

The Role of Telehealth in Improving Access to Healthcare Services for Rural Communities in KSA: A Nursing Perspective

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Abstract

Saudi Arabia recognizes the significant value of telemedicine for managing specific patient groups. There is a promising level of awareness, but some additional effort is needed to implement technology. Telemedicine aims to enhance the quality of medical treatment and the health of individuals receiving care. Various studies have demonstrated that healthcare quality has significantly enhanced globally through the utilization of telemedicine services in routine consultation programs. This study aimed to explore nurses' perspectives and attitudes investigate the role of telehealth in improving access to healthcare services for rural communities in Saudi Arabia for follow-up or continuous monitoring of chronic conditions. The findings of this study could facilitate a strong and thorough beginning in the practical application of this valuable technology. A descriptive, cross-sectional study was conducted from May to September 2022. The study utilized the author's questionnaire. The questionnaire was designed to assess willingness, general attitude towards telemedicine/telenursing, and their knowledge about it. The assessment included multiple-choice questions and close-ended questions. This study utilized a web-based surveying technology specifically designed for clinical telemedicine and e-health research. The precise number of people invited from different healthcare facilities was undisclosed. The average number of participants in nursing faculties is considered to be at least 100. Engagement in the online survey was optional and confidential. Most of the hospital's nursing workforce consisted of young individuals, including nursing students, junior nurses, staff nurses, and supervisors. Health care workers had diverse perspectives on their knowledge, perception, and attitude towards the scope of telemedicine in Improving Access to Healthcare Services for Rural Communities. The majority demonstrated a strong understanding of how telemedicine can help alleviate the challenges faced by chronic patients who frequently visit hospitals. Furthermore, the study group had a predominantly positive attitude towards telemedicine, believing technology may enhance the monitoring of chronic patients.

Keywords: telemedicine – telehealth - chronic conditions – remote areas – rural areas - nursing workforce

Research Background

Telehealth includes all aspects of remote healthcare, including as clinical services delivered through telemedicine, as well as interactions with automated services, systems, or information resources. Telehealth is the utilization of electronic information and telecommunications technology to provide distant clinical health care, patient and professional health-related education, public health, and health administration support (Shortliffe & Cimino, 2014).

Telehealth is used as a comprehensive word covering both clinical and nonclinical services, while telemedicine refers specifically to clinical services (Doarn et al., 2014). Telehealth has been successful in specialty health care services, and the utilization of technologies to communicate health information and offer care remotely is expected to become a common practice in health service delivery (Black et al., 2014; Hogan et al., 2011).

Nurses are increasingly using information technology (IT) as they expand their roles to provide nursing services in home settings. Telehealth nursing emphasizes patients' long-term well-being, self-care, and health (Shortliffe & Cimino, 2014). The American Telemedicine Association states that this IT solution allows nursing care to be delivered remotely, enabling care providers to monitor, educate, follow-up, collect data, and offer multidisciplinary care, including remote interventions, pain management, and family support in a creative manner. Agencies utilizing telemedicine have an average patient-to-nurse ratio of 15:1, while agencies not using telehealth have a ratio of 11:1 (Mahoney, 2020).

Telehealth nursing can significantly improve patient care in rural or underserved locations with nurse shortages and limited resources (Black et al., 2014). Furthermore, in rural areas, numerous patients have delays in receiving healthcare interventions due to the absence of specialized services. Home health organizations equipped with telehealth technology can provide care for patients with chronic illnesses in their own homes, addressing this need. This offers convenience and a feeling of safety to the patient, enabling prompt nursing interventions under the supervision of a physician (Mahoney, 2020; Doarn et al., 2014).

Research Problem

Rural communities in Saudi Arabia encounter obstacles in obtaining healthcare services due to factors such as remote healthcare facilities, scarcity of healthcare personnel, and inadequate infrastructure (Alfaqeeh et al., 2017). Geographical distance to healthcare services is a significant obstacle that can lead to delayed diagnosis and treatment for people living in rural locations (Ambroggi et al., 2015). A research in the Al-Qassim region of Saudi Arabia revealed that residents in remote communities faced challenges accessing healthcare due to having to travel considerable distances to reach the nearest healthcare center. This resulted in delays in seeking care for acute disorders and chronic diseases (Alfaqeeh, 2015).

Rural communities frequently lack sufficient healthcare providers, especially specialists, which might impede access to specialized care. A study conducted in the Eastern Province of Saudi Arabia emphasized the lack of healthcare experts in rural areas, resulting in extended wait times for specialist appointments and restricted access to specific medical treatments (Asmri et al., 2020).

Poor road conditions and limited transit alternatives in rural areas can create logistical obstacles for individuals trying to access healthcare services. This may lead to missed appointments, challenges in accessing emergency care, and reduced utilization of healthcare services in remote areas. These obstacles lead to postponed diagnosis and treatment, restricted availability of specialized care, and poor health outcomes for those living in rural areas (Liu et al., 2021).

Telehealth has been suggested as a potential way to enhance healthcare access for rural people in Saudi Arabia. Telehealth technology, including teleconsultations, remote monitoring, and tele-education, can facilitate communication between healthcare providers and patients in distant locations (Al-Hazmi et al., 2021). A pilot telehealth program in the Asir region of Saudi Arabia showed the feasibility and usefulness



of employing teleconsultations to offer primary care services to residents in rural areas, thus decreasing the necessity for patients to travel significant distances for medical appointments (Alkhalifah & Aldhalaan, 2018).

Telehealth is being used to enhance healthcare access for rural areas through remote consultations, monitoring, and education. The extent to which telehealth is utilized and its impact in rural Saudi Arabia, especially from a nursing viewpoint, is not fully comprehended. It is necessary to investigate how telehealth can help reduce disparities in healthcare in rural areas and to determine the elements that affect its adoption and acceptance by patients and healthcare providers in these regions (Alaboudi et al., 2016). Hence, it is necessary to investigate the impact of telehealth on reducing healthcare inequalities in rural Saudi Arabia, particularly focusing on the viewpoints of nurses who are essential in providing healthcare to rural areas. This research aims to explore the obstacles, advantages, and difficulties of implementing telehealth in rural communities in Saudi Arabia. The objective is to offer valuable insights that can guide policy decisions and strategies to improve access to quality healthcare services for residents in underserved areas.

Research Questions:

- What are the current barriers to accessing healthcare services for rural communities in Saudi Arabia?
- How can telehealth be utilized to improve access to healthcare services in rural areas?
- What are the perceptions and attitudes of healthcare providers and patients towards telehealth in Saudi Arabia?
- What are the potential challenges and opportunities for implementing telehealth in rural communities in Saudi Arabia?

Aim & Objectives

The aim of this study was to investigate the role of telehealth in improving access to healthcare services for rural communities in Saudi Arabia, with a focus on the perspectives of nurses.

Research Objectives:

- To identify the specific barriers that hinder access to healthcare services for rural communities in Saudi Arabia.
- To explore the potential benefits and challenges of integrating telehealth into the healthcare system to improve access for residents in rural areas.
- To examine the attitudes and perceptions of nurses towards telehealth in rural Saudi Arabia.
- To assess the factors influencing the implementation and acceptance of telehealth in rural communities in Saudi Arabia and propose strategies for overcoming barriers.

Research Significance

This research is important because it offers useful insights into the potential of telemedicine in reducing healthcare inequities in rural populations in Saudi Arabia. This study's results can guide healthcare policies and practices to improve access to high-quality care for individuals in underserved regions. The study can enhance the existing knowledge on the deployment and acceptance of telehealth among healthcare providers, namely nurses, in rural areas.



Literature Review

Telemedicine is the utilization of electronic information and communication technology to deliver and facilitate healthcare services while individuals are geographically separated (Kazley et al., 2012). Telemedicine refers specifically to the utilization of these technologies for providing direct health treatments to patients. Telehealth encompasses a wide range of health-related services that utilize electronic information and communication technologies, including telemedicine, health information sharing, health professional and patient education, and remote or mobile patient monitoring (Haleem et al., 2021).

Telemedicine typically includes three main types of applications: live interactive video conferencing (synchronous), store-and-forward (asynchronous) transmission of medical images and/or information, and remote patient monitoring. Live telemedicine entails immediate, interactive communication between a patient and a healthcare professional and is primarily utilized for outpatient specialized medical consultations (Khandpur, 2017). Multiple studies have shown that this form of treatment leads to high-quality care, with high satisfaction rates expressed by clinicians, patients, and caregivers (Orlando et al., 2019; Prahalad et al., 2018; Hilt et al., 2015).

Store-and-forward telemedicine entails a professional examining a documented health history together with digital images or video. Common instances include tele-echocardiography (Webb et al., 2013), tele-dermatology (Fogel & Teng, 2015; Philp et al., 2013), and tele-retinal screening (Almadhi et al., 2022). Remote patient monitoring is the process of transmitting personal health and medical information to a healthcare professional for tracking purposes, including symptoms, vital signs, and laboratory data. Remote patient monitoring frequently employs mobile technologies and has demonstrated efficacy in producing care outcomes comparable to in-person care for numerous chronic conditions (Herendeen & Deshpande, 2014).

Telemedicine initiatives are gaining acknowledgment and backing globally, facilitating a patient-focused method where people are actively involved with their healthcare providers in clinical decision-making for improved health results (Baker, 2001). Cutting-edge technology is influencing the healthcare sector in both developed and developing nations. Saudi government hospitals, community care facilities, primary care settings, and private health organizations in Saudi Arabia are extensively utilizing various digital technology. In Saudi Arabia, telemedicine is gaining recognition as a modern method of healthcare delivery in alignment with worldwide patterns (Haleem et al., 2021).

The overall population of Saudi Arabia, including foreigners, exceeds 32.5 million, with around 18% living in rural and remote areas of the country. In 2013, the kingdom's population was 28.7 million, with 8 million being expatriates. The population is projected to reach over 40.4 million in 2050, with 18.4% being over 65 years old. Telemedicine services can enhance and reinforce existing healthcare facilities to meet the increasing need of the population (Region, 2017).

There is a growing need for high-quality healthcare in rural regions. Healthcare professionals in remote locations may lack the qualifications to handle complex cases and severe illnesses. Telemedicine can help bridge the healthcare gaps between rural and urban areas. Telemedicine can greatly enhance patient satisfaction rates.

Telemedicine has the potential to offer healthcare services to individuals with persistent chronic illnesses such as mental illness, obesity, diabetes, disability, oral health difficulties, hypertension, osteoarthritis, cardiovascular problems, and osteoporosis. Telehealth consultations can help lessen the impact of chronic diseases by encouraging the Saudi community to focus more on prevention rather than treatment. Greater focus should be directed towards disease prevention rather than therapy (Haleem et al., 2021).

Patients can get care at their residence or place of work, reducing the number of individuals visiting and the length of hospital stays. Telemedicine preventive services are desperately needed to reduce the



prevalence of chronic diseases in the Kingdom. It is cost-effective and has the potential to significantly reduce mortality and morbidity from chronic diseases, leading to an improved health-related quality of life (Haleem et al., 2021).

The Ministry of Health has started multiple measures to introduce the e-health system, which will assist healthcare providers in accessing patient health information at any time and from any location. MOH professionals offer 24/7 telephonic medical consultations to patients by dialing 937. The Ministry aims to offer telemedicine services across the kingdom and has introduced the "Sehha" smartphone application. This software allows patients to interact with their healthcare professional remotely for medical consultations via video, voice, and text messages. This allows the patient to access several healthcare specialists in remote and rural regions of the country. This program has the potential to decrease medical and diagnostic errors, perhaps influencing the health-seeking behavior of the Saudi populace (Alharbi et al., 2021).

Saudi Arabia recognizes the significant value of telemedicine for managing specific patient groups. There is a promising level of awareness, but some additional effort is needed to implement technology (Nasser, 2017). Telemedicine aims to enhance the quality of medical treatment and the health of individuals receiving care. Various studies have demonstrated that healthcare quality has significantly enhanced globally through the utilization of telemedicine services in routine consultation programmes (Albarrak et al., 2021; Chau & Osborne, 2017). This study aimed to explore nurses' perspectives and attitudes towards the effectiveness of telemedicine for follow-up or continuous monitoring of chronic conditions. The findings of this study could facilitate a strong and thorough beginning in the practical application of this valuable technology.

Methodology

Research Design

This study utilized a descriptive, cross-sectional approach using quantitative data collection method from May to September 2022 to provide a comprehensive understanding of the role of telehealth in addressing healthcare disparities in rural Saudi Arabia. The quantitative component involved surveying healthcare providers, including nurses, to assess their attitudes and perceptions towards telehealth.

Sampling Strategy:

A purposive sampling strategy was used to select participants for the study. Healthcare providers (nurses), working in rural healthcare facilities in Saudi Arabia, were invited to participate in the survey to gather quantitative data on their attitudes towards telehealth to provide rich insights into the implementation of telehealth in rural communities. The precise number of people invited from different healthcare facilities was undisclosed. The average number of participants in nursing faculties is considered to be at least 100. Engagement in the online survey was optional and confidential. Most of the hospital's nursing workforce consisted of young individuals, including nursing students, junior nurses, staff nurses, and supervisors.

Data Collection Methods:

Quantitative data was collected through an online survey distributed to healthcare providers, including nurses, using a structured questionnaire. The survey included items related to attitudes towards telehealth, perceived barriers and benefits of telehealth, and experiences with telehealth technologies in rural healthcare settings. The questionnaire was designed to assess individuals' willingness, general attitude towards telemedicine/telenursing, and their knowledge about it. The assessment included multiple-choice questions and close-ended questions. This study utilized a web-based surveying technology specifically designed for clinical telemedicine and e-health research.

Data Analysis:

Quantitative data from the survey was analyzed using descriptive statistics to summarize the attitudes and perceptions of nurses towards telehealth to identify key themes and patterns related to the barriers, benefits, and challenges of telehealth implementation in rural Saudi Arabia. The data analysis was conducted using SPSS version 19. We tabulated the frequencies for the nominal scale responses and computed the means and standard deviations for the continuous scale data. This study adhered to the regulations of the local health service and research ethics norms. The questionnaire's reliability was assessed by Cronbach's alpha, yielding a result of 0.87. Data triangulation was used to compare and contrast the findings from the quantitative data sources to provide a comprehensive understanding of the research questions and objectives.

Ethical Considerations:

Ethical approval was obtained from the relevant institutional review board before commencing data collection. Informed consent was obtained from all participants, and their confidentiality and anonymity was ensured throughout the study. Data storage and management procedures complied with data protection regulations to safeguard the privacy and confidentiality of participants.

Results & Discussion

Our study had an 85% response rate. A total of 164 participants responded to our questionnaire. Of the nurses surveyed, 46.7% were students, while the rest held positions such as supervisor, senior nurse, and staff nurse. There were 283 full-time workers, constituting 90% of the total workforce, and 30 part-time workers, making up 10%. Most participants (92%) assessed their knowledge of telemedicine as either advanced or moderate. 53% of participants in the research believed that telemedicine is more beneficial for chronic medical patients, while 25.4% thought it was more useful for general medical cases. Health care workers had diverse perspectives on their knowledge, perception, and attitude towards the scope of telemedicine. The majority demonstrated a strong understanding of how telemedicine can help alleviate the challenges faced by chronic patients who frequently visit hospitals. Furthermore, the study group had a predominantly positive attitude towards telemedicine, believing technology may enhance the monitoring of chronic patients. The majority of participants also favored patient-nurse confidentiality. The students and staff nurses had a more positive attitude compared to the senior nurses and supervisors, with no significant difference in knowledge and perspective. The knowledge and perception of our participants regarding the area of the utility of telemedicine were statistically significant (P value = 0.025 and P value = 0.025, respectively)

According to a recent survey, 66% of physicians in Saudi Arabia expressed concerns over the diagnostic accuracy of telemedicine (Kaliyadan et al., 2020). Prior research found similar levels of accuracy in diagnosing skin malignancies, diabetic retinopathy, burns, muscle tear, dementia, and uncontrolled hypertension comparing face-to-face and tediagnosis. This accuracy is likely linked to the quality of video and audio in online consultations, the presence of up-to-date equipment in healthcare facilities, and the availability of healthcare professionals experienced in telemedicine.

Prior research conducted in Saudi Arabia found that the voice and video quality in the majority of online consultations was acceptable, while some technical difficulties arose. However, the presence of telemedicine equipment in Saudi healthcare facilities and training healthcare personnel to utilize telemedicine effectively continue to be challenging (Mubaraki et al., 2021; Kaliyadan et al., 2020).

Moreover, telemedicine was demonstrated to be a secure method. A meta-analysis demonstrated that telemedicine can safely assist in glucose monitoring for diabetic patients, follow up with patients with hypertension, provide guidance to junior physicians in neonatal critical care and emergency departments, and triage patients in neurosurgery.

Telemedicine is viewed as cost-effective in various aspects when compared to in-person consultations. It minimizes transit time, inpatient visits, referrals to higher-level healthcare facilities, missed productivity, costs of companions for youngsters and patients with disabilities, and downsides associated with delayed diagnosis. In a prior research of physicians in Saudi Arabia, over two-thirds believed that telemedicine was cost-effective during the COVID-19 epidemic, but the assessment of cost-effectiveness in that study was subjective (Kaliyadan et al., 2020). Therefore, more research is needed to examine the cost-effectiveness of telemedicine in both public and commercial healthcare settings in Saudi Arabia.

It is necessary to obtain informed consent before doing a traditional clinical examination or telemedicine. Due to the unique characteristics of telemedicine, patients must comprehend the regulations concerning the utilization of cameras, storing talks and images, and exchanging health information with other medical professionals (Langarizadeh, et al., 2017).

Signing informed consent in telemedicine may be required in some circumstances, either by signing a physical informed consent document and scanning it for submission to the healthcare provider, or by signing an electronic form. For both cases, a thorough explanation, whether online or in a video format, is required to outline the process of telemedicine (Langarizadeh, et al., 2017; Balestra, 2018). The authorities in Saudi Arabia should update laws regulating telemedicine, establish clear legislation on

patient consent, determine guidelines for saving or deleting telemedicine consultation data, and establish protocols for sharing medical information, including photos, between general practitioners and specialized physicians for second opinions.

Saudi Arabia has seen significant growth in its healthcare sector during the past few decades. SEHA and other telehealth technologies enable the dissemination of advanced nursing and medical practices from several hospitals and community centres to remote locations. Technology is revolutionising nursing education to fit modern needs. Ahmed et al. and Thapa et al. discovered a strong approval of telemedicine among nursing students, suggesting the possible evolution of nursing practice. Research suggests that telehealth can be utilised to educate and improve health literacy among the general population. These factors suggest enhancement in nursing care and quality.

Evidence shows that telehealth improves the quality of nursing practice. Ahmed et al. (2021) discovered that nurses and doctors showed enthusiasm and a preference for utilizing telemedicine to care for patients with chronic diseases. The technology improves the capacity to promptly monitor and address patients' needs without requiring them to attend healthcare institutions. Aloraini (2017) could not find a correlation between telemedicine and decreased mortality in the ICU.

Bashir & Bastola (2018) found that telemedicine greatly enhanced nursing quality by improving communication, managing service users, promoting patient autonomy, and allowing patient monitoring. The statements align with the research findings of Thapa et al. (2021), Alkamel et al. (2020), and Abolfotouh et al. (2019), who observed a strong inclination towards mobile applications or ICT in healthcare administration and practices. Al-Marashi and Al-Zghool (2018) identifies nursing as a demanding profession marked by burnout and heavy workloads. Adopting telehealth can help alleviate these issues and provide smooth care for patients in KSA.

Conclusion

Nurses in KSA encounter issues related to burnout and workload, which can be alleviated by the use of telehealth, as indicated by the analysis results. Addressing these difficulties improves the quality of care and boosts nurse satisfaction. Nurses in KSA have varying levels of understanding regarding telehealth, particularly with the introduction of the SEHA app to support remote healthcare services in the country. Telehealth enables nurses to establish relationships with service users through a communication platform. These factors contribute to promoting patient-centered care. This aspect has helped augment healthcare quality through self-management and improved patient outcomes. Additional data of superior quality and more rigorous methods is required to elucidate the long-term effects.

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