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Review Article

TELEPHARMACY SERVICES IN CONTEMPORARY HEALTHCARE: A REVIEW

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Telepharmacy, a specialized component of telemedicine, delivers pharmaceutical care through telecommunication media to patients who lack direct access to medical practitioners, with particular relevance for remote and rural settings where technology-enabled medication delivery is increasingly critical. This work aims to comprehensively outline telepharmacy organizations and services, describe its end-to-end operational workflow, classify major telepharmacy models, summarize key applications and examples, and situate opportunities and barriers within the Indian telehealth context. Using a structured descriptive approach, the telepharmacy process is delineated from prescription initiation and digitization (e-prescription or high-resolution scanning at remote sites) through pharmacist review using Electronic Health Records to assess dosing accuracy, interactions, allergies, and medication history, followed by technician-led or automated dispensing, remote visual verification via high-definition cameras to ensure accuracy, real-time patient counselling by video/audio covering administration, side effects, storage, and questions, and documentation with potential AI-enabled follow-up and adherence monitoring via wearables or smart devices. Telepharmacy modalities include inpatient remote order-entry review to extend 24/7 hospital coverage, remote dispensing for retail/outpatient/discharge services, IV admixture verification using image-based aseptic workflows, and remote patient counselling for general and specialist care (e.g., diabetes, HIV/AIDS). Reported advantages include improved access, support for social distancing and no-contact care, enhanced patient satisfaction and counselling efficiency, and mitigation of local pharmacist shortages; limitations include heterogeneous regulations and licensure requirements, potential mandates for on-site visits, clinical unsuitability in some cases, communication gaps, affordability constraints, literacy and language barriers, and unresolved legal implications. In India, where rural populations constitute 68% and healthcare resources are often insufficient, telemedicine is broadly accepted but requires government support, training programs, and attention to privacy and patient–clinician rapport. Overall, telepharmacy can replicate core pharmacy functions across distances and strengthen continuity of medication care, but scalable implementation depends on regulatory clarity, infrastructure investment, and user-centered communication strategies.

Keywords: Pharmaceutical care, Telecommunication, Remote, Telemedicine, Electronic Health Records, Automated dispensing.

INTRODUCTION

Telepharmacy is the provision of pharmaceutical care via telecommunication media to patients who may not have direct contact with a medical practitioner. It is a component of telemedicine, practised within the specialised field of pharmacy.

Telepharmacy organisations include

1. Medication therapy monitoring
2. Patient coordination
3. Prior authorization
4. Refill authorisation for physician-prescribed medications (1,2)

Monitoring of protocol compliance is conducted through teleconferencing or videoconferencing.

The use of telecommunication technologies has increased substantially, and medication delivery via telepharmacy is critical, particularly in rural areas.

In this model, the pharmacist prepares/audits and records reports and investigation cases through telephone conversations, email, and helpline

portals.(3,4)

Advantages

- Provides essential access to clinical care services in remote and rural areas.
- Facilitates social distancing and no-contact care by enabling verbal communication through telehealth platforms.
- Enhances patient satisfaction by improving access to medications and information within their local community.
- Supports efficient patient counseling.
- Reduces the impact of limited availability of locally based medication experts and pharmacy services.(5-7)

Disadvantages

- Regulations and laws governing telepharmacy vary by state.
- May require additional licensure to provide telepharmacy services.
- Some state laws and regulations may still require on-site visits to the telepharmacy or remote location.
- Patient's clinical status may be unsuitable for telepharmacy in certain situations.
- Risk of communication gaps between patients and providers.(8,9)

The process of telepharmacy

The process of telepharmacy is a structured workflow that uses digital infrastructure to replicate the traditional pharmacy experience while removing geographical barriers. It connects a central pharmacy (where the pharmacist is located) with a remote site (where the patient or technician is located). (10)

Here is a step-by-step breakdown of how the process typically functions:

1. **Prescription Initiation and Digitization**

The process begins when a healthcare provider issues a prescription. In a telepharmacy setup, this is usually an e-prescription sent directly to the pharmacy software. If the patient has a physical paper prescription at a remote location, it is scanned into a high-resolution imaging system by a certified pharmacy technician or via an automated kiosk.

2. **Pharmacist Review and Verification**

A licensed pharmacist at the central "hub" receives the digital prescription and the patient's Electronic Health Records (EHR). The pharmacist performs a clinical review, checking for:

- Correct dosage and instructions.
- Potential drug–drug interactions.
- Allergy contraindications.
- Patient medication history.

3. **Preparation and Dispensing**

Once the pharmacist approves the order, the medication is prepared at the remote site in one of two ways:

- Technician-led: A pharmacy technician at the remote location selects the medication and prepares the label.
- Automated dispensing: An automated machine (similar to a specialized vending machine) selects the correct medication and bottles it.

4. **Remote Visual Verification (the "Digital Check")**

Before the medication is handed to the patient, the pharmacist must verify the work. The remote site uses high-definition cameras to show the pharmacist

the stock bottle, the filled container, and the final label. The pharmacist compares these images with the original prescription to ensure 100% accuracy.

5. Patient Counselling (Tele-consultation)

This is the most critical step for clinical care. Before the patient leaves with their medication, they participate in a private, real-time video or audio consultation with the pharmacist. During this session, the pharmacist explains:

- How to take the medication.
- Potential side effects.
- Storage requirements.
- Answers any questions the patient may have.

6. Documentation and Follow-Up

The entire interaction is documented in the patient's EHR. In modern systems, AI tools may also be used to schedule follow-up reminders or monitor adherence data sent from the patient's wearable devices or smart pill bottles. (11-15)

Types Of Telepharmacy

I. Inpatient (Remote Order-Entry Review)

Definition

In this model, the pharmacist collaborates with the physician from a remote location to provide order-entry review for a hospital's inpatient pharmacy. Before medications are dispensed to patients by hospital staff, the remote pharmacist verifies the prescription orders.

Uses

This model enables real-time evaluation and verification of medication orders. It allows pharmacists to supplement and strengthen inpatient pharmacy services by providing 24/7 coverage or additional support during peak workload periods.

II. Remote Dispensing (Retail/Outpatient/Discharge)

Telepharmacy, most commonly used in retail and outpatient department (OPD) pharmacies, provides patients with timely access to medications regardless of their geographic location.

By extending the services of a pharmacist across multiple sites, healthcare organizations can establish retail telepharmacies in areas where a traditional pharmacy would not be feasible. This approach can reduce costs by improving medication adherence, enhance financial performance, and improve patients' experience while expanding the organization's geographic reach.

III. IV Admixture

Definition

According to the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), IV admixture is "the preparation of a pharmaceutical product that requires the measured addition of a medication to 50 mL containers of IV fluid."

Uses

IV admixture telepharmacy is designed to save time and costs for hospital pharmacies. Pharmacists can remotely verify IV admixtures without needing to enter aseptic rooms, thereby saving preparation time.

When pharmacists' time is freed, they can focus on therapeutic decision-making and other revenue-generating activities. Implementing an image-based telepharmacy workflow in aseptic areas also provides the added benefit of allowing closer attention to each step of the process, thereby reducing errors.

IV. Counseling of Remote Patients

Definition

In this model, pharmacists and practitioners provide patient counselling through telecommunications technology to individuals located in remote areas.

Uses

Practitioners and pharmacists can communicate with patients and deliver a wide range of services through live remote consultations. Remote counselling supports specialist services (e.g., diabetes, HIV/AIDS), discharge counselling, and various clinical interactions with pharmacists. It benefits retail independent pharmacies, community pharmacies, clinics, and hospital pharmacies by extending access to professional counselling beyond traditional in-person visits.(16-18)

Applications of Telepharmacy

I. Community Pharmacy in a Retail Setting

Independent community pharmacies can use telepharmacy to extend their pharmacists' reach and capture more prescriptions. Due to technological advancements, pharmacy owners can now build retail telepharmacies onto their existing businesses to serve more customers and provide better access to pharmacy services.

Medication adherence and health outcomes can be improved by confirming pharmacy and a pharmacist in a convenient location.

II. Hospitals and Health Care Systems

Telepharmacy helps improve patient care.Remote order input review (inpatient) allows 24-hour (including overnight and extended) pharmacy coverage at rural hospitals and clinics, while retail telepharmacy may be used in-house or as an outpatient pharmacy extension to clinics throughout the region.

TeleCounsel TM, a live and interactive video counselling service, enables health systems to connect with specialists throughout the network, allowing them to collaborate in real time.

III. Pharmacies Caring for Specialised Patients

According to the NCPA, this is the fastest growing portion of the pharmacy industry. Telepharmacy may be employed by healthcare organisations to support patients in oncology, HIV, and hepatitis clinics. A convenient on-site telepharmacy is an alternative option available to specialised patients.

Using telepharmacy, a residency-trained HIV pharmacist can consult patients at clinics across the network via live video counselling. Patients can be assured that their medicines prescribed after clearance from hospital will be started right away, and specialists can educate them on the importance of staying on track.

IV. Mental Health Centers

With the increased focus on mental health around the world, pharmacists are well positioned to help patients with mental illnesses.

Integrating a pharmacist into the mental health care team enhances understanding of patients' conditions and reinforces the importance of taking medications exactly as prescribed. Telepharmacy supports adherence-friendly, point-of-care dispensing, and this close patient–pharmacist relationship is associated with improved treatment outcomes.

Mental health organizations can also use remote video therapy to connect specialists with clinics across their networks. This connectivity enables more efficient use of expert resources, leading to

better patient outcomes and improved quality of life.

V. Senior Living Centres

Telepharmacy with on-site dispensing can also support independent living centres. Having a low-cost telepharmacy on site allows seniors to obtain emergency medication quickly. With one or more qualified pharmacy technicians on staff and a remote pharmacist overseeing operations, this type of remote dispensing site functions similarly to a standard retail telepharmacy. Patients in long-term care may also appreciate remote video technology, which enables them to have counselling sessions with pharmacists at their bedside using tablets.

VI. Doctor's Offices

A pharmacist can also be virtually present in a physician's office to address patient issues and adherence through telepharmacy. This arrangement is beneficial for all parties. Physicians are evaluated on their patients' adherence, and it is challenging to ensure adherence when prescriptions are filled elsewhere.

A physician and an independent retail pharmacy owner can collaborate to open a licensed telepharmacy site within the doctor's office. The telepharmacy owner must store medication, obtain licences, and secure reimbursements in the same way as a conventional pharmacy.

Patients benefit from this application of telepharmacy because they have convenient access to a pharmacist and point-of-care dispensing.

VII. Language Barriers in Healthcare Organisations

Members of the public may find it difficult to obtain the care and prescription medications they need to live a healthy life because of language barriers. In an increasingly diverse society, telepharmacy software can help connect patients with healthcare professionals who understand their concerns and how to address them. Language barriers in healthcare are more common in cities than in rural areas; however, they create similar challenges in accessing care.

Patients who communicate only using ASL (American Sign Language) face additional barriers to care, as ASL-fluent pharmacists are few and far between. These patients can also access pharmaceutical care through interactive video counselling sessions.

SGPGIMS, Lucknow, is currently operating a telemedicine department, which may also support the development of telepharmacy.

VIII. Employer Campuses and Schools

Employer-based pharmacies are a relatively new telepharmacy application, but they are becoming more common as many large companies employ thousands of individuals on a day-to-day basis.

Employer-based telepharmacies are not only cost-effective, but they also help employees stay healthy, reduce sick days, and save money for both patients and the company.

Students, teachers, professors, and other staff members may obtain prescription medications from the campus-based remote dispensing facility.(19-22)

Examples of Telepharmacy

I. Remote Counseling:

Pharmacists provide patient counseling via live, interactive video sessions. They can discuss medication instructions, side effects, chronic illness

monitoring (such as diabetes or HIV), and lifestyle recommendations.

II. Inpatient Remote Order-Entry Review:

A remotely located pharmacist reviews medication orders for an inpatient hospital pharmacy before hospital staff administer the drugs to the patient. This allows hospitals to maintain 24/7 coverage and real-time verification without needing a pharmacist on-site at all times.

III. Remote Dispensing (Retail/Outpatient):

A retail community telepharmacy is staffed by certified pharmacy technicians, while a remote pharmacist supervises them and reviews prescriptions via a live video feed or images. Automated dispensing machines can also be used, where a pharmacist authorizes the machine to dispense the medication after reviewing the prescription and consulting with the patient by phone or video.

IV. Rural Pharmacy Support:

In rural areas that cannot support a full-time pharmacist, telepharmacy connects patients and local pharmacy technicians or nurses to a central pharmacist. This ensures that patients in isolated locations still receive expert pharmaceutical care and access to medications.

V. Admixture Review:

In hospital pharmacies, remote pharmacists can review the preparation of intravenous (IV) solutions using image-based workflow systems. This saves the time needed to suit up and enter the cleanroom, allowing them to focus on clinical activities.(23-25)

The current status of telemedicine in India is as follows:

- The healthcare infrastructure is inadequately developed and fails to meet patient expectations, particularly in terms of the availability of resources, physicians, staff, and equipment.
- Rural areas account for 68% of the population in India, whereas urban areas with secondary and tertiary care services account for 32%.
- Telemedicine enables physicians and other healthcare practitioners, including specialists who cannot be physically based in rural locations, to provide services remotely.(26-28)

Telemedicine Challenges and Opportunities in India

1. This system is accepted by the general public, patients, family doctors, administrators and, most importantly, the government. Patients may feel a lack of emotional connection with clinicians and specialists, while new or inexperienced physicians may find it difficult to persuade patients about their problems and may fear that their information could be compromised.
2. The Affordability Problem: For individuals with limited financial resources, the cost of adopting technology is excessively high, and establishing a telepharmacy is prohibitively expensive for many companies and institutions.
3. The number of lettered people and the languages they speak is limited; only 65

percent of the Indian population is educated, implying that many people in India are illiterate. For the uninitiated (without special knowledge), this communication mechanism can be difficult to understand.

4. Government support: As telemedicine is still in its early stages in India, it requires financial support and implementation from the government, which has the opportunity to improve the country's health-care system.
5. For the use of telemedicine, there should be ongoing medical education and training programmes for professionals, patients and other users.(29-33)

Telepharmacy's Operation

A patient presents their prescription to a licensed pharmacy technician, who reviews it and advises them on how to take their medication. The pharmacist also provides guidance to the patient on the correct use of the prescribed medicines.

In other circumstances, the technician receives the complete prescription via video or audio conference, including information on dose, dosing regimen, route of administration, fed/fasted state, interactions, and contraindications. The current shortage of healthcare staff, particularly pharmacists, is a major challenge. The use of modern technologies, such as telepharmacy, may offer a viable solution to these problems. However, unresolved issues, such as legal implications, continue to hinder the widespread adoption of telepharmacy. (34-36)

Conclusion

This review article provides a comprehensive overview of telepharmacy, a branch of telemedicine that delivers pharmaceutical care remotely using telecommunication technologies. It outlines telepharmacy's key functions, including medication therapy monitoring, patient coordination, and refill authorizations, emphasizing its critical role in enhancing healthcare access, especially in rural and underserved areas.

The article details the telepharmacy workflow, from prescription digitization and pharmacist review to remote dispensing, visual verification, patient counseling via teleconsultation, and documentation with potential AI support for follow-up. It categorizes telepharmacy into four types: inpatient remote order-entry review, remote dispensing (retail/outpatient), IV admixture verification, and remote patient counseling, highlighting their specific uses and benefits.

Applications span community pharmacies, hospitals, specialized patient care (e.g., oncology, HIV), mental health centers, senior living facilities, doctors' offices, and settings addressing language barriers, employer campuses, and schools. Examples illustrate telepharmacy's implementation in remote counseling, inpatient review, retail dispensing, rural support, and admixture review.

The article also addresses the current status and challenges of telemedicine and telepharmacy in India, noting infrastructural limitations, regulatory and legal barriers, affordability issues, literacy and language challenges, and the need for government support and ongoing education. It concludes that telepharmacy offers a promising solution to healthcare staff shortages and geographic barriers

but requires resolution of legal and operational hurdles for broader adoption.

REFERENCE

1. B Shah B. New Approaches to Pharmacy Practice: Telepharmacy. IJSR. 2021 Dec 5;10(12):1493–1496.
2. Poudel A, Nissen LM. Telepharmacy: a pharmacist's perspective on the clinical benefits and challenges. IPRP. 2016 Oct 1;5(1):75–82.
3. Baldoni S, Amenta F, Ricci G. Telepharmacy Services: Present Status and Future Perspectives: A Review. Medicina. 2019 July 1;55(7):327.
4. Le T, Toscani M, Colaizzi J. Telepharmacy: A New Paradigm for Our Profession. Journal of Pharmacy Practice. 2018 July 30;33(2):176–182.
5. Erfanifa A, Ghazizadeh Hashemi SAH, Abbasi Z, Mosleh H, Zand S, Atarod MM, et al. Advantages and Disadvantages of Telemedicine in Medicine: A Review Study. jzms. 2025 Jan 31;
6. Syamjith P, Sharma S, Sharma A, Sharma A, Mansoor M. Telehealth for Rural and Underserved Communities. In Bentham Science; 2025: p. 13–137.
7. Das DJ, Kutum DT, Deori DR, Deori DC. Telehealth Technology And Healthcare. In Iterative Selfypage Developers Pvt; 2024. p. 193–207.
8. Steckler T. Telepharmacy. Journal of Pharmacy Technology. 2016 Sept 23;32(6):227–229.
9. Tzanetakos G, Ullrich F, Meuller K. TELEPHARMACY RULES AND STATUTES: A 50-STATE SURVEY. Am J Med Res. 2018 Jan 1;5(2):7.
10. Kimber MB, Peterson GM. Telepharmacy—Enabling Technology to Provide Quality Pharmacy Services in Rural and Remote Communities. Pharmacy Practice and Res. 2006; 1;36(2):128–133.
11. Adams AJ, Martin SJ, Stolpe SF. "Tech-check-tech": A review of the evidence on its safety and benefits. American Journal of Health-System Pharmacy. 2011 Oct 1;68(19):1824–1833.
12. Patel SB, Narkhede KB, Prajapati A, Narkhede SB, Luhar S. Impact of Digital Health Technologies on Medication Adherence. AJPS. 2025, 22;141–146.
13. Almathami HKY, Win KT, Vlahu-Gjorgievska E. Barriers and Facilitators That Influence Telemedicine-Based, Real-Time, Online Consultation at Patients' Homes: Systematic Literature Review. J Med Internet Res. 2020 Feb 20;22(2):e16407.
14. Eggerth A, Hayn D, Schreier G. Medication management needs information and communications technology-based approaches, including telehealth and artificial intelligence. Brit J Clinical Pharma. 2019 25;86(10):2000–2007.
15. Keith MR. Televideo technology for patient counseling and education. American journal of health-system pharmacy : AJHP : official journal of the American Society of Health-System Pharmacists. 1999 May 1;56(9):860–861.
16. Wakefield DS, Ward MM, Loes JL, O'Brien J, Sperry L. Implementation of a telepharmacy service to provide round-the-clock medication order review by pharmacists. American Journal of Health-System Pharmacy. 2010 Dec 1;67(23):2052–2057.
17. Price M. Remote management of medication orders. American Journal of Health-System Pharmacy. 2009 Apr 1;66(7):612.
18. M DM, Babu DC. Telepharmacy Resolution: Embracing The Digital Frontier In Pharmacy Services. In Iterative International Publishers Selfypage Developers Pvt Ltd; 2024. p. 105–113.
19. Mccarthy C, Bateman MT, Henderson T, Jean R,

Evans R. Adoption of telepharmacy within a community health center: A focus on clinical pharmacy services. J Am Coll Clin Pharm. 2021 July 8;4(8):924–933.

20. Shapovalova V. Telemedicine and Telepharmacy in Modern Healthcare: Innovations, Medical Technologies, Digital Transformation. SSPMPM. 2025,1;5(3):1.

21. Mahendra KR, Sharma B, Singh G, Kumar A, Khera K. Telepharmacy and Remote Patient Monitoring. In Bentham Science; 2025. p. 117–132.

22. Shrivastava SR, Bobhate PS, Wibawa A. Facilitating Access to Pharmaceutical Care in Rural and Remote Communities by Strengthening Telepharmacy. The Nigerian postgraduate medical journal. 2025 Jan 1;32(1):68–70.

23. Schneider PJ. Evaluating the impact of telepharmacy. American Journal of Health-System Pharmacy. 2013 Dec 1;70(23):2130–2135.

24. Examining the implications of analytical and remote monitoring in pharmacy practice. Pharmaceutical Journal. 2017 Jan 1;

25. Examining the implications of analytical and remote monitoring in pharmacy practice. Clinical Pharmacist. 2017 Jan 1;

26. Shah A. Telemedicine in India: A perspective, collaboration, and knowledge sharing. Natl J Physiol Pharm Pharmacol. 2023 Jan 1;(0):1.

27. Ashokan A. Telemedicine: Bridging the Gap in Providing Primary Care to Rural Area Patients Across India. THMT. 2024 Oct 31;9(5).

28. Mathur P, Srivastava S, Lalchandani A, Mehta JL. Evolving Role of Telemedicine in Health Care Delivery in India. Primary Health Care. 2017 Jan 1;07(01).

29. Raj K, Bhatia DSP. Current Trends in Telemedicine in India. IJSREM. 2025 Jan 10;09(01):1–9.

30. Gokula RRM. Chapter 19: Telemedicine in India and Its Impact on Public Health. In Springer; 2020. p. 303–316.

31. Mishra SK, Gupta SD, Kaur J. Telemedicine in India: Initiatives and vision. In Institute Of Electrical Electronics Engineers; 2007. p. 81–83.

32. Chandwani RK, Dwivedi YK. Telemedicine in India: current state, challenges and opportunities. Transforming Government: People, Process and Policy. 2015 Oct 19;9(4):393–400.

33. Pandve HT, Gaikwad SR, Bhure BS, Kadam VM. Telemedicine: Transforming healthcare in India. BVMJ. 2022 Dec 31;2(4):34–40.

34. Citta W. The Effectiveness Of The Pharmacy's Role In Providing Drug Information On Telepharmacy. wiyata. 2024 June 26;11(1):90.

35. Jauza J, Thesa Ghozali M. Professional competence and Perception on the Practical Implementation of Telepharmacy among Pharmacists – A Review. RJPT. 2024, 25;2915–24.

36. Sabanovic S, Veladzic A, Ramic I, Mamatnazarova N. Review of Application of Telepharmacy Solutions in the Practice. In Institute Of Electrical Electronics Engineers; 2020. p. 1–6.