

Telehealth, a component of modern healthcare services

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Editorial

Driven by advancing technology and digitalization, healthcare services are undergoing profound changes, and the integration of communication technologies into the medical field is accelerating. These developments are spreading globally with the aim of facilitating access to healthcare, enhancing sustainability and quality, and reducing costs.

Technological advancements have led to significant improvements in the delivery of healthcare services, giving rise to new methods. A key milestone in this evolution occurred in 1905 when the Dutch physician Dr. Willem Einthoven successfully transmitted electrocardiography data over telephone lines, marking the emergence of the concept of telehealth. "Remote health applications" are defined within a framework that encompasses the use of electronic tools and communication technologies for clinical health approaches, the training of patients and healthcare personnel, the promotion of public health, and the implementation of health policies. In this context, telehealth refers to the use of telecommunication tools to carry out clinical diagnosis, treatment, and monitoring processes regardless of distance. Since the beginning of the 21st century, advancements in information technology have paralleled developments in medicine, paving the way for new concepts such as "telehealth," "mHealth," and "eHealth".¹

Within this framework, prominent telehealth applications have established a new paradigm in healthcare delivery by enabling individuals to access health services regardless of geographical boundaries. By definition, telehealth is the use of electronic information and telecommunications technologies to support and promote long-distance healthcare services, health-related education for patients and healthcare professionals, public health, and health administration.

The remote delivery of healthcare services using Information and Communication Technologies has attracted significant interest, a process that has accelerated with the recent global pandemic. Commonly referred to as "telehealth," this approach encompasses a wide range of technologies, including telephone, video, email, remote monitoring, mobile and wearable applications, and web portals. Video and telephone consultations appear to be the most common real-time telehealth methods.

When determining the most suitable telehealth models, it is essential to consider findings from service delivery, user satisfaction levels, and the specific advantages and disadvantages of each telehealth model. For instance, tele-rehabilitation programs utilize two types of communication approaches for service delivery: asynchronous and synchronous. Asynchronous communication refers to a strategy where the patient and the healthcare provider communicate with each other outside of the moments when the patient is actively performing an intervention. Synchronous communication, on the other hand, employs a strategy based on real-time interaction between the patient

and the healthcare provider, typically for activities such as exercises or education.

The concept of telehealth is closely linked to the World Health Organization's (WHO) global health policies. According to the WHO's definition, telehealth is described as "the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment, and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, with the aim of advancing the health of individuals and their communities" (World Health Organization, 2010).² As this definition implies, telehealth is considered an umbrella term encompassing a wide range of remote health services. In this context, various digital solutions—such as video conferencing systems, secure messaging infrastructures, internet-based platforms, and mobile applications—are utilized.

As of 2021, 72% of primary care physicians in the US had seen patients via telehealth. Furthermore, 81% of family physicians and general practitioners utilized systems equipped with telehealth capabilities. In the UK, 28% of doctors saw at least 75% of their patients via telehealth in 2022. Spain is among the European countries where telehealth services are widely used; during the 2020–2021 period, 72% of the population received medical consultations online or by telephone. Saudi Arabia is home to the Seha Virtual Hospital, the world's largest virtual hospital. This facility operates in coordination with 240 hospitals and provides services across 48 medical specialties.³

Common areas of telehealth application include radiology, cardiology, rehabilitation and pathology. The success of these systems depends largely on patient satisfaction and service effectiveness. Shortcomings in these areas can lead to significant cost increases and outcomes that compromise patient safety.

Globally, inequalities in access to healthcare services constitute a significant public health issue, particularly among rural populations. Rural residents face numerous obstacles, including geographical isolation, low income, limited transportation, a shortage of healthcare professionals, and inadequate healthcare service provision; these factors directly impact health outcomes. Consequently, telehealth services serve as a tool to enhance accessibility and improve care

in rural areas. However, sustainable implementation requires priority investments in infrastructure, digital literacy programs, comprehensive legal frameworks, and robust cybersecurity measures. Remote healthcare services in rural regions have improved access to healthcare professionals, increased patient satisfaction, and enhanced treatment outcomes.

In summary, the significant benefits that telehealth systems provide in rural areas include:

- I. Mitigating distance-related issues: Providing access to specialist support in hard-to-reach areas.
- II. Saving time and costs: Eliminating travel and accommodation expenses.
- III. Enhancing support across various specialties: Enabling local physicians to collaborate with specialists in different fields via telehealth.
- IV. Facilitating the monitoring of chronic diseases: Proving particularly effective when methods such as remote monitoring are integrated into patient care.

Today, there is also a substantial body of research documenting the positive impact of health information technology on the efficiency and effectiveness of healthcare delivery.

As for the limitations of telehealth services, they include:

- I. Inadequate technological infrastructure
- II. Low digital literacy
- III. Data security and ethical concerns
- IV. Insufficient telehealth training for healthcare professionals

Unique challenges associated with integrating telehealth into the complex care processes of specific patient groups, such as those with chronic diseases.

Recommendations and conclusion

Telehealth enables remote consultation, diagnosis, and monitoring by bridging the gap between healthcare providers and patients. It aims to overcome challenges associated with face-to-face visits and address geographical disparities in healthcare resources, thereby reducing treatment delays, lowering morbidity and mortality rates, and improving patients' quality of life.

However, telehealth alone is insufficient; a hybrid approach—combining telehealth with traditional healthcare services—represents the most balanced and effective solution. It is crucial to develop inclusive and resilient future healthcare systems through hybrid models that integrate traditional care with telehealth, alongside culturally adapted, patient-centered solutions. Technological advancements and digital transformation offer promising opportunities to overcome these challenges. Telehealth, a key component of this transformation, has emerged as a critical solution for surmounting geographical and physical barriers through remote service delivery. Future studies should prioritize cost-effectiveness analyses and examine the long-term impact of hybrid care models on patient outcomes across diverse settings.

For sustainable and effective remote healthcare services in rural areas:

- I. Strengthening internet and electricity infrastructure,
- II. Organizing training programs to improve digital health literacy,
- III. Expanding the use of mobile telehealth teams in rural areas,
- IV. Strengthening data security and ethical standards.
- V. Development of services adapted to local languages and cultures, as demonstrated by successful programs in countries like China and South Africa.
- VI. International collaborations should be expanded to share results and best practices derived from diverse national experiences.

Furthermore, individuals with visual, speech, or hearing impairments, cognitive issues, or mobility limitations may face additional barriers regarding telehealth access and participation. Consequently, there is a need for initiatives that prioritize adapting telehealth-based applications to ensure equitable access for all.

The advantages of telehealth, such as time and cost efficiency, have led to high levels of patient satisfaction. Additionally, telehealth facilitates virtual monitoring for rehabilitation, psychotherapy, and advanced treatments. It fosters interdisciplinary collaboration by overcoming geographical, transportation, and financial barriers, while offering training and educational opportunities for physicians and healthcare workers in developing regions.

It has also been observed that there are limited resources and a lack of comprehensive understanding regarding the selection of the most appropriate telehealth methods within general healthcare services.

In conclusion, telehealth is an innovative model with the potential to reduce spatial and structural barriers to healthcare access. Experts predict that telehealth will shape the future of medicine over the coming decade and view its prospects with optimism. Driven by inevitable technological advancements and an aging population, telehealth is set to see expanded application areas and establish itself as a key strategy in healthcare delivery in the years ahead.^{4,5}

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Conflicts of interest

The author declares there is no conflict of interest.

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