

The Role of Tele pharmacy in Providing Medication Access and Care-Research Question: What is the Role of TelePharmacy in Healthcare Accessibility?

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Abstract

Telepharmacy has emerged as an important solution for improving healthcare accessibility, particularly in underserved and rural areas where pharmacy services are limited. It uses digital communication technologies to allow pharmacists to provide remote medication dispensing, counseling, and monitoring. This approach helps patients receive timely pharmaceutical care without the need to travel long distances. Telepharmacy also supports healthcare systems by improving medication management, reducing errors, and enhancing patient adherence to treatment. Furthermore, it enables collaboration between pharmacists and other healthcare professionals, ensuring better patient outcomes. Overall, telepharmacy plays a significant role in expanding access to safe, efficient, and patient-centered pharmaceutical services.

Keywords: Telepharmacy • Healthcare accessibility • Remote pharmaceutical care • Medication managements • Digital health

Introduction

During the 20th century, the use of information and telecommunication technologies has expanded at a rapid rate [1]. In this case, it has critically influenced healthcare delivery in many countries—wherein the availability of the internet has created more informed consumers who demand more of healthcare professionals. That said, technology has emerged as a potential means to overcome some of these obstacles to patient care. On one hand, pharmacies are an important structure of the health system—offering health services in a capillary way due to their wide diffusion at least in industrialized countries [2]. Therefore, the application of Information and Communication Technologies (ICTs) to the health sector can open new perspectives in the delivery of health services—potentially limiting the problem of decreased availability of health professionals.

Telepharmacy, a concept that refers to pharmaceutical service provision, enables healthcare services by a qualified pharmacist for patients located at a distance from a remotely located hospital, pharmacy, or healthcare center. According to Alonazi et al., it has emerged as a transformative solution in modern healthcare—leveraging technological advances to deliver pharmacy services and patient care remotely. As part of telehealth, telepharmacy addresses healthcare disparities—enhancing accessibility, reducing costs, and improving

medication management. According to Baldoni, it has been adopted to provide pharmaceutical services to underserved areas and to address the problem of pharmacist shortage. That said, telepharmacy involves experiences with particular attention to those in some way different to the conventional pharmaceutical service.

In essence, telepharmacy has numerous recognizable benefits, especially in terms of providing convenient access to healthcare services in remote and rural locations, economic benefits, patient satisfactions, and minimal scarcity of local pharmacist and pharmacy services. However, it still faces challenges such as regulatory barriers, technological limitations, workforce adaptation, patient engagement issues, and data privacy concerns [3]. Thus, delving deeper about the role of telepharmacy is highly crucial in order to resolve existing concerns about healthcare accessibility and scarcity of pharmacists and pharmacy services; along with improving patient satisfaction.

Objective (Purpose of your scoping review): The objective of this scoping review is to summarize and provide a practical guide for the implementation and use of pharmaceutical care through such practice, specifically by healthcare professionals and patients in its different scopes of application. In line with this, this review shall explore the role, benefits, and limitations of telepharmacy including

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digital health interventions—to be able to provide a comprehensive understanding of their impact on pharmacists and healthcare systems.

Literature Review

Methods eligibility criteria

The criteria in selecting articles must include literature reviews and publications via PubMed, Scopus, Web of Science, and CINAHL. These publications must contain information about the present status of telepharmacy-assisted pharmaceutical services and its future perspectives, specifically from international and local studies. Moreover, it must include perspectives of pharmacists on both clinical benefits and challenges especially during the COVID-19 pandemic. Lastly, reviews about telepharmacy implementation from 2019 to present shall be included. On the other hand, it excludes publications past 2019, and publications that are solely focused on telehealth that does not contain pharmacy-specific involvement.

Search strategy

A thorough search approach will retrieve relevant studies from various electronic databases and grey literature sources. Google Scholar, PubMed, Scopus, Web of Science, and CINAHL are among the databases that will be searched. Medical Subject Headings (MeSH) terms and keywords will be combined in the search to locate related to telepharmacy and medication access. The primary search terms include: “telepharmacy,” “remote pharmacy,” “virtual pharmacy,” “medication access,” “pharmacy services,” “telehealth,” and “patient care.” Boolean operators (AND/OR) will be used to combine terms, and truncations such as telepharm will account for variations of key terms. An example search string for PubMed is: (“Telepharmacy” OR “Remote Pharmacy” OR “Virtual Pharmacy”) AND (“Medication Access” OR “Medication Management” OR “Pharmacy Services”) AND (“Patient Care” OR “Pharmacy Care”).

The search will be limited to English-language publications published between 2010 and 2024 utilizing filters. The grey literature will also be explored to include relevant reports, theses, and conference proceedings using Google Scholar and ProQuest Dissertations and Theses. To ensure a comprehensive search, the reference lists of all included studies will be manually screened for additional articles. The databases searched, the search terms used, and the filters applied will all be thoroughly documented.

Data extraction

The study selection process will be reported using the PRISMA flowchart. It will follow a structured and transparent approach to ensure consistency. All records retrieved from the database searches will be imported into citation management software (e.g., EndNote or Zotero), where duplicates will be removed. Two reviewers will independently check the remaining papers' titles and abstracts with the inclusion and exclusion criteria. A full-text review will be applied to studies that satisfy the eligibility requirements. A third reviewer will be consulted or discussed to settle any disputes among the reviewers (Figure 1).

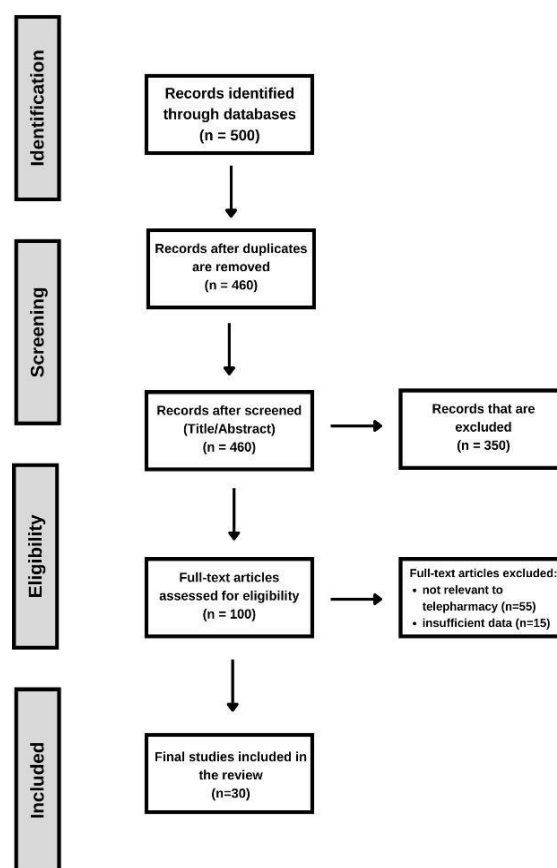


Figure 1. Flow diagram of the search and study selection process.

A total of 500 studies were initially identified through comprehensive searches across multiple scientific databases using keywords and MeSH terms related to telepharmacy, medication access, and care delivery. After removing duplicates, 460 unique studies were screened for relevance based on their titles and abstracts. This initial screening phase excluded 350 studies that did not meet the inclusion criteria, such as those unrelated to telepharmacy or lacking focus on medication access and care.

The remaining 100 full-text articles were assessed for eligibility using predefined criteria to ensure the studies provided relevant outcomes and reliable data. At this stage, 55 studies were excluded for not being directly relevant to telepharmacy services but focused more on telecommunication in the medical field as a whole, while 15 studies were excluded due to insufficient or incomplete data. Eventually, 30 studies were included in the final analysis, ensuring insightful information about how telepharmacy improves patient care delivery and medication access and addresses healthcare disparities, particularly in remote or underserved areas.

A standardized data extraction form will systematically collect and organize relevant information from the included studies. The form will capture key variables, including study characteristics such as author(s), year of publication, country of origin, and journal of publication, as well as the study design (quantitative, qualitative, or mixed methods). Details of the telepharmacy intervention will be recorded, including the

type of intervention (e.g., virtual medication dispensing, remote counseling, teleconsultation), the technology used (e.g., video conferencing, e-prescription systems), and the setting (e.g., rural, urban, community pharmacy, or hospital). Information about the population will include patient characteristics, such as age, gender, and health conditions, along with healthcare providers involved in the intervention.

The form will also document outcomes, focusing on improvements in medication access, such as geographic reach and time to medication delivery, and patient care outcomes, including medication adherence, clinical results, patient satisfaction, and quality of care. Key findings will be extracted, summarizing each study's primary results and implications, as well as challenges and limitations, including barriers to implementation and areas for improvement.

Discussion

According to Ghazali, the implementation of telepharmacy technology has expanded significantly, specifically during the COVID-19 pandemic—ensuring pharmaceutical services. In this cross-sectional study, data were collected from 520 registered pharmacists under 35 years of age (23–34 years old) using an online questionnaire and analyzed using SPSS version 26.0. The study achieved an 86.7% response rate wherein 73.1% were female participants, and aged between 26 and 30 years old (53.8%). The knowledge assessment showed high awareness of telepharmacy's importance and its role during the COVID-19 pandemic, with 96.15% recognizing the need for a strong internet connection. In this case, 90.38% agreed that telepharmacy enhances medication access in rural areas.

On one hand, Ibrahim et al., gained results from their prospective study—revealing pharmacist recommendations related to COVID-19 at pharmacies with telepharmacy were significantly more likely to be:

- Contact the nearest testing center.
- Maintain home quarantine;
- Take paracetamol for fever

In this case, the rates of Medication Dispensing Errors (MDEs) and its subcategories, prescription-related errors, and pharmacist counseling errors across pharmacies with telepharmacy versus those without remote services were (15.81% vs. 19.43%, $p < 0.05$), (5.39% vs. 10.08%, $p < 0.05$), and (10.42% vs. 9.35%, $p > 0.05$), respectively. However, pharmacies with telepharmacy were more likely to include wrong patient errors (AOR=5.38, $P < 0.05$).

Furthermore, telepharmacy in critical care settings for patient-centered care and multidisciplinary collaboration were investigated [4]. In this scoping review, out of 77 reports retrieved, 14 were included as per inclusion criteria. Eight studies (57%) were published since 2020, and nine (64%) were from the United States. These reported a wide assortment of reactive/scheduled telepharmacy activities. The acceptance of telepharmacy interventions was about 75% in four studies and 51–55% in two studies.

It revealed the benefits of telepharmacy which includes resolved drug-related problems, increased compliance with guidelines, maintained interactions with other health care providers, and patient safety among others. On the other hand, challenges included communication, intervention, documentation, tracking implementation of recommendations, and monetary/financial and legislative/regulatory issues.

On one hand, as the perception and readiness of pharmacists towards telepharmacy was explored through a cross-sectional analysis [5], 84.5% out of 380 pharmacists from the different provinces of Pakistan perceived telepharmacy implementation as a practice that improves patient's quality of life and decreases patients' visits. In this case, 59.7% pharmacists had negative perception towards benefits of telepharmacy implementation, but in terms of the positive perception, 67.9% were positive regarding eligibility and 71.3% regarding regulatory issues.

Conclusion

Overall, the results of the aforementioned literature revealed high rates regarding the positive role of telepharmacy—especially their eligibility, maintained interactions with other health care providers, patient satisfaction and safety among others, and how it reduced the burden on the healthcare system especially during the COVID-19 pandemic. It is evident that the main scope of the publications acquired significant reliance from post-March 2020 when the pandemic and lockdown due to the coronavirus disease occurred. On the other hand, one of the noticeable gaps in the literature include the economic and legal dimensions of telepharmacy, the methods to sustain it, collaboration models, institutional characteristics, and the performance in critical care which remains under published—having a lack in evaluation regarding its comprehensive frameworks [6].

In exploring the role of telepharmacy in healthcare, the findings implied that the majority of pharmacists had a positive perception regarding the eligibility of patients and regulatory issues/legal framework regarding the implementation of telepharmacy—especially its use during the COVID-19 pandemic to present. Ghazali found that young pharmacists in rural Indonesia demonstrate a good level of knowledge and generally positive perceptions about telepharmacy, with notable readiness among pharmacists with less than five years of experience. On the other hand, there are existing findings that recognized knowledge gaps, specifically comprising lack of frameworks for implementation/evaluation of telepharmacy in critical care.

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