

Telepharmacy: Current Scenario and Future Perspective

Vitthal B. Gaikwad¹, Ashwini Thorat², Dr. Gajanan Sanap³

Late Bhagirathi Yashwantrao Pathrikar College of Pharmacy, Pathri

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Abstract:

Telepharmacy, a rapidly evolving field within healthcare, is the remote provision of pharmaceutical services using telecommunications and information technology. This review article provides an in-depth analysis of the current state of telepharmacy, examining its implementation, advantages, and challenges. It delves into the utilization of telepharmacy in rural and underserved areas, addressing medication management, prescription dispensing, and patient counseling. Furthermore, this review explores the regulatory framework and ethical considerations surrounding telepharmacy. In anticipation of future trends, it discusses emerging technologies such as telemedicine platforms, AI-assisted prescription verification, and the potential for enhancing patient care through telepharmacy. This comprehensive review aims to inform healthcare professionals, policymakers, and stakeholders about the present state and promising prospects of telepharmacy in delivering efficient, accessible, and quality pharmaceutical services.

Background: Telepharmacy is a in short online pharmacy in which the pharmacist provides pharmaceutical care or services to patient by using telecommunication technology. It involves pharmacist and pharmacy technicals who provides remote access to patient or customers by reviewing and verifying medication orders, counselling patient, and monitoring their drug therapy by using audio, video, and other communication channels. It may include a collaboration with a healthcare services providers or hospitals. The aim of a telepharmacy is to enhance a medication management, improve patient access to prescription and ensure medication safety.

Aim: This paper has reviewed the multi-faceted nature of telepharmacy, recapitulating different aspects in the area. Advantages and limitations of telepharmacy are bandied as well. The end of this review composition is to offer a comprehensive

disquisition of the current state of telepharmacy, with a specific focus on its perpetration, benefits, and challenges. As telepharmacy continues to gain instigation, it's imperative to assess its present geography, including the systems and technologies used, its non-supervisory frame, and the ethical considerations that govern this remote practice.

Conclusions: currently, the deficit of health labor force, and in particular druggists, is a grueling issue that the health systems have to face. The use of a new technology similar as telepharmacy can represent a possible option to break these problems. still, there are unsolved limitations (e.g., legal counteraccusations) that make lesser proximity of telepharmacy delicate.

Keywords: Telepharmacy ; community pharmacy ; clinical pharmacy ; online pharmacy ; internate pharmacy ; telemedicine ; videotelemedicines

I. Introduction :

Telepharmacy, a groundbreaking conception at the crossroad of healthcare and technology, has been steadily reshaping the way pharmaceutical services are delivered. In an period characterized by rapid-fire advancements in telecommunications and information technology, the integration of these tools into the field of drugstore has given rise to telepharmacy — a system of furnishing medicinal services ever. This innovative approach to healthcare holds the implicit to revise drug operation, tradition allocating, and patient comforting, making healthcare services more accessible and effective, particularly in underserved and pastoral areas. (2) Apothecaries are important structures of the health systems and can offer health services in a capillary way due to their wide proximity at least in industrialized countries. good health professionals similar as druggists, besides allocating medicinal products, can give advice to cases on medicine supposition rules and can also offer pharmacovigilance services (1).

Telepharmacy has emerged as a viable solution to address critical issues such as medication access, adherence, and management. It is not only a response to the ongoing changes in healthcare but also a proactive approach to bridge the gaps that often exist in patient care, especially for those residing in remote or medically underserved areas. This article also delves into the ways in which telepharmacy has been leveraged to enhance patient outcomes, as well as the challenges it faces in terms of regulation and acceptance in traditional healthcare systems.

Moreover, the future of telepharmacy is an exciting frontier to explore. Emerging technologies, such as telemedicine platforms and AI-assisted prescription verification, hold great promise in further improving the delivery of pharmaceutical services. By analyzing the current landscape and contemplating future trends, this review aims to provide healthcare professionals, policymakers, and stakeholders with a comprehensive understanding of the evolving field of telepharmacy and its potential to redefine the way pharmaceutical services are provided.

Operation of the information and communication technologies (ICTs) to the health sector can open new perspectives in the delivery of health services and can contribute to limit the problem of dropped vacancy of health professionals. One occasion can be represented by telepharmacy services. Telepharmacy is defined as “the provision of druggist care by registered druggists and apothecaries through the use of telecommunications to cases located at a distance” (3)

II. Material And Methods

The crucial words used when searching included “telemedicine”, “telehealth”, “pharmaceutical care services”, “drug review”, “adherence comforting”, “community drugstore”, “itinerant setting”, and online drugstore, and a combination of these crucial words. The rejection criteria were if the publication was previous to September 2023, if the studies weren't published in English, didn't have references to pharmaceutical care or didn't have applicability to telepharmacy. The hunt was conducted via PubMed, ChatGpt and Google hunt. authors have also chased terms similar as “telehealth”, “telecare”, “health care telematics”, and “cyber-care.” generally, these are broad terms encompassing all the health professions, health services, and technologies for the provision of all health care-related services. Telemedicine handed by videotape is the technology that

dominates the telemedicine literature, nonsupervisory documents, and demographic checks

Background and Definitions

The term “telemedicine” was introduced in the 1960s. Telemedicine also described croaker furnishing case care using interactive or store-and-further videotape.(4) 7 The description has ago been broadened to include all types of telecommunication and informatics technology used to deliver health care and circulate educational information to cases and populations. In an attempt to distinguish the provision of health care over a distance from the practice of drug The title of telemedicine is generally inconsistent and confusing. The Institute of Medicine defined telemedicine as “the use of electronic information and dispatches technologies to give and support health care when distance separates the actors.”(5) immaculately, every composition or discussion about telemedicine should include a description of the term. Telemedicine isn't just about telecommunications and electronic information technology. The following citation summarizes the compass of the bid “Telemedicine reflects the confluence of technological advances in a number of fields, including telecommunications, space wisdom(e.g., satellites), accoutrements wisdom, computer and software engineering, artificial intelligence, perceptual psychology, robotics, and drug.”(6)

Telemedicine

The term “tele” originated from the Greek word “Telos” Meaning “at a distance” and the term “medicine” derived From a Latin word “Meden” meaning “to heal”. This technology was devised to provide healthcare services to medically Deprived population in geographically remote locations with The help from long-distance medical centers.(7)

Telemedicine Has been defined by the World Health Organization as

“The delivery of healthcare services, where distance is a critical Factor, by all healthcare 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 healthcare providers, all in the interests of advancing The health of individuals and their communities.”(8) (Reprinted From World Health Organization. WHO Group Consultation On Health Telematics. A Health Telematics Policy in

Support Of WHO'S Health-For-All Strategy for Global Development: Report of the WHO Group Consultation on Health Telematics 11–16 December. Definition, concept and functions of health Telematics. Pg 10. Copyright [1998].(8)

Telemedicine involves a different range of technologies and operations. The most generally described telemedicine Practice is those involving the use of telephones, videoconference, and the Internet.(9) Telemedical programs and consultations are gaining fashionability each time since treatments via Telemedical programs feel to achieve analogous labors as Those attained through face-to-face care.(9)

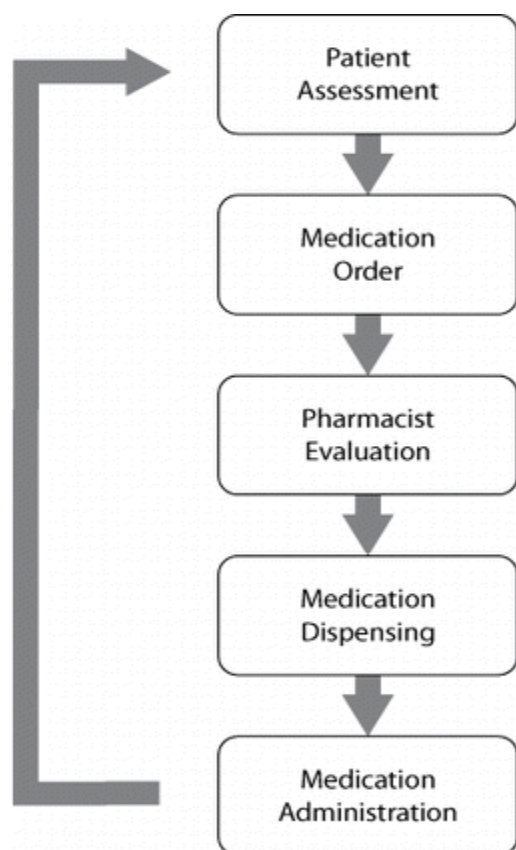


Fig.1 process of telemedicine

Telepharmacy

Telepharmacy, similar to telemedicine, is a more recent Concept that refers to pharmaceutical service provision. Strategies to address the walls to penetrating drugstore Services have redounded in the creation of several models Of telepharmacy. The National Association of Boards of drugstore defines “ telepharmacy ” as “ the provision of

Pharmaceutical care through the use of telecommunications And information technologies to cases at a distance ” (10) Telepharmacy delivers clinical drugstore services and the Dispensing of a tradition at a remote position without The physical presence of a druggist. Typical telepharmacy involves services similar as drug order review, Dispensing and compounding, medicine information services, Case comforting, and remedial medicine monitoring.(11) Hence, telepharmacy uses state- of- the- art technology that Allows a good druggist positioned at a central position To supervise a drugstore adjunct or a drugstore technician positioned at a remote point in the allocating of medicinals Through audio and videotape computer links.(12)

Telepharmacy acts as a implicit volition to around- the timepiece on- point druggist drug review for remote hospitals.(13) This has been espoused by numerous healthcare institutions As an indispensable strategy of extending drugstore content In areas where 24- hours drugstore services aren't available.(14) The arising electronic health information systems And affiliated technologies, similar as fax, and electronic health Records make information more readily available to druggist for review before a cure is available for administration To a case. These technologies are advancing telepharmacy Services and enabling druggist to contribute efficiently in perfecting drug use.(15)

In this article, telepharmacy has the same basic definition as telemedicine but refers to pharmaceutical service provision. Telepharmacy is not a new concept; every pharmacist has, for example, provided care by telephone. Yet it was only in 1997 that the National Association of Boards of Pharmacy (NABP) officially defined telepharmacy: “The provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distance.”[16] No state has adopted a “Telepharmacy Practice Act,” but a recently published NABP survey of telepharmacy in 30 states indicated that a third of those states were considering regulatory action in the near future.[17] The New York State Board of Pharmacy recently approved a regulation allowing prescriptions to be e-mailed over the Internet.[18]

How does telepharmacy work ?

In general, a small pastoral sanitarium, drugstore, or clinic in an Isolated area is connected to a generally employed service Model in larger

civic center that has lesser access(frequently 24 hours) to druggist staff. This connection is possible Through videophone systems, new software, and automated allocating machine.(19) The pastoral point Is generally staffed by either drugstore technicians or nursers, depending on whether the point is a drugstore or a clinic. They may communicate the Conventions(eg, fax) from cases who report to these spots To the central point, which is also reused by a good druggist Telepharmacy services generally fall within one or further of the following four orders

1. Case comforting. Case comforting is one of the most precious services that druggists can give via telepharmacy technology. Virtual case comforting enables cases to talk with their druggists more constantly and accessibly about questions they may have about their drug, which can eventually help ameliorate effects like drug adherence.

2. drug or complaint operation. drug or complaint operation may include remote medicine remedy monitoring, drug remedy operation, or habitual care operation, which can all be handed nearly via an intertwined druggist-patient platform.

3.drug review. drug review includes drug conciliation, which involves relating and developing the most accurate list of all specifics a case is taking. This generally occurs in the outpatient setting. drug review also includes new drug comforting, which may also do in the outpatient setting upon patient discharge. Although hospitals have in- house druggists, they frequently witness staffing and time constraints. Offsite telepharmacy support can palliate these challenges and help hospitals apply advanced- quality drug conciliation programs

4. Remote verification. Remote verification generally involves a druggist ever supervising a drugstore technician as she prepares conventions for

allocating. This enables apothecaries to operate with more effective staff structures, and for extended hours(e.g., after the druggist- in- charge on position leaves for the day). Automated Dispensing Machines. Automated allocating machines are digital medicine storehouse, allocating, and monitoring bias. Some healthcare settings, similar as hospitals and nursing homes, use automatic allocating machines to distribute specifics safely in the absence of a certified druggist.

The drugstore technician or nanny at the pastoral point also Scans the bar law so that the tradition matches with its Marker, attaches the marker, and supplies it to the case. The druggist at the central end can visually cover the technician or nanny 's work to insure that the right specifics Have been filled and allocated. At the end of the process, the Central druggist provides a two- way videotape discussion for The case to insure that they understand the intended drug use and administration.(20) This addresses any enterprises From the case's perspectives and enables effective patient Comforting from the central position. Automated allocating machines, still, aren't always Affordable for small pastoral hospitals or conventions. An indispensable Was developed by experimenters in Fargo, ND, USA, where A technician under the videoconference supervision of a Central druggist at a distant position prepares drug For allocating, repackaging, and relabeling. These specifics are also directly delivered to the nanny by the drugstore Technician or are allocated through automated allocating bias(when available). In another illustration, to grease 24- hour access to the druggist by physicians and nursers In the patient care area for face- to- face discussion and Communication, a wireless mobile technology wain has been Developed for use in remote hospitals.(20)

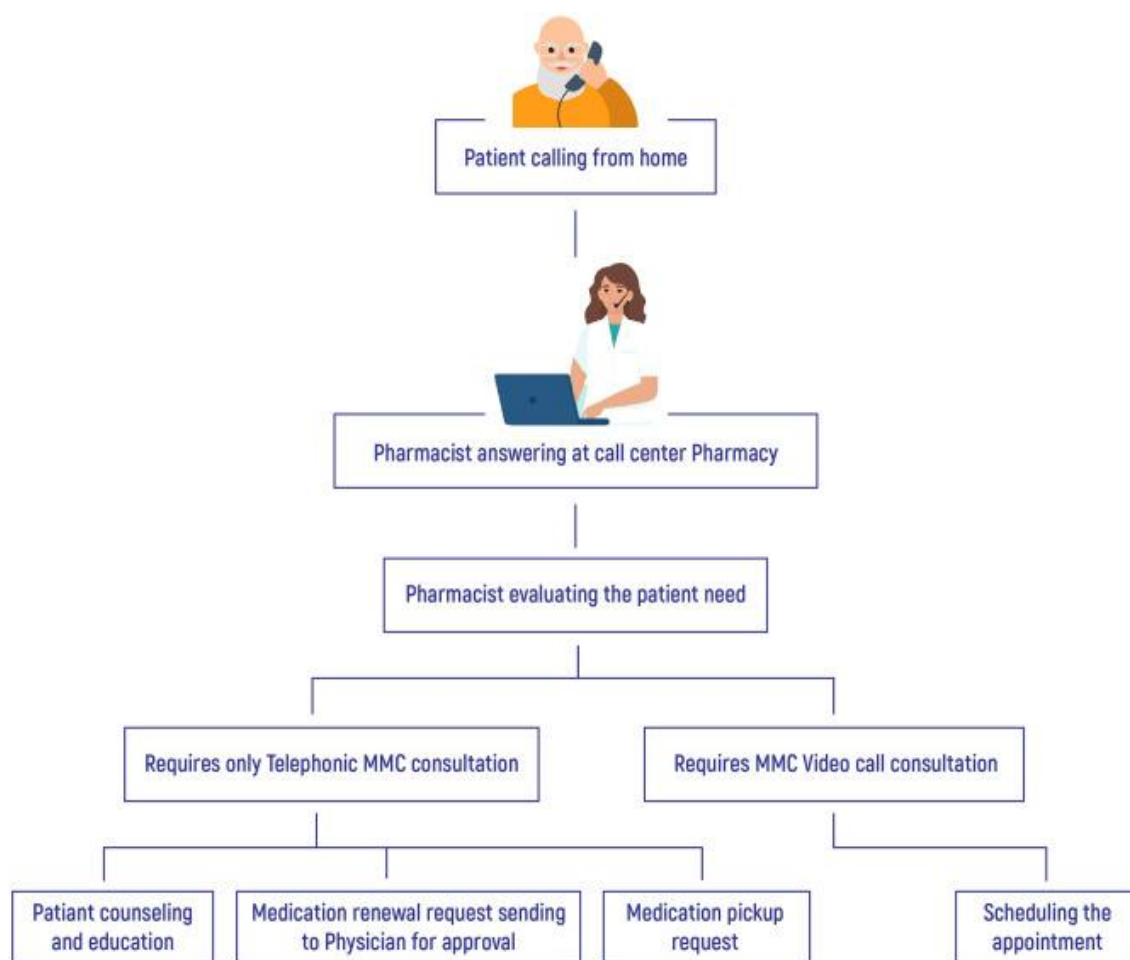


Fig. 2 working of the telepharmacy services

Current situation of telepharmacy

in September 2021, telepharmacy was a growing field with significant potential, driven by advancements in technology and the need for increased access to healthcare services. Telepharmacy involves the remote provision of pharmaceutical care and medication management services using telecommunications technology. It can take several forms, including video consultations, virtual medication reviews, and remote prescription dispensing.[2]

Here are some key points about the current situation of telepharmacy:

1. **Increased Adoption:** Telepharmacy has seen increased adoption, especially during the COVID-19 pandemic, as it allows patients to receive pharmacy services without in-person contact, reducing the risk of disease transmission.

2. **Medication Management:** Telepharmacy is being used for medication therapy management,

medication adherence monitoring, and providing consultations on prescription medications.

3. **Rural and Underserved Areas:** Telepharmacy is particularly valuable in rural and underserved areas, where access to traditional pharmacies can be limited. It helps bridge the gap and ensures patients have access to medication-related services.

4. **Regulatory Changes:** Regulations surrounding telepharmacy vary by location. Many jurisdictions have updated their regulations to accommodate telepharmacy, which includes rules for prescription verification, remote dispensing, and licensing requirements for pharmacists providing telepharmacy services.

5. **Patient Convenience:** Telepharmacy offers convenience to patients, making it easier to access prescription medications and consult with pharmacists from the comfort of their homes.

6. **Pharmacist Consultations:** Patients can have virtual consultations with pharmacists to

discuss medication management, potential drug interactions, and side effects. Pharmacists can also remotely verify and dispense prescriptions.

7. **Telehealth Integration:** Telepharmacy is often integrated with broader telehealth services, allowing patients to receive comprehensive healthcare consultations that include pharmacy services.

8. **E-Prescriptions:** Electronic prescriptions (e-prescriptions) have become more common, making it easier for patients to receive their medications through telepharmacy services.

9. **Medication Delivery:** Many telepharmacy services offer medication delivery options, ensuring that patients receive their medications in a timely and convenient manner.

10. **Remote Medication Monitoring:** Some telepharmacy platforms incorporate remote monitoring technology to track

Telepharmacy during covid pandemic

A coronavirus linked as SARS-CoV-2, was discovered in December 2019 in Wuhan, China. later, the contagion continued to spread and its contagious impact was seen across the world. To date, according to the World Health Organization(WHO), there have been over 203 million verified cases of Coronavirus Disease 2019(COVID- 19) and over 4 million deaths encyclopedically(21)

Pharmacies were no exception to COVID-19 s impact. they started acting quickly to ensure patient and pharmacy staff safety as soon as the epidemic was announced. The financial strains imposed by government-mandated lockdowns also affected pharmacies. Many had to reduce staffing, take less compensation for the services provided, or close stores [22,23]

As the highly transmissible and virulent virus expanded in the United States before the release of vaccine in 2020, healthcare facilities began to experience a surge in the patient population who tested positive for COVID-19 and became burdened by increased rates of hospitalization [24]. There was a great deal of worry and anxiety, particularly among people who needed to seek medical attention for non-COVID-19 issues. [25,26]. Patients avoided seeking hospital care due to stay-at-home orders or fear of the rising contagion [27]

Remote healthcare services during the pandemic have demonstrated benefits for the

healthcare system and improving public health [28]. Having access to telehealth services made it possible to isolate oneself more socially and limit one's risk of contracting an infection. Additionally, by lowering patient desire to visit facilities, the burden on healthcare facilities was lessened [28].

Apart from the financial obstacles, there were also practical issues related to safety protocols. Patients' capacity to physically visit pharmacies was restricted by mandatory social distancing; interactions between pharmacists and patients were further curtailed by staffing reductions and the shift of pharmacists to remote work [29].

Telepharmacy was quickly identified as a technology that could continue to provide high-quality patient care while overcoming many of the obstacles brought about by the pandemic. But historically, a lack of suitable legislation and reimbursement has made it impossible for many pharmacies to use telepharmacy [30, 31].

The advent of COVID-19 accelerated changes that would make telepharmacy a reasonable option[32] allowed pharmacies to utilize inexpensive teleconferencing platforms, such as Zoom or Skype, which would have otherwise been noncompliant with privacy standards. Furthermore, regardless of state regulations, emergency legislation permitted chemists to conduct COVID-19-related services such COVID-19 testing, immunisations, and telepharmacy [32, 33].

Though these changes made telepharmacy more accessible from legal and monetary perspectives they are not permanent, nor did they provide guidance for implementation

Future Steps:

Going forward, there are some steps that need to be taken to ensure that telepharmacy will remain a meaningful service. to maintain and expand access to telepharmacy, chemists and pharmacy groups must push for additional long-term legislation. Particularly for community pharmacies, pharmacy organisations or pharmacy entrepreneurs may need to take action to create strong platforms that pharmacies and patients can use to engage with one another. The EMR system designed for healthcare systems may resemble this. To ensure its continued use, telepharmacy education is crucial for patients as well as chemists. Pharmacists can keep up with the latest telepharmacy practises with the use of formal continuing education programmes. To better understand how telepharmacy consultations are

reimbursed, further research is required, particularly when it comes to managing chronic illnesses. Similarly, the effects of telepharmacy on workload, patient outcomes, and safety future research should look into these and other pertinent issues, such as the use of social media for telepharmacy, public perception and access to technology, and pharmacy staff morale and attrition.[34]

Opportunities and actions

Telepharmacy presents pharmacy and individual pharmacists with great opportunities to become an even more integral part of the medication-use system.

Listed below are opportunities and suggested actions for pharmacy individual

Opportunity 1. Pharmacy can revisit the pharmaceutical care concept in light of the societal implications of the information superhighway and the globalization of health care.

Actions for pharmacy:

1. Hold a cyber-civilization and health care consensus conference hosted by information and telecommunications technology corporations, which would act as neutral parties in the health care turf wars. Attendees could include health care providers, consumers, the telemedicine industry, government agencies, legislators, and regulators.
2. Review pharmacy's mission statement, vision statement, and code of ethics and the definition of pharmaceutical care for possible modification.
3. Raise the pharmacy profession's awareness of telepharmacy.
4. Join in the planning and implementation of the NII and the GII [35]

Opportunity 2. Pharmacy can develop a set of telepharmacy principles and a telepharmacy practice model and process.

Actions for pharmacy:

1. Convene a consensus conference to develop a telepharmacy practice model.
2. Solicit for publication and meeting presentation current telepharmacy practice models and those telemedicine practices with telepharmacy implications.
3. Expand the working relationships with new disciplines that are needed to develop telepharmacy. [36]

Opportunity 3.

Pharmacy can ensure that practice standards and treatment guidelines reflect telepharmacy practice.

Actions for pharmacy:

1. Review all current professional standards, policies, position statements, and therapeutic guidelines for possible revision.
2. Evaluate and comment on other organizations' telemedicine standards and guidelines.
3. Work with pharmacy call center personnel to develop telephone pharmacy practice standards.

Opportunity 4.

Pharmacy can ensure that telepharmacy requirements are made part of the strategic planning, at all levels of decision-making, for telemedicine.[37]

Actions for pharmacy:

1. Develop a minimum required inventory of telepharmacy technology and techniques.
2. Facilitate the inclusion of telepharmacy needs in the telemedicine decision-making process.

Opportunity 5.

Pharmacy can broaden governmental education and fact-finding efforts, because any telecommunications or information technology regulation, law, or funding proposal may have implications for telepharmacy.

Actions for pharmacy:

1. Review federal and state telepharmacy-related activities.
2. Develop a system of monitoring ongoing federal and state telemedicine and telepharmacy activities.
3. Assess the need for new coalitions between the information technology industry and telemedicine providers that will better influence telemedicine policy.
4. Seek participation in federal and state telemedicine related advisory groups.[37]

III. Conclusion

Telemedicine presents profound opportunities and challenges to pharmacy and the other health care professions. The adoption of telepharmacy can represent a solution to the problem of pharmacist shortage and can contribute to guarantee a proper pharmaceutical assistance in underserved areas. The diffusion and adoption of telepharmacy represent a challenge involving different actors; the cooperation between public and private sectors as well as scientific institutions and academia is of paramount importance to obtain relevant results and an effective improvement in healthcare.

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