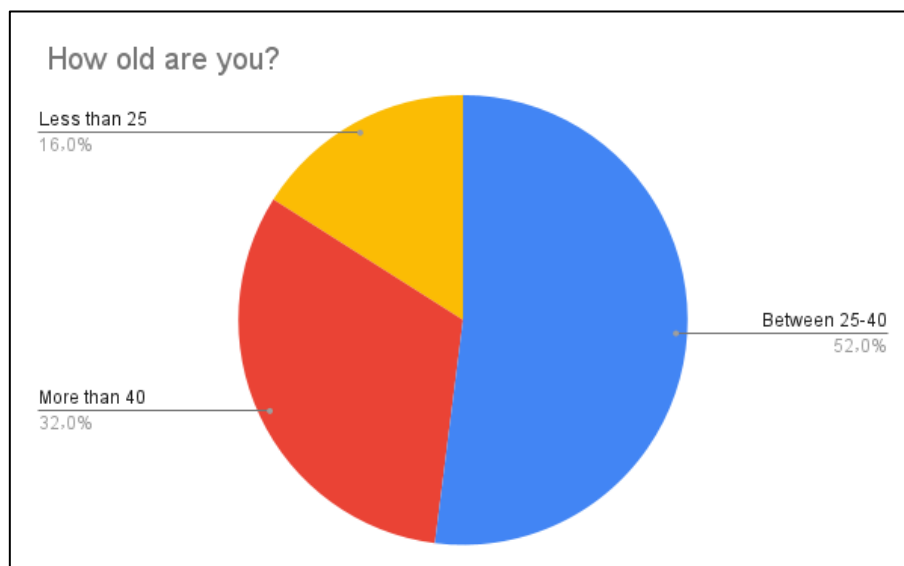
The survey was divided into two sections: demographic questions and the main questions related to the research objectives. The demographic questions in this survey were used to determine the general characteristics of the participants including their gender, age, and speciality in healthcare. This information was important for this research as it helped identify and assess patterns of behaviour and attitudes of the participants regarding the subject matter to understand the impact of COVID-19 on the healthcare management system. The demographic results are represented in the figure below:



**Figure 1: Demographic data- Gender representation**

From the results shown in the figures above, 60.0% of the survey participants were male, and 40% were female, which suggests that the male point of view

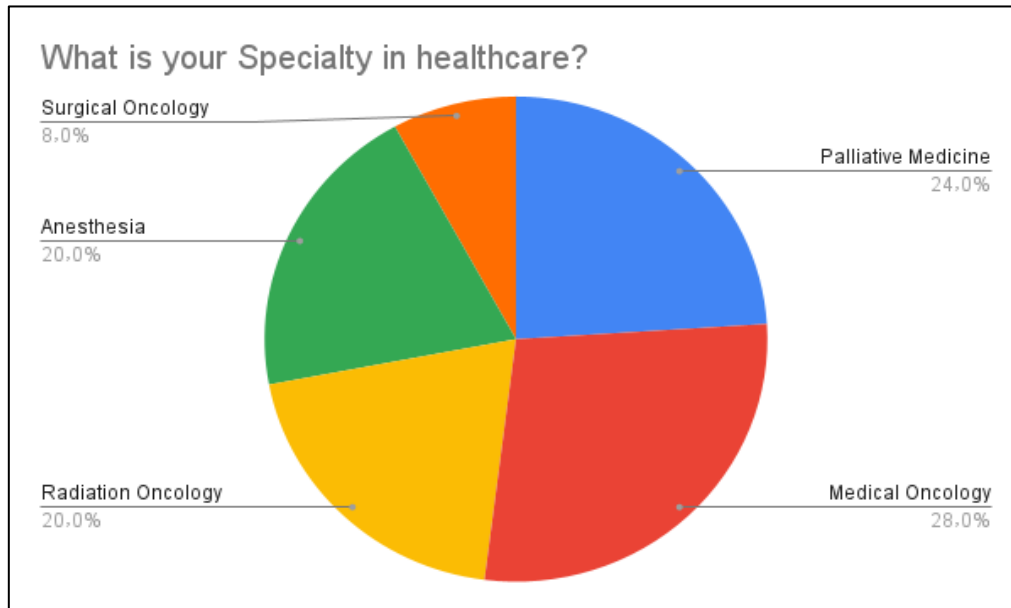
was dominant in this research, closely followed by the female point of view.



**Figure 2: Demographic data- Age**

The figure above shows that 16.0% of the participants were below 25 years old, 52.0% were between 25 years and 40 years, and 32.0% were over 40 years old. These results findings suggest that survey

participants were mostly between 25 and 40 years, thus they make up the dominant viewpoint regarding the subject under investigation.



**Figure 3: Demographic data-Participants speciality in healthcare**

The figure above shows that 8.0% of the participants specialize in Surgical Oncology, 20.0% specialize in Anesthesia, 20.0% specialize in Radiation Oncology, and 28.0% specialize in Medical Oncology, while 24.0% specialize in Palliative Medicine. These results indicate that most of the viewpoints acquired from the survey were made by professionals in medical oncology and the least contribution was made by surgical oncologists.

#### Analysis of Research-Specific Survey Questions

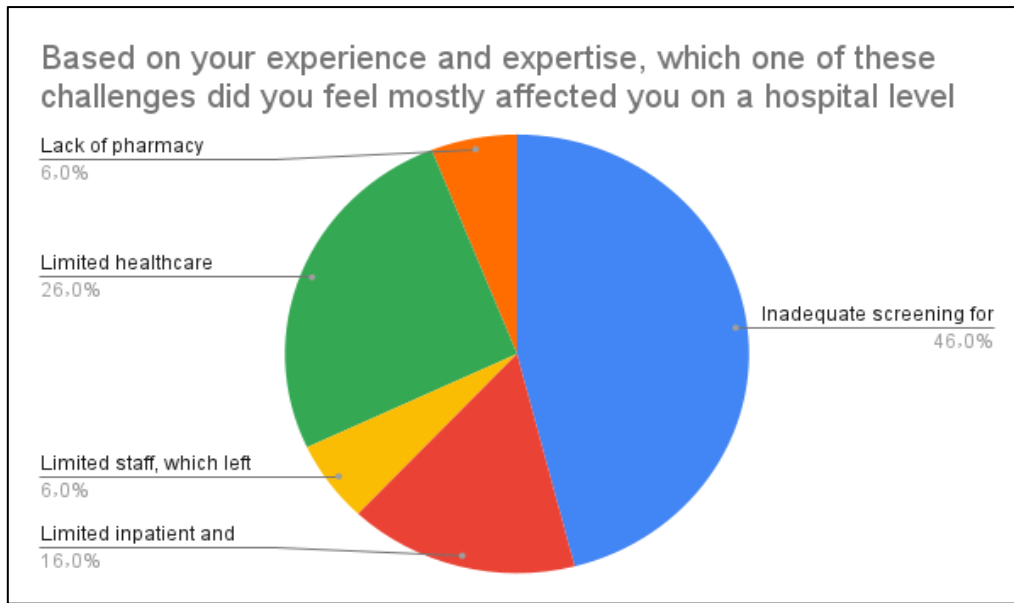
The second part of the survey was made up of nine questions, each of them designed to assess and gain an understanding of the different perceptions of the participants regarding the impact of the COVID-19 pandemic on healthcare management in the Kingdom of Saudi Arabia. During the survey, five themes emerged as follows:

- Challenges that affected the healthcare management team on personal and hospital levels
- The most important healthcare management input that was unavailable during the pandemic

- The level of preparedness for COVID-19 and future health emergencies
- Strategic measures are taken to minimize the spread of COVID-19
- Changes that have occurred in Saudi Arabia's healthcare institutions in preparation for future health emergencies.

KSA's healthcare systems responded to the pandemic immediately by introducing different health and safety measures, processes, and procedures, but it still struggled to manage the number of infections and deaths reported within the country as identified in the literature review. In light of this, the first two research-specific questions in the survey questionnaire aimed at assessing some of the key challenges that affected healthcare management systems in Saudi Arabia, both on a personal level and an institutional level. Several personal and institutional challenges were listed and the participants were asked to identify the challenges that affected them the most during the COVID-19 pandemic. The results are as represented in the figures below:

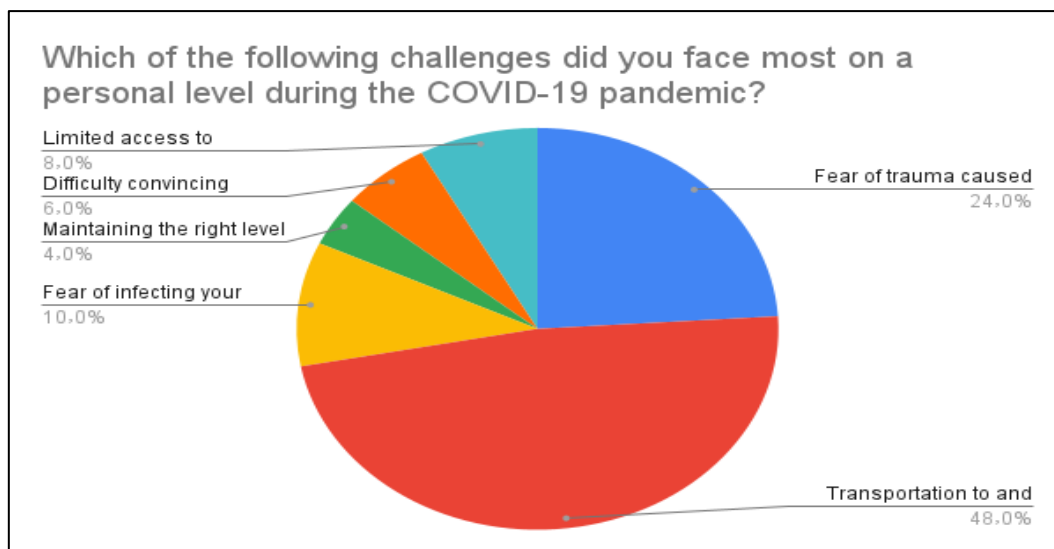




**Figure 4: Challenges that affected the participants on a hospital level**

The figure above shows that participants experienced several challenges on an institutional level, but in different magnitudes. The majority of the participants (46.0%) cited inadequate screening for potential COVID-19 patients, 26.0% cited limited healthcare facilities to attend to COVID-19 patients, 16.0% cited limited inpatient and outpatient services, 6.0% cited lack of pharmacy dispensing wings to ease access for patients in need of certain medications, and 6.0% cited limited staff. From these findings, it can be inferred that Saudi Arabia's healthcare management system faced a myriad of substantial management challenges as a result of the COVID-19 pandemic.

These findings are consistent with the existing literature, which demonstrates that the unprecedented nature of the virus imposed significant uncertain challenges and threats for healthcare management systems across the world, which exerted a negative impact on the relevance of public health. Particularly, research by Yahia (2020) shows that KSA's healthcare delivery institutions faced notable challenges during the COVID-19 pandemic including shortages in the supply of personal protective equipment (PPE), inadequate capacity, the need to redesign care, financial losses and adjusting the capacity of the workforce to work around the new budget.



**Figure 5: Challenges that affected participants on a personal level**

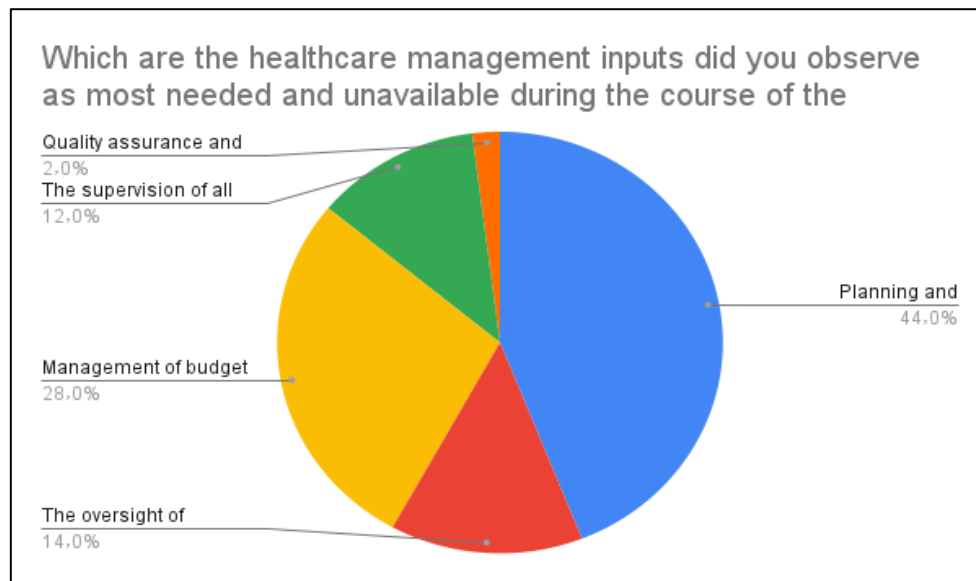
In terms of the challenges facing healthcare management systems in KSA, participants revealed that they experienced several challenges on a personal level. Figure 5 above demonstrates that 48.0% of the

participants faced the challenge of transportation to and from the hospital, 24.0% feared the trauma of stigmatization and discrimination from society, 10.0% feared that they might infect their loved ones at home,

8.0% had limited access to information regarding COVID-19 guidelines, 6.0% faced a challenge convincing patients with mild symptoms to stay at home and observe the guidelines to avoid flooding the hospitals, and 4.0% struggled to maintain the right level of hygiene when interacting with patients and colleagues. These findings are consistent with the current literature, which postulates that COVID-19 greatly impacted healthcare management since healthcare leaders, managers, and administrators had to adapt to the changes by transforming their organizations to deliver quality services even amid the pandemic. Particularly, research conducted by Tengilimoğlu *et al.*, (2021) shows that KSA's healthcare management was

significantly affected by the COVID-19 pandemic because management teams had to transform their ways of doing things to effectively implement different health and safety measures, processes, and procedures to manage the spread of the virus.

The current research also aimed at investigating whether some essential healthcare management functions were inadequate or unavailable during the pandemic. To find this out, a list of input were listed and participants were asked to identify the most important ones that were unavailable during the pandemic. The results were as indicated in figure 6 below Figure 6.

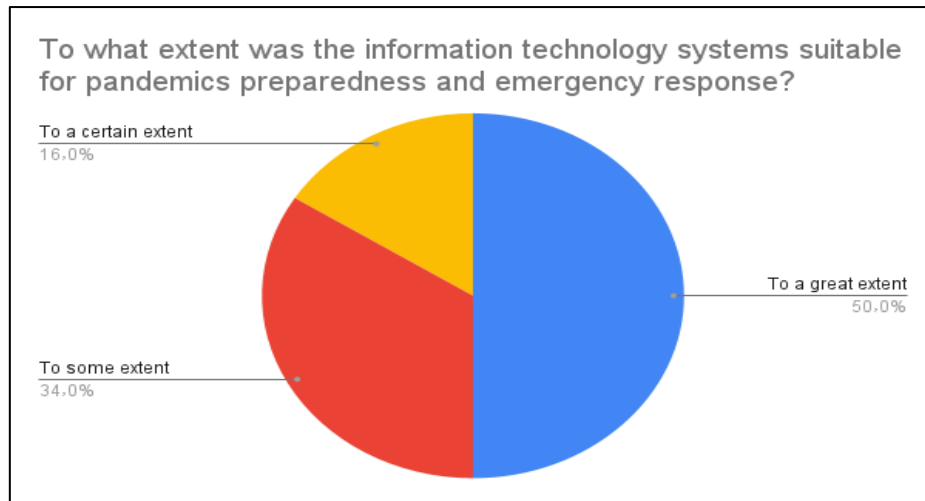


**Figure 6: Availability of essential healthcare management input**

From the above figure, 2.0% cited that quality assurance and risk assessment function was highly needed but it was either unavailable or inadequate, 12.0% cited the supervision and ensuring the safety of all healthcare staff, 28.0% stated budget management and work schedule, 14.0% cited the oversight of individual departments to ensure that they are run smoothly and effectively, while 44.0% stated planning and coordination of equipment, medication, hospital space, infrastructure, specialized services. From these findings, it can be inferred that KSA's healthcare management functions were significantly impacted by the COVID-19 pandemic because they were not completely adequate. According to the available literature, healthcare management functions in Saudi Arabia's healthcare system were significantly impacted by the pandemic due to various inefficiencies. For instance, several studies including Traiki *et al.*, 2020; Cullen *et al.*, 2020; Alhodaib & Alanzi, 2021; and Yahia, 2020 showed that inadequate capacity to handle the rising number of COVID-19 patients was one of the

key challenges facing Saudi Arabia's healthcare institutions. These findings are consistent with the current research's findings that one of the key challenges facing KSA's healthcare management was the inadequacy or lack of proper planning and coordination of equipment, hospital space and infrastructure, and medication. Additionally, numerous studies show that there was a shortage of healthcare providers during the peak of the pandemic due to the increasing demand by COVID-19 patients in KSA (Al Sulais *et al.*, 2020; Alaama & Jokhdar, 2021; Alwaqadani *et al.*, 2021; Balghith, 2020). These findings are consistent with the current research, which has found that there was poor management of the budget and work schedule.

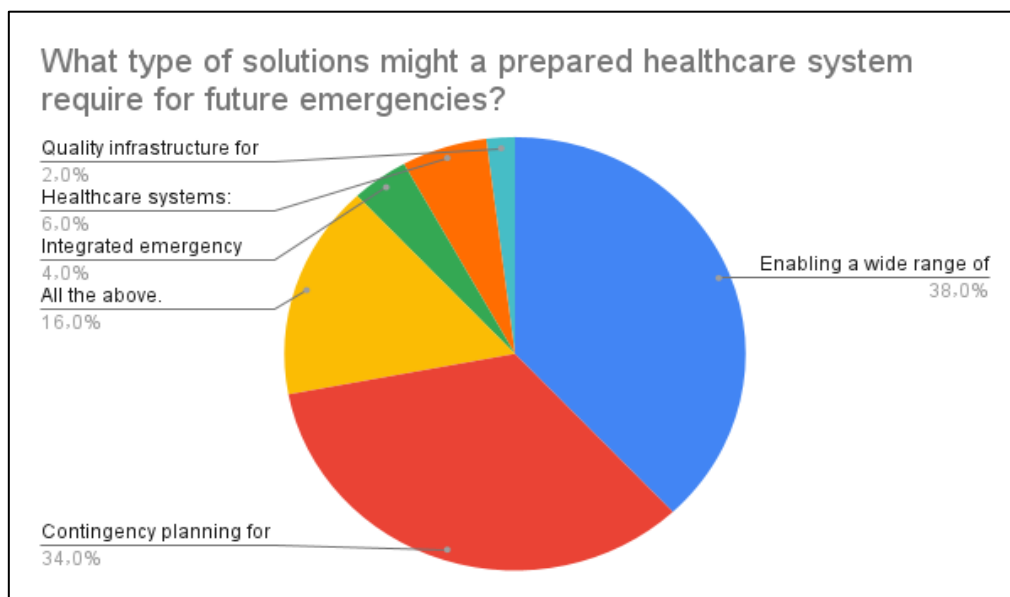
The current study also aimed at investigating the level of preparedness for COVID-19 and future health emergencies. Three survey questions were dedicated to investigating this theme and the results were as follows: Figure7.



**Figure 7: The use of IT systems for pandemic preparedness and health emergencies**

The survey aimed at examining the extent to which IT systems are suitable for preparedness during pandemics and health emergencies. From the figure above, 16.0% of the participants indicated to a certain extent, 34.0% indicated to some extent, and 50.0%

indicated to a great extent. From these findings, the current study can hypothesize that IT systems are highly important for preparedness during pandemics and health emergencies.



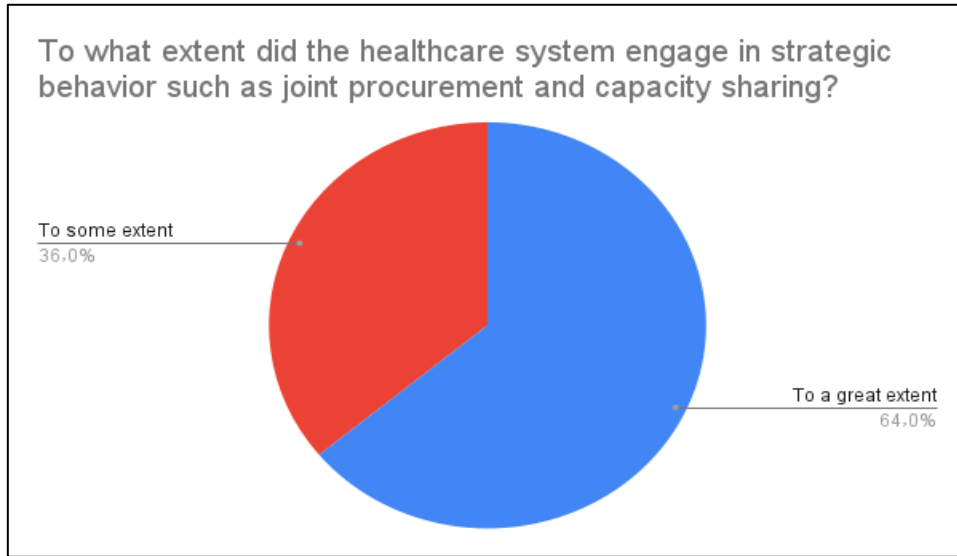
**Figure 8: Solutions for pandemic and health emergencies preparedness**

Still on the subject of preparedness, the current research aimed at identifying some of the most effective solutions that a healthcare system may require for future emergencies. The findings were such that 2.0% of the participants indicated quality infrastructure for resilient healthcare services, 4.0% indicated integrated emergency response, 6.0% indicated strategies to increase surge capacity and coordination, 38.0% indicated implementing a wide range of enabling factors such as adequate equipment, financing, skilled staff, effective information systems, and efficient management and operational protocols, while 16.0% indicated all the above factors. From these findings, it is evident that most participants favoured having a more

inclusive approach where all healthcare management inputs are enabled. This leads the current research to infer that the best solution to ensure that a healthcare system is well prepared for future pandemics is to enable a wide range of enabling factors to ensure nothing is left to chance. This inference aligns with the existing literature, which postulates that the best way for healthcare institutions to prepare for future calamities such as the COVID-19 pandemic is to reshape the way every aspect of healthcare is managed and adopting more flexible approaches such as improving and coordinating all healthcare functions in readiness for unprecedented events (Balghith, 2020).

The current study also aimed at examining the strategies and policies implemented by healthcare institutions in Saudi Arabia to manage the spread of

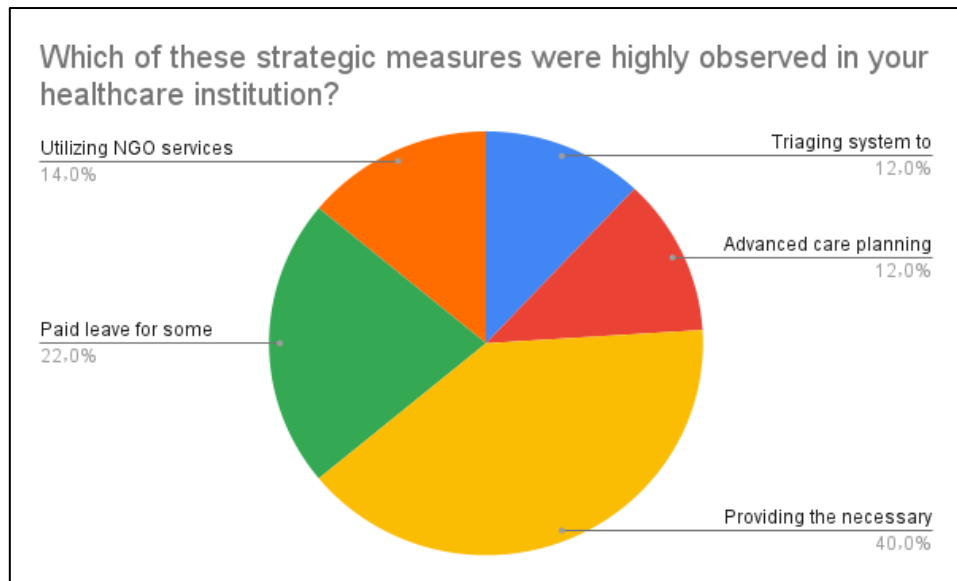
COVID-19. Three survey questions were dedicated to this assessment and the results are as shown in the figures below:



**Figure 9: The extent to which healthcare systems engaged in strategic behaviour during COVID-19**

First, the survey aimed at investigating the rate at which healthcare institutions in Saudi Arabia engaged in strategic behaviour. The results show that 36.0%

indicated to some extent while 64.0% indicated to a great extent.



**Figure 10: Strategic measures observed in Saudi Arabia’s healthcare institutions**

The figure above shows some of the strategic measures adopted in KSA’s healthcare institutions and the extent to which they are observed. According to the findings, 14.0% stated that their healthcare institution observed utilization of NGOs, 22.0% stated offering paid leave for some healthcare staff, 12.0% stated triaging system to identify patients in need of specialized care during the pandemic, 12.0% stated advanced care planning, while 40.0% stated the provision of the necessary PPE equipment such as face masks and sanitisers. These findings are consistent with

the existing literature, which postulates that the COVID-19 pandemic caused a historic increase in financial expenses and losses due to various reasons including cancelled elective inpatient and outpatient surgeries due to social distancing and quarantine control measures, elective physician visits, and increased budget due to increased demand of supplies such as the personal protective equipment (PPE) for healthcare workers, hand sanitisers, toilet paper, hospital equipment, and water. This created a need for certain strategies and policies to remedy the situation. Some of

the strategies mentioned in the existing literature include minimizing the workforce by laying off some of

them and introducing remote working.

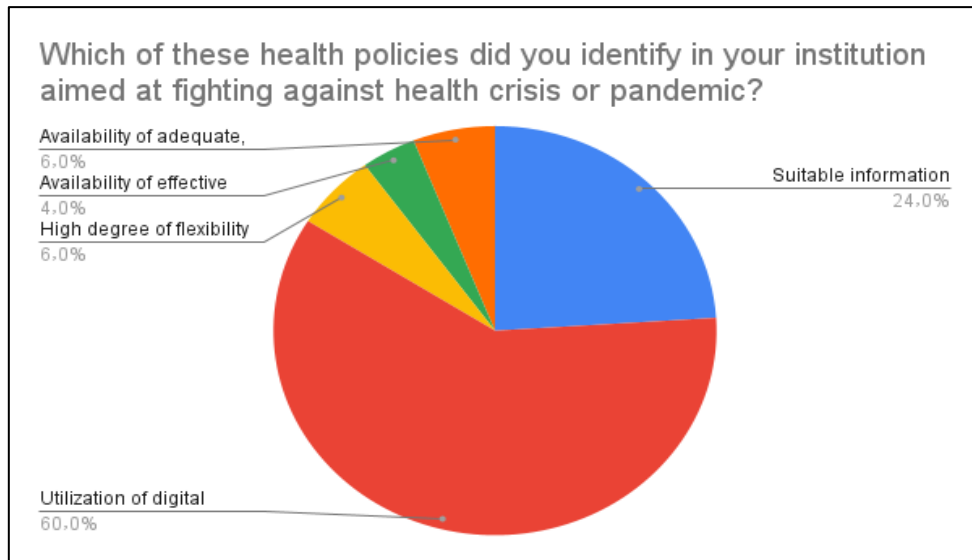


Figure 11: Policies adopted by KSA's healthcare institutions to manage the spread of COVID-19

From the figure above, it is evident that health institutions in KSA adopted several policies to fight against the spread of COVID-19. The results are such that 6.0% identified the availability of adequate, highly trained, and reliable healthcare workers, 4.0% identified the availability of effective surveillance and response systems, 6.0% identifies a high degree of flexibility in the participants' jurisdiction to manage the healthcare facility during emergencies, while 24.0% indicated suitable IT systems for pandemics and emergency preparedness. In line with these findings, the existing literature shows that whenever a health emergency such as COVID-19 occurs, the entire healthcare system is

required to respond swiftly to prevent or manage the effects of the disease, its morbidities, and mortalities. Some of the policies mentioned in the existing literature are similar to the ones identified in the current study including the integration of IT systems and staff training (Aleaniz & Alqahtani, 2022).

Finally, the current research aimed at assessing some of the changes that have occurred in Saudi Arabia's healthcare institutions in preparation for future health emergencies. The figure below shows the survey questions and responses aimed at contributing to this knowledge.

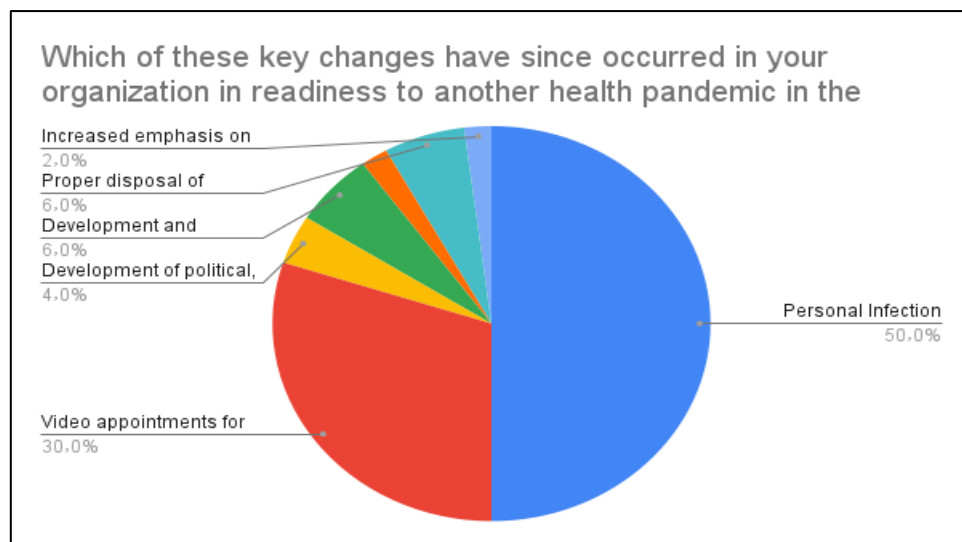


Figure 12: Key changes that have occurred in KSA's healthcare institutions

From the above representation, 2.0% cited an increased emphasis on digital surveillance systems and data analysis, 6.0% cited utilization of Technology-

Based Approaches to communication, 6.0% cited the development of legislative and Healthcare Management Systems, while 50.0% cited the implementation of

Personal Infection Control protocols within healthcare institutions including hand sanitisers and temperature checks. These findings show that some changes have occurred in KSA's healthcare system due to the pandemic and a lot is being done in preparation for future health emergencies. These findings align with the existing literature, which shows that hospital preparedness and resilience play an essential role in the continuous effort to alleviate the catastrophic effects of the COVID-19 pandemic as well as to minimize its spread (Aleaniz & Alqahtani, 2022).

## CONCLUSION

The current study aimed at identifying the COVID-19 pandemic on healthcare management at Hafar Al Batin Central Hospital. Past studies have identified that KSA's healthcare systems responded to the pandemic immediately by introducing different health and safety measures, processes, and procedures. However, managing the number of infections and deaths reported within the country was still a significant challenge. To this end, the current study has investigated the impact of COVID-19 on healthcare management in Hafar Al Batin Central Hospital to contribute to the existing literature by identifying key challenges and difficulties faced by healthcare managers in preventing the further spread of the virus and protecting the uninfected patients and the healthcare workers in KSA, identifying. The study will also contribute to the existing literature as it has identified key strategies and policies that have been put in place by healthcare institutions in preparation for future pandemics and health emergencies.

## Authors' Contributions

This work was carried out in collaboration among all authors. All read and approved the final manuscript.

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