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RESEARCH ARTICLE

ADDRESSING THE CHALLENGES FACED BY HEALTHCARE PROVIDERS DURING THE IMPLEMENTATION OF TELEHEALTH IN SAUDI ARABIA: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Telehealth is expanding in Saudi Arabia, driven by Vision 2030, but faces challenges like technology gaps, providers training issues, and policy limitations. Addressing these barriers is the key to successful implementation and improved healthcare access. **Objectives:** The aim of this systematic review is to examine the latest literature on the challenges faced by healthcare providers in Saudi Arabia during the implementation of telehealth services. The utilization of telehealth as an effective means to provide quality services is steadily rising across different tiers of the health system. However, advancing telehealth utilization relies on the current healthcare systems' infrastructure, policies, cultural factors, and utilization requirements can influence the utilization of telehealth within Saudi Arabia's healthcare system. **Methods**: this systemic review conducted in three electronic databases—CINAHL (cumulative Index to Nursing and Allied Health Literature), Medline, and PubMed—targeting studies published between January 2019 to December 2024. The search used keywords derived from the PICO (Population, Intervention, Comparison, and Outcome) framework, focusing on telehealth, healthcare providers, and challenges specific to Saudi Arabia. The review followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, incorporating strict inclusion and exclusion criteria. Studies were included if they were: original research articles, published in English, peer-reviewed with full text available, conducted in Saudi Arabia, published between 2019 and 2024, and focused on challenges faced by healthcare providers in telehealth implementation. 16 studies achieved these norms. The quality of studies was assessed using the CASP (Critical Appraisal Skills Programme) and Quadstools, and data were systematically extracted to identify key themes and barriers. **Results:** The findings revealed that several challenges to telehealth implementation. Technological issues, such as poor internet connectivity and poor infrastructure. Training gaps and limited provider knowledge also slowing telehealth adoption. Cultural resistance, privacy concerns, and diagnostic limitations further complicated its effective use. Additionally, Policy Issues and financial problems. **Conclusion:** Telehealth has the potential to transform healthcare delivery in Saudi Arabia. However, addressing the barriers is important to realizing its full benefits. Investments in infrastructure, providing training programs, and clear regulatory frameworks are essential. These measures will align telehealth with Saudi Vision 2030, ensuring equitable and efficient healthcare access across the Kingdom.

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INTRODUCTION

The World Health Organization (WHO) defines telehealth as the use of ICTs (information and communication technologies) to deliver remote healthcare services, including research, diagnosis, assessment, and treatment (World Health Organization, 2015). Saudi Arabia's telemedicine sector has seen significant developments as part of "Vision 2030" and the E-Health Initiative for Digital Transformation. According to the (Ministry of Health) (https://www.moh.gov.sa/ en/ Ministry/nehs/Pages/vision2030.aspx)it aims to improve the efficiency and efficacy of various healthcare services. In 2017, the MOH (Ministry of Health) launched a strategic approach to improve healthcare management across the country (https://www.moh.gov.sa/ en/Ministry/ vro/ EHealth/ Documents/MoH-Digital-Health-Strategy-Update-2018.pdf). The COVID-19 pandemic has greatly accelerated the introduction of telehealth. Apps like SEHA (Abu Dhabi Health Services Company) and others such as Mawid, Tabaud, Tawakkalna,help to manage care instructions for the provider and their patients remotely (Alanzi, 2021). Telehealth adoption faces challenges such as limited technological access, limited internet access in rural areas, restrictions on physical examinations, technical issues, and privacy concerns. Regardless of these issues, its use is expected to grow as patients and providers become more comfortable with

technology over face-to-face interactions (Gajarawala, 2021; Ansarian, 2023).

METHODS

Search Strategy: The systematic review followed a comprehensive search strategy designed to identify relevant studies addressing the challenges faced by healthcare providers during the implementation of telehealth in Saudi Arabia. And was written following the Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelinesthree electronic databases were selected: CINAHL)(Cumulative Index to Nursing and Allied Health Literature, Medline, and PubMed, based on their relevance to the research topic and telehealth-related studies

Research Question (PICO format)

What are the challenges faced by healthcare providers in Saudi Arabia during the implementation of telehealth services?

Population: Healthcare providers in Saudi Arabia

Intervention: Implementation of telehealth services

Comparison: Not applicable (no comparison group)

Outcome: Identification of challenges faced during the implementation of telehealth

Inclusion criteria: The inclusion criteria include: 1) original articles 2) published in English and 3) in peer-reviewed journals and 4) available full text. In addition these studies will be included according to studies conducted in Saudi Arabia which is about (5) and discussed (6) the challenges faced by healthcare providers during telehealth implementation, and (7) were published during the period of 2019 to 2024.

Exclusion criteria: The exclusion criteria consisit of (1) articles published prior to 2019, and (2)written in languages other than English, 3) classified as systematic reviews, meta-analyses, reports, manuals, or editorials, and 4) studies that do not focus on the challenges faced by healthcare providers during the implementation of telehealth in Saudi Arabia.

Review Process: A total of 307 records were identified from PubMed, Medline, and CINAHL. After removing 38 duplicates, 269 articles remained. Title and abstract screening excluded 179 studies due to irrelevance or geographical mismatch. Of the 90 articles reviewed further, 49 were excluded for focusing on patient perspectives, being reviews rather than original research, or involving student participants. Full-text assessment of 41 articles led to the exclusion of 25 studies that did not address telehealth challenges. Ultimately, 16 studies met the inclusion criteria—14 quantitative, 1 qualitative, and 1 mixed-methods. Figure 1. Systematic Review Diagram Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) which included all included studies

RESULTS

Study Design and Sample Characteristics: Sixteen studies were identified and included in this study. Quantitative studies were the most cited study design (n=14), qualitative study (n=1) and mix-methods (n=1), Study Design and Sample Characteristics shown in Table 1.

Findings: Table 2 summarizes all the findings from the included studies andcategorized them thematically, focusing on the major barriers to telehealth implementation and utilization. The key themes identified include 1) technological and infrastructure challenges, which impact the reliability and integration of telehealth systems; 2) training and knowledge gaps that limit the readiness of healthcare providers 3) cultural and privacy concerns that affect the acceptance and use of telehealth by patients and providers; 4) diagnostic and assessment limitations that hinder accurate care delivery; 5) patient-related barriers, including discomfort and limited access to necessary technology; 6) time constraints and workload challenges faced by healthcare providers; 7) legal and policy issues that complicate the adoption and regulation of telehealth; 8) cost and resource limitations that restrict broader adoption of telehealth.

DISCUSSION

The findings of this systematic review align closely with studies conducted globally, (Steindal, 2023; Almathami, 2020; Rettinger, 2023) demonstrating barriers in telehealth implementation. challenges, such connectivity issues, and inadequate technical skills among providers and patients, emphasizing unreliable internet, poor video/audio quality, and unfamiliarity with telehealth technologies. Additionally, usability and training barriers, such as non-intuitive platforms, insufficient training, and limited provider knowledge, were significant obstacles (Giebel, 2023; Rajkumar, 2023). Other common challenges included data privacy and security concerns, with risks such as unauthorized access to sensitive information and inadequate legal frameworks, as noted by, (Almathami, 2020; Giebel, 2023; Rajkumar, 2023). Financial and organizational barriers, such as high setup costs, insufficient reimbursement policies, were also reported.

To overcome barriers, studies recommend investing in robust internet infrastructure to reduce disruptions during telehealth sessions. Simplifying telehealth platforms to ensure they are intuitive and accessible is emphasized, along with tailored training programs to enhance technical proficiency for providers and patients. Public funding and subsidies are also proposed to support telehealth setup and maintenance, particularly in low-resource settings facing technological limitations (Steindal, 2023; Almathami, 2020; Rettinger, 2023; Khan, 2024). To address usability barriers, studies recommend developing user-friendly telehealth systems and offering comprehensive training programs for healthcare providers to adapt to virtual care. Public awareness campaigns were also suggested to educate patients on telehealth benefits, reducing resistance and promoting acceptance. These initiatives aim to improve telehealth adoption across diverse populations (Steindal, 2023; Almathami, 2020; Khan, 2024). Financial and organizational barriers were addressed by expanding reimbursement policies, providing subsidies, and ensuring sustainable funding. Organizational support through streamlined protocols, administrative aid, and technical resources was emphasized to reduce provider workloads and enhance telehealth efficiency (Rettinger, 2023; Giebel, 2023; Khan, 2024). Building on global insights (Alamri, 2024),

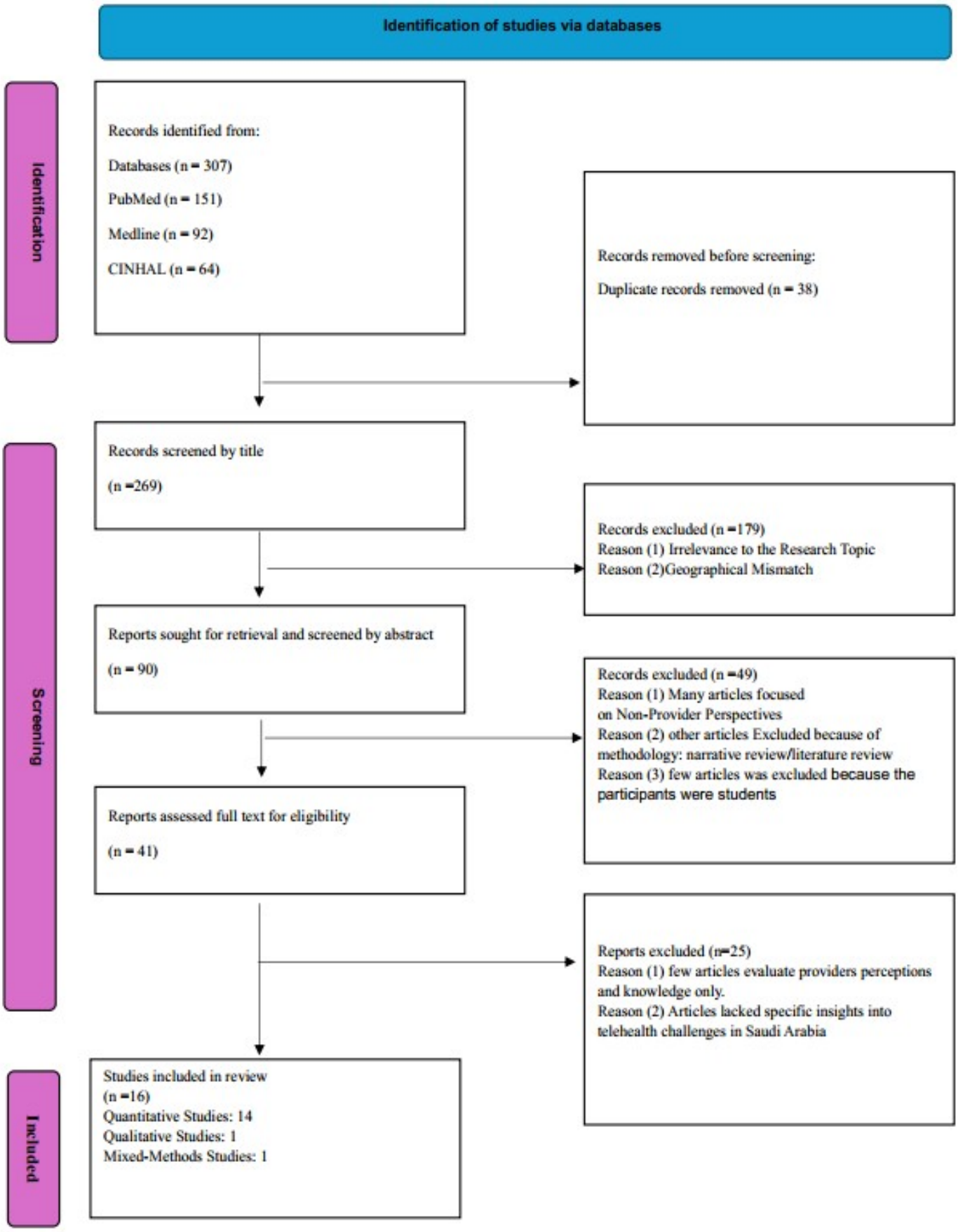

Figure 1. Systematic Review Diagram (PRISMA) which included all included studies

Table 1. Telehealth implementation challenge

Key theme	Description	Studies
Technological and infrastructure challenges	•Poor internet connectivity •Inadequate technological setups: healthcare providers reported not having the necessary equipment to support telemedicine •Poor telehealth infrastructure •System failures: Significant difficulties were reported in implementing telehealth effectively due to technical breakdowns. •Limited access to electronic health records: 86.8% of participants in one study struggled to retrieve patient records while using telehealth. •Reliance on non-specialized platforms: The use of platforms like WhatsApp and Zoom for telehealth services highlighted the limitations of existing tools.	(7) (8) (9) (10) (11) (12) (13) (14) (15)) (16) (17) (17)
Training and knowledge gaps	•Limited training among healthcare providers: One study found that only 12.7% of ophthalmologists had received training in teleophthalmology. •Inadequate digital health training during high-demand periods: During the Hajj season, only 25.7% of healthcare personnel felt they had received adequate training in digital health tools, while 37.4% emphasized the need for additional clinical training. •Reduced confidence in telehealth systems: residents reported less supervision, clinical practice, and discussion time compared to in-person instruction, affecting their overall learning experience. •Lack of knowledge about telehealth tools: Deficiencies in provider training were linked to a lack of familiarity with telemedicine technologies.	9 7 (18) (11) (8) (15)
Cultural and privacy concerns	• Concerns about data privacy: Practitioners and patients hesitated to adopt telehealth due to privacy issues, particularly with unencrypted applications like WhatsApp, complicating the acceptance of telemedicine. • Religious and cultural sensitivities: Some female patients were reluctant to use cameras during consultations due to religious and privacy concerns, with video-based interactions perceived as "haram" (religiously prohibited). • Language barriers: Expatriate caregivers face difficulties in communication. • Skepticism about confidentiality: Users expressed concerns over the inability to ensure privacy in a virtual environment, which could undermine trust in telehealth systems.	(8) (11). (19) (14) (20)
Diagnostic and assessment limitations	• Lack of comprehensive patient assessments: 75% of physicians in one study reported this as a primary challenge in telemedicine. • Difficulty in accurate diagnosis: one study reported that over 52% of physicians found it challenging to diagnose patients properly without in-person examinations. • Limited availability of diagnostic tools: The absence of tools like X-rays and laboratory tests further restricted healthcare providers' ability to deliver accurate care.	(17) (16) (9) (11) (20)
Patient-related barriers	• Lack of technical knowledge: Patients were unfamiliar with virtual consultation and telehealth services, affecting usability and satisfaction. • Trust and engagement concerns: Many patients felt uncomfortable discussing medical issues over telephone consultations, reducing their willingness to use telemedicine services	(9) (14) (21) (17) (8)
Time constraints and workload challenges	• Lack of time and busy schedules: 38% of participants cited in one study time constraints as the most significant barrier to telehealth adoption. • Strain during high-demand periods healthcare workers reported insufficient time to use digital health solutions during the Hajj season. • Overlapping telehealth consultations: 71% of physicians who work in telehealth consultation center "937"highlighted this as major issue • Increased workload concerns: Healthcare workers already have high workloads, and they feel the telehealth adds extra work. • Inadequate management support: healthcare providers emphasized the need for stronger administrative backing to enhance telehealth operations.	(7) (7) (21) (22) (7)
Legal and policy issues	• Lack of regulatory clarity: Unclear guidance left healthcare providers uncertain about the appropriate use of telehealth, leading to concerns over legal liabilities. • Concerns over legal frameworks: Healthcare workers identified unclear legal guidelines as a major barrier to sustainable telemedicine implementation.	(20) (8) (9) (14) (22)
Cost and resource limitations	• Need for financial investment: Studies highlighted the necessity of financial support to address infrastructure challenges and sustain telehealth services. • Unclear budgeting and limited financial support: Strategic planning and proper funding allocation were identified as crucial for overcoming telehealth adoption barriers.	(11) (20) (22)

provide recommendations tailored to Saudi Arabia, emphasizing significant financial investments and regulatory reforms to establish a strong telehealth infrastructure. Privatization is proposed to improve resource allocation and technological innovation. Raising awareness among healthcare staff and patients, alongside government-led incentives, is suggested to overcome resistance and resource gaps. Addressing cultural barriers through education and policy reforms is also crucial. These strategies highlight the need to align global best practices with Saudi Arabia's specific challenges.

Limitations: This research primarily focuses on identifying the challenges of telehealth implementation in Saudi Arabia, with limited exploration of solutions or strategies to overcome these barriers. Most included studies are cross-sectional, which limit the ability to evaluate long-term outcomes or trends in telehealth adoption. Furthermore, the findings are constrained by the lack of studies addressing the long-term impact of telehealth in Saudi Arabia, limiting the understanding of how these challenges evolve over time. Lastly, the absence of qualitative data restricts insights into the experiences of healthcare providers in Saudi Arabia.

CONCLUSION

This research systematically reviewed the challenges faced by healthcare providers in implementing telehealth in Saudi Arabia. The findings highlight several significant barriers, including technological limitations, insufficient training, cultural and privacy concerns, diagnostic constraints, and regulatory challenges. These issues hinder the widespread adoption and effective utilization of telehealth, despite its potential to enhance healthcare accessibility and efficiency. Addressing these barriers requires a multifaceted approach, including investment in robust digital infrastructure, implementation of clear legal frameworks, and development of user-friendly telehealth platforms. Additionally, training programs tailored to healthcare providers' needs and public awareness campaigns are essential for fostering acceptance and improving telehealth adoption. In conclusion, while telehealth offers significant opportunities to transform healthcare delivery in Saudi Arabia, overcoming these challenges is crucial to realizing its full potential. By implementing targeted solutions and aligning them with Saudi Vision 2030, telehealth can serve as a cornerstone for achieving equitable and efficient healthcare across the Kingdom.

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