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The Role of Telenursing in Addressing Nursing Sector Challenges and Improving Healthcare in Saudi Arabia

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Abstract
The healthcare sector has undergone a major transformation due to technological advancements, and telenursing is one of the most important manifestations of this transformation. Telenursing relies on the use of digital devices such as smartphones and remote monitoring devices to deliver nursing and healthcare services in innovative and effective ways. In Saudi Arabia, the shortage of nursing staff is one of the biggest challenges, with Saudi nationals making up only about 38% of the total nurses. Saudi Vision 2030 represents an opportunity to adopt telenursing technologies to expand the scope of healthcare, improve its efficiency, and reduce costs. This review aims to highlight the role of telenursing in improving the quality of healthcare, addressing the shortage of nursing staff, and enhancing the patient experience, especially during health crises.
Keywords: Telenursing, Nursing Shortage, Health Technology, Saudi Arabia.

Introduction

Recently, modern technology has contributed to the transformation of the healthcare landscape [1].Telenursing is a scene of technological transformation in healthcare, as it relies on the use of digital devices such as wearables, smartphones, remote monitoring devices, and video calls to provide nursing care to patients [2]. Telenursing also allows nursing care and consultations to be provided to patients through electronic platforms, which contributes to improving access to care, enhancing quality of life, and reducing costs incurred by health systems [3].

In Saudi Arabia, the health system faces several challenges, including population growth, high rates of chronic diseases, and the spread of infectious diseases, which impose challenges on nurses in providing nursing care [4]. In addition, the Saudi health system suffers from a shortage of Saudi

nurses, with Saudis making up only about 38% of the total nurses, which imposes challenges on nurses in disasters and health crises that may lead to the withdrawal of non-Saudi nurses [4,5].
Saudi Vision 2030 comes as a strategic opportunity to transform the nursing sector into a global model to be emulated, by promoting the localization of the profession, improving the work environment, and developing innovative training programs [6]. Accordingly, telenursing is an effective tool to bridge the gaps in the Saudi health system related to the shortage of Saudi nurses [7]. In addition to providing healthcare and nursing care, telenursing contributes to training and qualifying nurses, enhancing education, and expanding the scope of nursing research, which helps in building a strong and sustainable health system [8].
Telenursing also offers patients the flexibility to receive care from home and provides a secure platform to communicate with nurses and caregivers. These technologies have become a necessity to overcome the obstacles faced by patients in rural areas, those with chronic diseases, or those with mobility disabilities [9].Studies show that telenursing enhances nurses' ability to manage chronic conditions that require continuous follow-up and patient education, which reduces hospital readmissions and health care costs [10].Future challenges in telenursing are the ability of health systems to keep pace with technological advances and to train and qualify nurses and health care providers to leverage technology to implement telenursing care [9,10].
This review aims to reveal the role of telenursing in addressing the challenges facing the nursing sector in the Kingdom of Saudi Arabia, improving healthcare and nursing, and enhancing the patient experience, especially during crises and pandemics.

Overview of Telenursing

Telenursing is a branch of telemedicine that uses digital technologies such as smartphones, video conferencing, and remote monitoring devices to provide nursing care to patients effectively without the need for direct contact between the nurse and the patient [11]. Telenursing contributes to providing innovative solutions to improve access to health and nursing care for patients with chronic diseases, the elderly, and patients in peripheral areas. The benefits and applications of telenursing include:

- Access to rural and remote areas.
- Remote monitoring of chronic health conditions.
- Health education and awareness raising among patients.
- Reducing direct contact between the nurse and the patient in epidemics.

Accordingly, telenursing contributes to overcoming geographical barriers and ensuring the provision of nursing care and effective communication with patients, which achieves comprehensive health care and improves patient outcomes [12].

Telenursing Models: The Evolution of Technology in Nursing Practice

There are several technology models used to deliver telenursing services in nursing practice, and each model is designed to meet specific healthcare needs using digital technology. The most popular models are:

Store-and-forward model:

This model relies on collecting and storing medical data digitally and then sending it to healthcare providers when needed. Examples include radiology images (MRI, CT scans, and X-rays), laboratory test results, and physiological data such as vital signs. This model allows diagnostic and therapeutic services to be provided without the patient having to be present on-site [13].

Live video conferencing:

This model relies on advanced communications technologies such as real-time audio and video. It allows direct communication between patients and healthcare providers, making it useful for psychological care, emergency situations, health education, and chronic disease management. Computers, microphones, and cameras are used to conduct these conferences [14].

Remote monitoring:

Medical data is collected remotely using digital technologies, such as smart monitoring devices, and then transmitted to healthcare providers in specialized centers [15]. This model is effective in monitoring patients with chronic diseases such as heart disease and diabetes.

Mobile health (MHealth):

This model focuses on the use of smartphones or mobile devices to deliver healthcare services. Data such as vital signs, test results, or patient information can be collected daily from the patient’s home, providing more regular access to healthcare [16].

Wearable devices:

Wearable devices are technologies that support remote nursing, allowing accurate health data to be collected continuously without the patient having to be present in a medical facility. These devices are used to provide real-time information about a patient's health status, helping to make quick and effective decisions [17].

The role of telenursing in reducing the nursing shortage

Telenursing contributes to addressing the nursing shortage by providing innovative services that enhance the efficiency and sustainability of healthcare.

Home care: Telenursing allows monitoring of patients in their homes, especially the elderly and those with special needs or chronic diseases such as diabetes and heart disease. This doubles the number of patients a nurse can care for daily compared to traditional care [18].

Telephone triage: Telephone calls are used to assess patients' symptoms and provide advice on appropriate steps, such as visiting the emergency room or following up on home care. This model helps reduce unnecessary visits to the emergency department, which reduces pressure on hospitals and reduces healthcare costs [19].

Management of chronic health conditions: Telenursing applications help patients with chronic diseases monitor their health status continuously, such as monitoring blood pressure or blood sugar levels. This contributes to improving adherence to the treatment plan and reducing symptoms through direct instructions from nurses [18,20].

Pregnancy and newborn care: Nurses can provide medical advice to pregnant mothers and monitor the health of mothers and newborns. These services allow for follow-up of vital checks and education on preparing for childbirth and aftercare [21].

Pre- and post-operative patient care: Telenursing is used to prepare patients before surgery through direct guidance, and to follow up on their condition after surgery using reports sent via images or video [22]. This type of care allows for early detection of any complications and enhances the recovery process.

Mental health: Telenursing applications are used to provide mental health services through live video sessions with nurses or specialists. This service is especially important in areas with a lack of mental health resources and helps reduce anxiety and enhance resilience in the face of crises [23].

Advantagesof Telenursing

Telenursing offers innovative solutions to many of the challenges facing healthcare, particularly the shortage of nursing staff. This approach helps improve efficiency, reduce costs, and increase patient satisfaction by providing high-quality services.

Remote Care Delivery: Telenursing enables nurses to deliver care using technology such as remote monitoring and video conferencing [12]. This technology allows nurses to regularly monitor patients' condition using wearable devices, improving access to care in remote areas.

Cost Savings: Telenursing contributes to reducing healthcare expenditure, as the costs of emergency visits and hospital admissions are reduced [11].

Improving Bed Allocation: Telenursing can relieve pressure on hospitals by reducing hospital readmissions. Studies show that remote monitoring of patients, especially those with chronic conditions or after surgery, contributes significantly to improving bed allocation and relieving pressure on medical staff [24].

Reaching Remote Areas: Telenursing supports healthcare delivery in rural areas, where hospitals face the challenges of closure or lack of resources. This model can expand health coverage and reduce waiting times, enhancing the comprehensiveness and quality of care [8].

Barriers to Telenursing Implementation

Technological challenges: Poor infrastructure such as slow internet and lack of modern digital devices, especially in remote areas, limit the effectiveness of telenursing [25].

High cost: The costs of technology and devices required for telenursing implementation are high, making them not easily available in resource-limited areas [26].

Limited access: Some patients face difficulty using technology due to lack of resources or internet.

Resistance to change: Reliance on traditional methods and lack of confidence in technology hinder the adoption of telenursing by patients and caregivers [27].

Provider skills: Lack of training in the use of digital tools among nurses leads to difficulties in providing telenursing services efficiently [27].

Conclusion:

Telenursing is a modern innovation that addresses the challenges facing nurses and healthcare workers, especially the shortage of nursing staff. The adoption of technologies such as remote monitoring, video conferencing, and wearable devices can expand the reach of healthcare services, improve the quality of care, and reduce costs. Under its Vision 2030, Saudi Arabia has an opportunity to transform telenursing into a key tool to support its healthcare system, by promoting localization, improving the work environment, and investing in staff training. However, telenursing applications face challenges including infrastructure, costs, and community acceptance. Overcoming these challenges requires strategic investment in technology, education, and awareness to ensure the delivery of sustainable healthcare services.

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