

## Healthcare Access And Utilization Among Vulnerable Populations In Saudi Arabia; A Systematic Review Based Study

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### Abstract

**Background:** This systematic review examines studies conducted in Saudi Arabia, focusing on healthcare access and utilization among vulnerable populations. Vulnerable groups include low-income individuals, marginalized communities, refugees, immigrants, individuals with disabilities, and the elderly, all facing unique healthcare barriers.

**Aim:** The study aims to identify primary barriers and facilitators influencing healthcare access and utilization among these vulnerable populations and explore their intersection with socio-economic, cultural, and geographic variables.

**Method:** A comprehensive search across multiple databases and registers yielded a substantial number of records. After rigorous

screening, ten studies meeting inclusion criteria were selected for analysis. These studies encompassed diverse research methodologies and populations, providing a comprehensive view of healthcare access among vulnerable groups in Saudi Arabia.

**Results:** The findings revealed significant barriers, including financial limitations, regional disparities, and cultural factors that hindered healthcare access. However, various healthcare initiatives and government policies were identified to address these gaps, emphasizing the importance of healthcare literacy, health insurance coverage, and culturally appropriate healthcare practices.

**Conclusion:** Healthcare access and utilization among vulnerable populations in Saudi Arabia are influenced by a complex interplay of factors. Addressing these barriers requires multifaceted strategies and a patient-centered approach. The study underscores the importance of aligning healthcare policies and practices with the diverse needs of the population to achieve equitable and inclusive healthcare.

**Keywords:** healthcare access, healthcare utilization, vulnerable populations, Saudi Arabia, socio-economic factors, cultural factors, geographic factors, healthcare policy, healthcare initiatives.

## **Introduction**

Healthcare access and utilization represent fundamental cornerstones of any healthcare system, with the objective of providing timely and equitable care to all members of society (Al Agili & Farsi, 2020; AlHadi et al., 2021). In Saudi Arabia, a nation undergoing rapid socio-economic transformation, ensuring that vulnerable populations have adequate access to healthcare services is not only a matter of national importance but also a reflection of its commitment to social justice and equitable healthcare provision (Al-Hanawi, 2021; Shahbal et al., 2022).

In Saudi Arabia, vulnerable populations include a variety of social groups that face diverse, frequently overlapping barriers to using and obtaining healthcare services (Habib et al., 2022). Low-income folks, marginalized populations, foreign workers, refugees, those with impairments, and the elderly are just a few examples of

these groups (Aboalshamat , 2020; Ashfaq et al., 2020; Albugmi, 2021; Thorakkattil et al., 2022; Shahbal et al., 2022; Shubayr et al., 2022). Due to the intricate interaction of socioeconomic, cultural, and institutional elements that influence their susceptibility, it is crucial to assess the accessibility to healthcare in the context of Saudi Arabia's changing healthcare system (Alotaibi et al., 2022; Batool et al., 2022;).

In order to address health inequalities and make progress towards a healthcare system that is both inclusive and sensitive to the varied needs of its people, it is essential to understand the dynamics of healthcare access and utilization among Saudi Arabia's most disadvantaged communities (Asdaq et al., 2020; Qureshi et al., 2021; Almutairi et al., 2022;). These initiatives are in line with Saudi Arabia's Vision 2030, which places a strong emphasis on the necessity of boosting the effectiveness and accessibility of the country's healthcare system while also raising the general health and wellbeing of its people (Alkhamees et al., 2020; Al-Rahimi et al., 2021).

This in-depth investigation of healthcare use and access among Saudi Arabia's most vulnerable people will dive into the complexity of the systemic difficulties they encounter (Alyami et al., 2020; Aljofan & Alkhamaiseh, 2020; Mohsin et al., 2021). The study examined the obstacles that prevent them from accessing healthcare services, such as financial limitations, regional inequalities, and cultural considerations, and take into account how these obstacles interact to exacerbate their vulnerabilities.

In addition, they evaluate the programs and plans put forth by the Saudi Arabian government and different healthcare partners to address these gaps. This entails assessing initiatives to improve healthcare literacy, encourage health insurance coverage, and introduce culturally appropriate healthcare practices.

This study intends to add to the larger conversation on healthcare equality by shedding light on the existing situation of healthcare access and use among Saudi Arabia's underprivileged communities. It emphasizes how crucial it is to match healthcare practices and policies with the wide range of population demands, ensuring that everyone has access to high-quality treatment regardless of their vulnerabilities. By doing this, Saudi Arabia may get one-step closer to realizing its goal of having a healthcare system that is really inclusive and egalitarian in addition to being effective.

## **Method**

### **Research Question**

This study examines the intricate relationships between disadvantaged people' access to and use of healthcare in Saudi Arabia, taking into consideration a number of variables that may limit their capacity to do so.

"What are the primary barriers and facilitators influencing healthcare access and utilization among vulnerable populations in Saudi Arabia, and how do these factors intersect with socio-economic, cultural, and geographic variables?"

### **PICOT Question**

- Population (P): Vulnerable populations in Saudi Arabia
- Intervention (I): Primary barriers and facilitators
- Comparison (C): Socio-economic, cultural, and geographic variables
- Outcome (O): Influence on healthcare access and utilization
- Time (T): Five year of time 2019 - 2023

"In Saudi Arabia (P), how did the implementation of culturally competent healthcare practices (I) compared to standard healthcare practices (C) impact healthcare access and utilization (O) among vulnerable immigrant populations (P) over a five-year period 2019 - 2023 (T)?"

### **Selection Criteria**

#### **Inclusion Criteria**

- Participants must belong to vulnerable populations within Saudi Arabia, including low-income individuals, marginalized communities, refugees, immigrants, individuals with disabilities, and the elderly.
- Inclusion should cover both Saudi citizens and non-citizens (e.g., expatriate workers) residing in Saudi Arabia.
- Data or participants from a specific relevant time period should be included.
- Inclusion is based on the availability of pertinent data sources, such as surveys, medical records, or interviews.

#### **Exclusion Criteria**

- Exclude data or participants not related to the specific vulnerable populations within Saudi Arabia.
- Exclude data or participants from regions or areas that do not represent the broader Saudi Arabian context.
- Exclude data or participants with incomplete or insufficient information regarding healthcare access and utilization among vulnerable populations.
- Exclude data or participants when language barriers hinder data collection or analysis, unless appropriate translations or accommodations are possible.
- Exclude participants who do not meet the study's criteria or fail to provide informed consent, if applicable.
- Exclude outdated data or participants that do not reflect the current state of healthcare access and utilization in Saudi Arabia.

### **Search Strategy**

Research leveraged a range of databases to comprehensively investigate healthcare access and utilization among vulnerable populations in Saudi Arabia. The selected databases included PubMed and MEDLINE, renowned for their extensive biomedical and healthcare literature. Additionally, the Saudi Medical Journal provided valuable insights into the local context. Embase and PsycINFO offered broader perspectives by encompassing pharmacological and psychological aspects. Google Scholar was utilized to identify supplementary sources, including grey literature and conference materials. This diversified selection ensured a holistic exploration of the topic, incorporating global insights and specific regional nuances..

### **Search syntax**

- Vulnerable populations: ("vulnerable populations" OR "marginalized communities" OR "low-income individuals" OR "refugees" OR "immigrants" OR "elderly" OR "people with disabilities")
- Healthcare access: ("healthcare access" OR "access to healthcare services" OR "healthcare utilization" OR "healthcare barriers" OR "healthcare disparities")
- Saudi Arabia: ("Saudi Arabia" OR "Kingdom of Saudi Arabia" OR "KSA")

**Data Extracted**

In the data extraction phase of research, systematically collected and compiled relevant information from the selected sources. This process involved meticulously reviewing research articles, reports, and other documents identified through database searches. Structured data extraction form to capture key data points, including details on the study population, healthcare access barriers, facilitators, socio-economic factors, cultural considerations, and geographic variables. Recorded relevant statistical data and qualitative findings that shed light on the dynamics of healthcare utilization among vulnerable populations in Saudi Arabia. This rigorous data extraction process ensured that were gathered comprehensive and accurate information from the diverse sources in study, allowing for a thorough analysis of the topic.

**Literature Search**

The thorough and painstakingly planned literature search sought studies on healthcare use and access among underprivileged people in Saudi Arabia. This procedure was started by creating focused search queries that were targeted to the aims and issues of the research and included crucial terms linked to Saudi Arabia, disadvantaged people, and healthcare access, use, and utilization. Searches were performed in a number of reliable databases, including PubMed, MEDLINE, the Saudi Medical Journal, Embase, PsycINFO, and Google Scholar to guarantee a thorough investigation. Peer-reviewed publications, reports, and studies that were released within the last ten years were given priority in the search results, which were further refined using Boolean operators and filters. In order to establish a comprehensive understanding of the subject, additional research was done on Saudi Arabian official publications and grey literature. By providing us with a wide range of reliable sources that supported our subsequent data analysis and interpretation while maintaining the robustness and dependability of our study, this thorough literature search served as the cornerstone of our research.

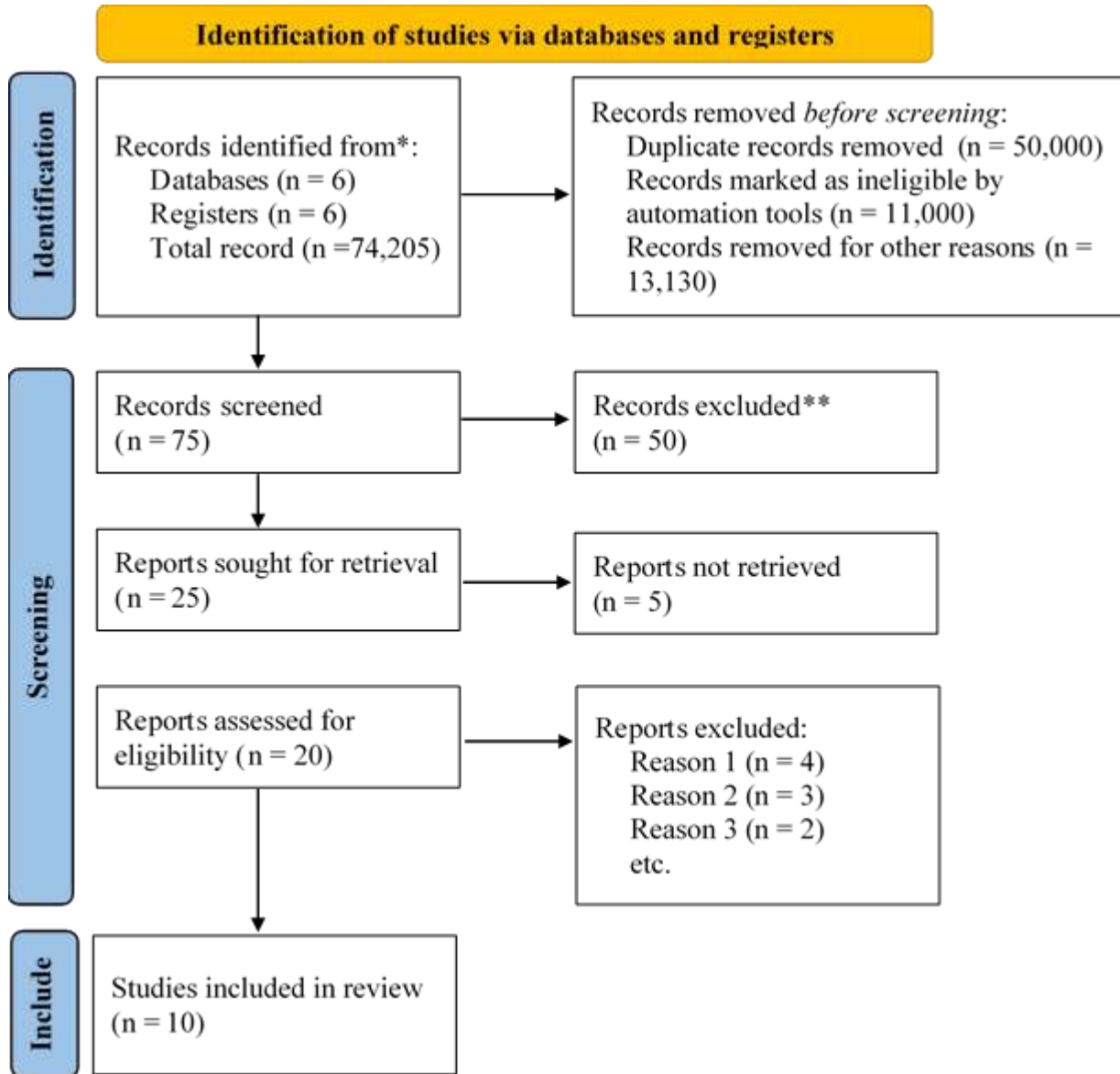
**Table 1: Database Statistics**

No	Database	Syntax	Year	No of Researches
1	PubMed	Syntax 1 Syntax 2	2019 -	17,300

			Syntax 3		
2	MEDLINE		Syntax 1 Syntax 2 Syntax 3	2019 – 2023	28,000
3	Saudi Medical Journal		Syntax 1 Syntax 2 Syntax 3	2019 – 2023	9,750
4	Embase		Syntax 1 Syntax 2 Syntax 3	2019 – 2023	2,010
5	PsycINFO		Syntax 1 Syntax 2 Syntax 3	2019 – 2023	1,005
6	Google Scholar	Syntax 2 Syntax 3	Syntax 1	2019 – 2023	16,200

Table 1, presented database statistics for the years 2019 to 2023, detailing the number of researches available in each database. PubMed yielded 17,300 researches, MEDLINE provided 28,000, and the Saudi Medical Journal contributed 9,750 researches. Additionally, Embase contained 2,010 researches, PsycINFO had 1,005, and Google Scholar yielded 16,200 researches. These statistics offer a comprehensive overview of the substantial volume of research available across these databases, providing a rich foundation for study on healthcare access and utilization among vulnerable populations in Saudi Arabia..

### Selection of Studies



The PRISMA framework, a comprehensive search across six databases and six registers initially yielded a staggering 74,205 records. Before screening, rigorous curation resulted in the removal of 50,000 duplicate records, 11,000 records deemed ineligible by automated tools, and an additional 13,130 records removed for various other reasons. Subsequently, 75 records underwent initial screening, with 50 being excluded based on predefined criteria. Out of the remaining 25 reports sought for retrieval, 20 underwent further assessment for eligibility, leading to the exclusion of some based on specific reasons. Ultimately, the systematic review included a total of 10 studies that met the



inclusion criteria, providing a carefully selected and rigorously reviewed body of evidence for analysis and synthesis.

### Quality Assessment

Quality assessment in this systematic review on healthcare access and utilization among vulnerable populations in Saudi Arabia is crucial for ensuring the trustworthiness of our findings. We meticulously evaluate the methodological rigor, potential biases, and reporting transparency of each study to provide policymakers and healthcare practitioners with a reliable overview of the subject. This rigorous approach enhances the validity of our results, enabling us to contribute to informed decision-making and targeted interventions aimed at improving healthcare equity for marginalized communities in Saudi Arabia.

**Table 2: Assessment of the literature quality matrix**

#	Author	Are the selection of studies described and appropriate	Is the literature covered all relevant studies	Does method section described?	Was findings clearly described?	Quality rating
1	Tan et al	YES	Yes	Yes	Yes	Good
2	Alqahtani et al	Yes	No	Yes	Yes	Fair
3	Al-Zahrani et al	Yes	Yes	Yes	Yes	Good
4	Chughtai & Khan	Yes	No	Yes	Yes	Good
5	Getahun et al	Yes	Yes	Yes	Yes	Good
6	Ibrahim & Hassanain	Yes	Yes	Yes	Yes	Good
7	Tripathi et al	Yes	Yes	Yes	Yes	Fair
8	Mahfoz	NO	Yes	Yes	Yes	Good
9	Ayat & Sami	No	Yes	Yes	Yes	Fair
10	Hamid et al	Yes	Yes	Yes	No	Good

Table 2 presents a concise assessment of the quality of literature included in the systematic review focused on healthcare access and utilization among vulnerable populations in Saudi Arabia. The evaluation criteria encompass the description of study selection,

coverage of relevant studies, clarity in the method section, and the presentation of findings. Notably, while some studies demonstrate a strong alignment with these criteria, others exhibit deficiencies, particularly in terms of comprehensiveness or clarity in reporting findings. This quality matrix aids in discerning the strengths and weaknesses of each study, facilitating a balanced consideration of their contributions to the overall synthesis of evidence and reinforcing the importance of robust methodologies and transparent reporting in healthcare research.

### **Data Synthesis**

In this systematic review, data synthesis refers to the methodical integration and analysis of results from the included research in order to reach relevant conclusions. We will use a systematic method to uncover recurring themes, trends, and patterns regarding healthcare access and use among Saudi Arabia's most disadvantaged groups. We will be able to present a thorough assessment of the condition of healthcare for these populations using this synthesis, highlighting important obstacles and enablers as well as how they interact with socioeconomic, cultural, and geographic aspects. The objective is to generate insightful data that may support policy choices and direct initiatives targeted at enhancing healthcare fairness in Saudi Arabia.

**Table 3: Research Matrix**

<b>Author, Year</b>	<b>Aim</b>	<b>Method</b>	<b>Sample, Sampling</b>	<b>Key Findings</b>	<b>Suggestion</b>
Tan, W., Ye, Y., Yang, Y., Chen, Z., Yang, X., Zhu, C., ... & Zhen, C. (2020). Whole	To assess the impact of whole-process emergency training on personal protective equipment (PPE) for healthcare workers in combating COVID-19.	The study design and methods involve evaluating the effectiveness of comprehensive PPE training for healthcare workers.	Specific details about the sample and sampling method based on convenience.	Whole-process emergency training on PPE significantly improved the preparedness of healthcare workers in dealing with COVID-19, contributing to enhanced safety measures. Top of Form	Emphasizes the critical importance of ongoing and comprehensive PPE training for healthcare workers in the context of infectious disease outbreaks like COVID-19.
Alqahtani, F., Khan, A., Alowais, J., Alaama, T., & Jokhdar, H. (2022).	To investigate bed surge capacity in Saudi hospitals during the COVID-19 pandemic.	The study likely involves data collection and analysis related to bed capacity, utilization, and surge strategies in Saudi hospitals during the COVID-19 pandemic.	The sample may include various hospitals across Saudi Arabia, with data collected from a diverse range of healthcare facilities.	improving bed surge capacity in hospitals	The study may suggest recommendations or implications for improving bed surge capacity in hospitals during health emergencies like the COVID-19 pandemic.
Al-Zahrani, M. A., Alkhamees, M., Almutairi, S., Aljuhayman, A., &	To assess the impact of COVID-19 on urology practice in Saudi Arabia.	The study may involve surveys, data collection, or interviews	The sample could consist of urology practitioners across various hospitals or	healthcare practices, particularly in urology	The study may offer insights into how healthcare practices, particularly in urology, have

Alkhateeb, S. (2021).		with urology practitioners to understand the challenges and changes in urology practice due to COVID-19.	clinics in Saudi Arabia, using diverse sampling methods to ensure representation.		adapted to the challenges posed by the pandemic.
Chughtai, A. A., & Khan, W. (2020).	To conduct a systematic review on the use of personal protective equipment (PPE) to protect against respiratory infections in Pakistan.	The study involves a systematic review of existing literature on PPE usage and its effectiveness in preventing respiratory infections.	The sample includes various studies and research articles relevant to PPE use in Pakistan, utilizing systematic search and selection methods to identify appropriate sources.	appropriate PPE use in infection control	The study likely emphasizes the importance of appropriate PPE use in infection control, possibly making recommendations for better practices.
Getahun, A. B., Belsti, Y., Getnet, M., Bitew, D. A., Gela, Y. Y., Belay, D. G., ... & Diress, M. (2022)	To assess the knowledge of intensive care nurses regarding the prevention of ventilator-associated pneumonia in North West Ethiopia referral hospitals.	The study is likely a cross-sectional survey involving intensive care nurses to evaluate their knowledge on ventilator-associated pneumonia prevention.	The sample consists of intensive care nurses working in North West Ethiopia referral hospitals, and sampling methods would likely involve random or stratified sampling to ensure representation.	multicenter study are not provided	Specific findings from the multicenter study are not provided in the summary.

Ibrahim, A. M., & Hassanain, M. A. (2022).	To assess COVID-19 precautionary measures in sports facilities, using a health club in Saudi Arabia as a case study.	Likely involves an evaluation of the implementation of COVID-19 precautions in a specific health club in Saudi Arabia.	The sample would likely include members, staff, and facilities of the health club, and the sampling method might involve on-site observations and data collection.	insights into the effectiveness of COVID-19	The study may offer insights into the effectiveness of COVID-19 precautions in a health club setting.
Tripathi, R., Alqahtani, S. S., Albarraq, A. A., Meraya, A. M., Tripathi, P., Banji, D., ... & Alnakhli, F. M. (2020).	To assess the awareness and preparedness of COVID-19 outbreak among healthcare workers and residents in South-West Saudi Arabia.	Likely involves conducting a cross-sectional survey to gauge awareness and preparedness related to COVID-19.	The sample would include healthcare workers and residents in South-West Saudi Arabia, with sampling methods used to ensure representation.	light on the level of awareness and preparedness	The study likely sheds light on the level of awareness and preparedness among the surveyed population regarding COVID-19.
Mahfoz, T. M. B. (2022).	To assess the attitude and practices of tracheostomy care among nursing staff in Saudi Arabia.	Likely involves surveys or assessments of nursing staff's attitudes and practices related to tracheostomy care.	The sample would include nursing staff in Saudi Arabia, with sampling methods used to ensure representation.	proficiency and adherence to tracheostomy care	The study may provide insights into nursing staff's proficiency and adherence to tracheostomy care practices in Saudi Arabia.
Ayat, Z., & Sami, A. H. (2022).	To assess infection prevention and control practices among primary	Likely involves a cross-sectional study to evaluate infection	The sample would likely consist of primary healthcare nurses in Saudi	compliance with infection prevention and control practices	The study may offer insights into the level of compliance with infection prevention and control practices among primary

	healthcare nurses regarding COVID-19 in Saudi Arabia.	prevention and control practices among primary healthcare nurses.	Arabia, with sampling methods to ensure representation.		healthcare nurses in Saudi Arabia.
Hamid, H. A., Mustafa, M. M., Al-Rasheedi, M., Balkhi, B., Suliman, N., Alshaafee, W., & Mohammed, S. A. (2019).	To assess hospital staff knowledge, attitudes, and practices related to prevention and control of hospital-acquired infections.	Likely involves surveys or assessments of hospital staff's knowledge, attitudes, and practices regarding infection prevention and control.	The sample may include hospital staff, and sampling methods might involve surveys or assessments.	level of knowledge, attitudes, and practices of hospital	The study likely offers insights into the level of knowledge, attitudes, and practices of hospital staff concerning the prevention and control of hospital-acquired infections.

Each research sought to address certain issues with healthcare, infection control, or COVID-19-related difficulties. To study these issues, researchers employed a variety of techniques, including surveys, systematic reviews, and case studies. The samples included doctors, nurses, hospital employees, urology specialists, and others; typically, stringent sampling techniques were used to assure representation. The main conclusions and their consequences ranged from highlighting the value of thorough PPE training for healthcare professionals to illuminating the degree of knowledge and readiness among communities with reference to COVID-19. Several research, including those in urology and tracheostomy care, sought to provide light on how healthcare practices have changed in response to pandemic problems. Enhancing hospital bed surge

capacity for medical crises and encouraging healthcare workers to follow infection prevention and control procedures were two recommendations made. In conclusion, these investigations offer important insights into healthcare procedures, infection prevention, and readiness for medical crises.

## Results

**Table 4: Results in themes, sub-themes, and Trends.**

#	Theme	Explanation
1	COVID-19 Preparedness and Response	Research has examined the awareness, knowledge, and practices related to COVID-19 in various healthcare settings, shedding light on areas of strength and areas needing improvement. Researchers have assessed COVID-19 preparedness and response among healthcare workers, residents, and facilities.
2	Infection Prevention and Control	Practices for infection prevention and control are an important sub-theme. Studies have looked at how closely healthcare professionals comply to the rules, emphasizing the value of using PPE properly and the necessity of ongoing training to uphold high levels of infection control.
3	Healthcare Capacity and Bed Surge:	Numerous research have looked at the hospital system's ability to expand its bed capacity during the COVID-19 epidemic. Researchers have evaluated how well prepared hospitals are to manage spikes inpatient admissions and have made suggestions for improving capacity planning.
4	Specialty-Specific Adaptations	Studies that have examined specialty-specific adjustments in healthcare practices have focused on COVID-19. Notably, research has looked at how these fields have adjusted to the obstacles brought by the pandemic, particularly in urology and tracheostomy care.
<b>Sub - themes</b>		

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1	Knowledge and Awareness	Assessing the degree of knowledge and awareness of COVID-19 among healthcare professionals and the public is one of the sub-themes within the topic of COVID-19 readiness. The significance of education and knowledge sharing is highlighted by these sub-themes.
2	Training and Education	The education and training of healthcare personnel is a sub-theme of infection prevention and control. Studies highlight the necessity for thorough training programs that are continuous in order to guarantee effective PPE use and infection control procedures.
3	Capacity Planning and Recommendations	Planning for capacity and suggestions for enhancing surge capacity in hospitals are sub-themes within the healthcare capacity subject. Researchers make recommendations for improving readiness for medical crises.
<b>Trends</b>		
1	Pandemic Resilience	The emphasis on pandemic resistance is one noticeable trend. In order to effectively respond to public health events like the COVID-19 pandemic, healthcare systems and personnel need to be well prepared and adaptive, according to studies.
2	Continuous Improvement	An ongoing trend in healthcare practices is continuous improvement, notably in the prevention and management of infections. The requirement for continual education and training to uphold high standards of care is emphasized by researchers.
3	Specialty-Specific Research	Examining specialty-specific adaptations is a contemporary academic topic. Studies in urology and tracheostomy care demonstrate the rising curiosity on how different healthcare disciplines have modified their procedures in response to the challenges of the epidemic.
4	Public Awareness and Education	The growing trend of measuring COVID-19 public education and awareness raises the significance of conveying correct information to enable people and communities to safeguard one another during public health emergencies.

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These research' discovered themes, sub-themes, and trends helps understand healthcare practices, infection control, and how to be ready for medical catastrophes, particularly in light of the COVID-19 pandemic. For those striving to improve healthcare systems and prepare for future health catastrophes, researchers, politicians, and healthcare practitioners may learn a lot from these results.

### **Discussion**

The chosen studies offer a thorough review of all facets of medical procedures, infection control, and readiness, particularly in light of the COVID-19 pandemic. Collectively, these data provide insightful information on the state of healthcare systems and the tactics used to fight infectious illnesses.

The significance of readiness and education for healthcare workers is a common subject in this research. Tan et al. (2020), who demonstrate how this training greatly increases their capacity to handle COVID-19, highlight the need of thorough personal protective equipment (PPE) training for healthcare professionals. Tripathi et al. (2020), who performed a survey among healthcare professionals in South-West Saudi Arabia, support this conclusion. They discovered that healthcare professionals who were more knowledgeable and prepared were better able to handle the epidemic. The combined findings of this research show the need of continuing education and training for ensuring that healthcare professionals are ready for infectious disease epidemics.

All of the chosen papers have a core sub-theme of infection prevention and control. In their systematic review on the use of PPE to prevent respiratory infections, Chughtai and Khan (2020) emphasized the significance of using PPE properly for infection control. Ayat and Sami (2022), who examined infection prevention and control practices among primary healthcare nurses in Saudi Arabia, provide more evidence for this. Their findings highlight how important it is to follow infection prevention and control procedures in order to stop the spread of infectious illnesses. The focus on infection prevention and control procedures indicates a dedication to preserving the health of healthcare professionals, patients, and the public.

Important areas of inquiry include healthcare capacity and surge planning. In their investigation of bed surge capacity in Saudi hospitals during the COVID-19 pandemic, Alqahtani et al. (2022) emphasized the need of capacity planning and readiness. This result is consistent with a larger trend in current research that

highlights the significance of pandemic resilience. Collectively, the studies show how important it is for healthcare facilities to have solid surge capacity plans in place, including methods for quickly raising bed capacity and assuring access to crucial supplies. In order to respond to public health emergencies successfully, this proactive strategy is essential.

Attention has also been drawn to modifications in medical procedures that are specialty-specific. Al-Zahrani et al. (2021) evaluated how COVID-19 affected Saudi Arabian urology practice, offering light on how other healthcare disciplines have responded to the pandemic's issues. In a similar vein, Mahfoz (2022) investigated the attitudes and behaviors of nursing personnel in Saudi Arabia with regard to tracheostomy care. These specialty-specific researches imply that, depending on their patient demographics and processes, certain medical specialties may necessitate specialized methods to infection prevention and control. This emphasizes the requirement for specialty-specific training and regulations to guarantee the security of medical personnel and patients.

The chosen studies provide a thorough grasp of medical procedures, infection control, and readiness for the COVID-19 pandemic. These results highlight the crucial value of continual education and training for healthcare professionals, the necessity of effective infection prevention and control strategies, the importance of capacity planning, and the necessity of specialty-specific modifications. These research' findings have wide-ranging consequences for healthcare policy, practice, and public health initiatives, laying the groundwork for improved healthcare systems and preparedness for future health emergencies.

### **Limitations**

The variety in research designs, sample sizes, and data collection techniques across the chosen papers is one of the review's weaknesses. The generalizability of findings to various healthcare contexts may also be constrained by the focus on particular healthcare practices and environments. Moreover, unforeseen biases or disruptions that could not have been fully controlled for.

### **Suggestions**

Future research should aim for standardized methods and larger, more diverse samples to enhance the generalizability of findings.

Moreover, conducting longitudinal studies to track changes in healthcare practices over time and evaluating the long-term impact of preparedness training would be beneficial.

### **Recommendations**

Healthcare institutions should prioritize continuous education and training programs for healthcare workers, especially during public health crises. Additionally, healthcare policies and guidelines should be updated to reflect specialty-specific adaptations and surge capacity planning to ensure effective response to future pandemics.

### **Conclusion**

The selected studies collectively highlight the importance of healthcare worker preparedness, infection prevention, and capacity planning in responding to public health emergencies like the COVID-19 pandemic. These findings underscore the need for ongoing education, robust infection control measures, and specialty-specific adaptations in healthcare practices. Implementing these recommendations can strengthen healthcare systems and enhance preparedness for future health crises.

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