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A Review of Telepharmacy: Advancements, Challenges, and Future Directions

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Abstract

Like telemedicine, telepharmacy is a relatively new term that describes the delivery of pharmacological services. While tele comes from the Greek word "Telos," which means from a distance, medicine comes from the Latin word "Meden," which means to heal. The National Association of Boards of Pharmacy defines telepharmacy as the use of information and communication technology to provide patients with pharmaceutical treatment from a distance. Clinical pharmacy services are provided by telepharmacy. Telepharmacy is the practice of providing various patients with pharmaceutical supplies and care via telecommunication. The error rate in telepharmacies is less than 1%, which is half the national average and a 50% improvement over traditional treatment. A technique called telepharmacy makes it easier for individuals in rural and isolated locations to receive pharmaceutical care services. By enhancing medication management, recognizing, and resolving drug-related issues, monitoring, and optimizing medication, enhancing patient education, tracking adverse drug reactions, and addressing social determinants of health, it expands the responsibilities of pharmacists. Despite the pandemic's obstacles, telepharmacy has managed to continue offering outstanding pharmaceutical care. Electronic prescriptions, dispensing, and administering medications, supply chain automation, patient record preservation, and medication safety and efficacy monitoring are all made possible by technology. Certainly, telepharmacy is a fantastic concept, but implementing it can occasionally be difficult.

Keywords: Clinical pharmacy, digital health, online pharmacy, telehealth, telepharmacy

INTRODUCTION

Telepharmacy is defined by the National Association of Boards of Pharmacy as the use of information technology and telecommunications to provide pharmaceutical treatment to patients who are located remotely [1]. Digital health is a novel idea that emerged in recent years as a result of the fusion of digital technology and healthcare. Telepharmacy stands out among its many components as a revolutionary approach to healthcare delivery. Telepharmacy is revolutionizing how patients obtain medication and healthcare services by bridging geographical barriers and enhancing access to pharmaceutical care. We shall examine the idea of digital health and the substantial influence that telepharmacy has on contemporary healthcare in this blog post. We will go through its advantages, difficulties, and potential future developments, emphasizing how it has transformed patient care. Using technology to deliver pharmacological care to patients from a distance is known as telepharmacy [2]. In this manner, patients can get their medications and various pharmaceutical care supplies in the convenience of their own homes. Patient consultation, drug therapy monitoring, refill authorization for prescription medications, formulary compliance monitoring by video or teleconference, and prior authorization of

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prescribed medications are a few of the services provided. The phrase can also refer to the usage of videoconferencing in the pharmacy industry to aid pharmacists with professional training, education, and management support [3]. Automated medication packing and labeling devices that allow for the remote dispensing and distribution of pharmaceuticals are an example of telepharmacy practice. In addition to retail pharmacy settings, telepharmacy services can be provided in hospitals, assisted living centers, and other healthcare facilities [1–27]. Healthcare delivery in many nations has been significantly impacted by the 20th century's rapid development of communication and information technologies [26]. With increased Internet access, individuals are now more informed and have greater expectations of healthcare providers. Nevertheless, the availability of appropriate medical care is often constrained by shortages of healthcare resources and qualified professionals, particularly in rural and regional areas [5, 6]. A defining feature of telepharmacy services is the absence of a pharmacist's physical presence at the site of pharmacy operations or direct patient care. One of the primary advantages of telepharmacy is its ability to expand access to pharmaceutical services, including in underserved communities affected by geographic or economic barriers. However, telepharmacy also has several limitations, such as reduced face-to-face interaction between patients and healthcare professionals, challenges in monitoring medication dispensing, and increased risks to patient privacy and data confidentiality [23, 24]. Long-term succession planning has become more challenging for pharmacies in distant places due to difficulties in attracting and keeping pharmacists. As a result, residents frequently have to travel to the closest pharmacy or rely on online and mail-order services to get their prescriptions. For older persons who may have restricted mobility, inadequate support, or trouble accessing and utilizing information technology, this situation is especially tough. In this situation, utilizing technology presents a viable strategy for removing a number of obstacles to efficient patient care. Delivering high-quality pharmacy services to rural and regional areas in particular seems to be made possible by telemedicine, especially telepharmacy, which is an enabling technology (Figure 1) [4].

Figure 1. Concept of telepharmacy consultation.

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OBJECTIVES

1. Provide remote pharmaceutical services.
2. Enhance Clinical Decision Support.
3. Reduce Healthcare Costs.

ADVANTAGES OF TELEPHARMACY

1. Increased Access to Pharmaceutical Services.
2. Improved Medication Adherence.
3. Enhanced Patient Engagement.
4. Increased Efficiency.
5. Cost-Saving Process.

DISADVANTAGES OF TELEPHARMACY

1. Connectivity Issues.
2. Data Security.
3. Incapability to Perform Physical.
4. Language Barriers.
5. Licensure Conditions.

TELEPHARMACY

Like telemedicine, telepharmacy is a relatively new term that describes the delivery of pharmacological services. While tele comes from the Greek word "Telos," which means from a distance, medicine is derived from the Latin word "Meden," which means to heal [15]. The use of electronic information and communication technology to provide and support healthcare services when participants are physically separated is known as telemedicine [27]. Many telepharmacy models have been created in response to initiatives to remove obstacles to pharmacy service access [7]. Without the pharmacist physically being at the place of care, telepharmacy makes it possible to provide clinical pharmacy services including prescription dispensing remotely. Telepharmacy typically encompasses services such as patient counseling, drug information provision, dispensing, and compounding, medication order review, and therapeutic drug monitoring [8]. For hospitals in remote areas, telepharmacy offers an effective alternative to having pharmacists on-site around the clock for medication review. It has also been adopted by some healthcare organizations as a strategy to expand pharmacy coverage in locations without 24-hour pharmacy services. Advances in electronic health information systems and related technologies, including fax machines and electronic health records, now allow pharmacists to review patient information more efficiently before medications are administered. By leveraging these technologies, telepharmacy services continue to evolve, enabling pharmacists to more effectively promote the safe and responsible use of medications [9].

Electronic gadgets are becoming more and more accessible, including personal healthcare apps for smartphones and digital blood pressure and blood sugar monitors. In addition to giving people advice on whether these technologies are appropriate for their own health care, pharmacists play a significant role in supporting the usage of these technologies. To ensure that students are ready for the rapid advancements in technology when they enter the workforce, university curricula should better incorporate instruction on digital health. Telepharmacy is expected to be one of the most important components of telehealth in the years to come due to its capacity to provide greater opportunity for pharmacists, enhanced quality of services, quicker access to services, cost savings, improved patient satisfaction, convenience, and experience, and better health outcomes [18]. Patient outcomes and safety may benefit from telepharmacy. Clinical telepharmacy treatments in outpatient or ambulatory settings usually improved patient self-management, disease control, and medication adherence for the treatment of chronic illnesses, according to a 2017 systematic review (Figure 2) [28–29].

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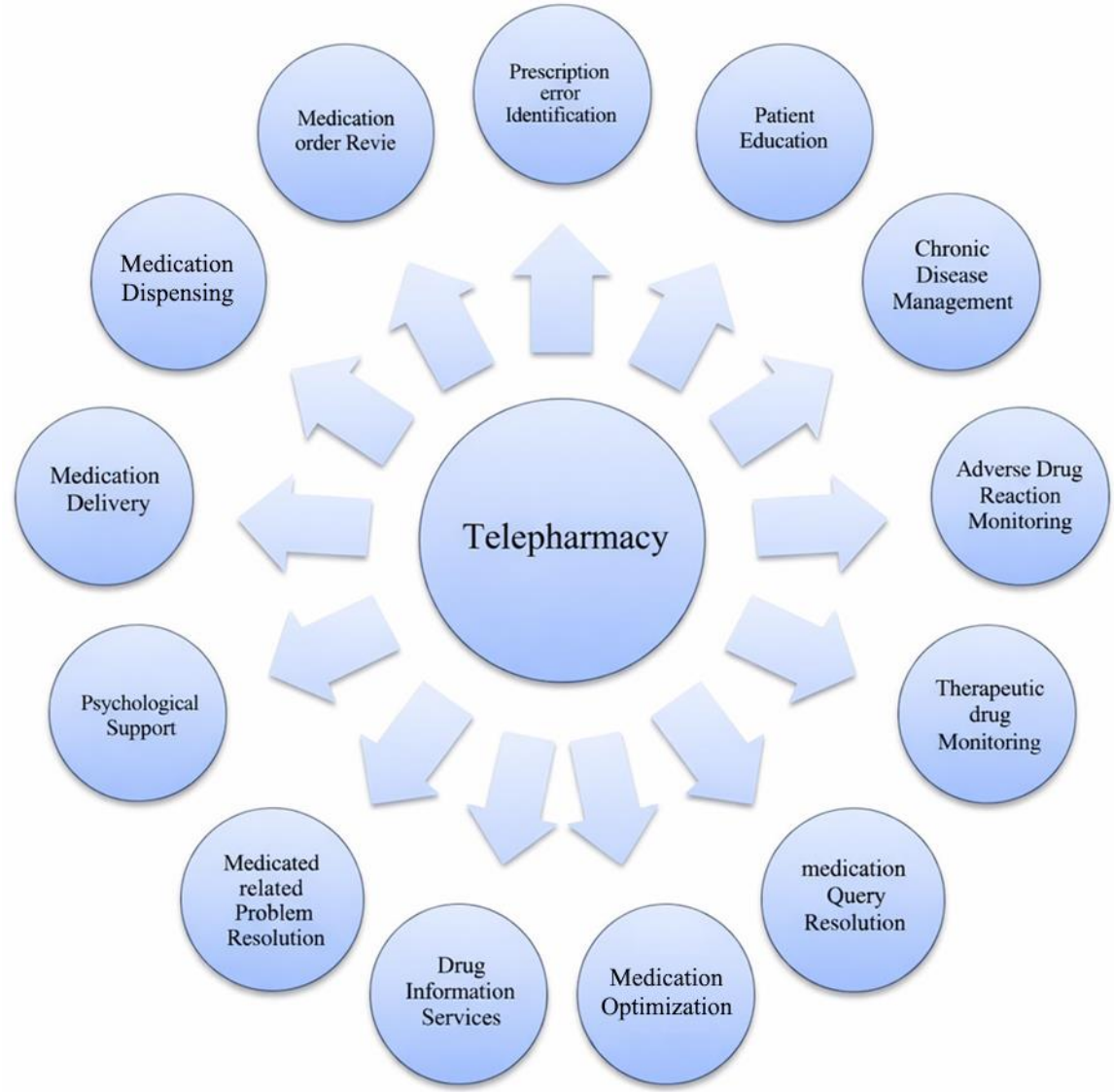

Figure 2. Various services and functions of Telepharmacy.

TYPES OF TELEPHARMACY

Inpatient (Remote Order-Entry Review)

Inpatient telepharmacy is the practice of a pharmacist working remotely to enter orders for a hospital's inpatient pharmacy. Before the hospital personnel gives the patient their medications, the remote pharmacist checks their instructions.

Remote Dispensing (Retail/Outpatient/Discharge)

A licensed brick and mortar pharmacy with a certified pharmacy technician working for it is known as a remote-dispensing facility. A pharmacist oversees the technician, reviews prescriptions, and carries out his or her responsibilities from a distance using technology. Think of it like a traditional pharmacy, but with the pharmacist off-site.

IV Admixture

A licensed brick and mortar pharmacy with a certified pharmacy technician working for it is known as a remote-dispensing facility. A pharmacist oversees the technician, reviews prescriptions, and carries out his or her responsibilities from a distance using technology. Think of it like a traditional pharmacy, but with the pharmacist off-site.

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Remote Counseling

Pharmacists that offer patient counseling remotely do it through live, interactive video sessions or, in some cases, through telecommunications [14].

Types of Telepharmacy Models

- *Traditional Full-Service Pharmacy:* This telepharmacy model provides services similar to a conventional pharmacy, including prescription dispensing, medication reviews, and patient counseling. These sites maintain a complete inventory of medications, encompassing both prescription and over-the-counter drugs, along with general merchandise and health and beauty products.
- *Remote Consultation Sites:* The central pharmacy prepares prescriptions, which are then transported to the remote locations. Counseling and instruction are provided to patients via computer links that use audio and video.
- *Hospital Telepharmacy:* In this model, prescriptions from rural hospitals are electronically sent to a hospital pharmacist at an urban medical center for review and verification. Once prepared, medications are dispensed via an automated dispensing machine (ADM). At the rural site, a nurse or pharmacy assistant double-checks the medication and label before it is administered to the patient. The central pharmacist supervises the verification process and, when needed, participates in consultations with patients, nurses, or physicians through videoconferencing.
- *Automated Dispensing Machines (ADMs):* Upon receiving a medication order electronically or by fax, the central pharmacist reviews the patient's profile, conducts a drug utilization review, and authorizes the ADM to dispense the medication. Patient counseling is then provided remotely using audio and video communication links [10].

PROCESS OF TELEPHARMCY

prescription Arrives at the Pharmacy

Prescriptions are entered via the pharmacy management system (PMS), just like in a conventional pharmacy. For a smooth, real-time experience, telepharmacy software connects with pharmacy management systems. This permits the pharmacy technicians working at the remote-dispensing location to concentrate on filling prescriptions.

Prescription Preparation

In a modern telepharmacy, a pharmacy technician prepares the prescription for dispensing once it arrives at the pharmacy. To ensure accuracy, the technician captures images of the prescription, medication labels, tablets, and bottles, clearly showing the lot numbers and expiration dates. These images, along with the patient's profile, are securely stored in the telepharmacy software and immediately accessible to the pharmacist at the host pharmacy location. After the pharmacist verifies the prescription, a complete audit log for each prescription is recorded in the system.

Pharmacist Review

The pharmacist examines the patient's medication profile for potential drug interactions and other issues before approving the prescription. Based on the review of the images, the pharmacist can either accept or reject the submission. If rejected, the pharmacist leaves notes for the technician explaining the discrepancy. If approved, the medication is packaged and placed in the will-call area for the patient. In a modern retail telepharmacy network, a single pharmacist may verify prescriptions for multiple pharmacy sites, or the workload may be distributed across several locations, helping to reduce overall costs.

Live-Video Patient Counseling

A patient must have a live, interactive video counseling session with the pharmacist prior to receiving prescription medication. During counseling, the remote pharmacist has easy access to all patient data, including medication history. Outcomes' HIPAA-compliant live-video HD connection ensures that patient counseling sessions are confidential, safe, and secure. As is frequently the case in traditional pharmacy settings, the patient-facing tablet is equipped with a connected handset that plugs into it to guarantee that the chat with the pharmacist is private and not overheard by other patients (Figures 3 and 4) [1].

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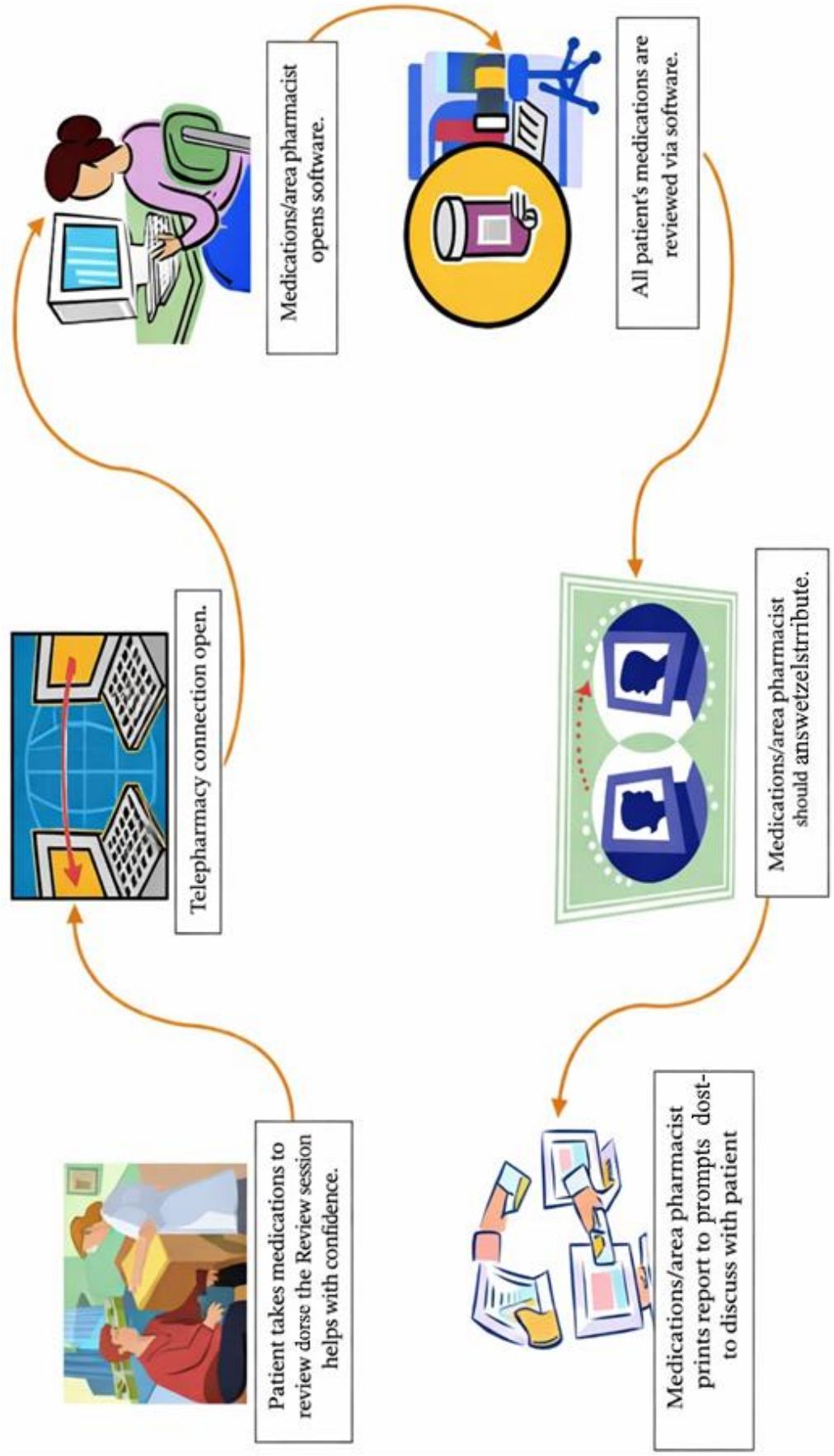

Figure 3. Workflow of telepharmacy consultation.

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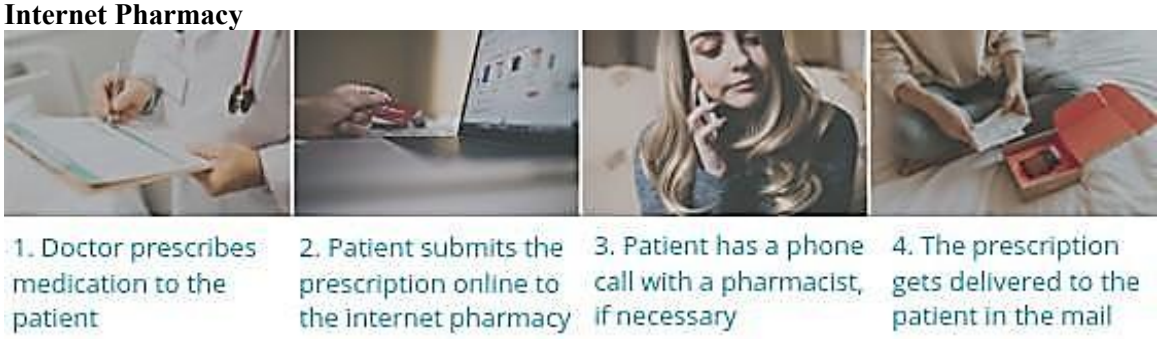
Internet Pharmacy



Telepharmacy

Figure 4. The difference between telepharmacy and internet pharmacy: [25].

Background of Telepharmacy

In the 1960s, the phrase “telemedicine” was coined [16]. All forms of informatics and telecommunications technology used to provide healthcare and disseminate educational materials to patients and populations have long since been added to the description. To differentiate the practice of drug use from the delivery of medical treatment remotely. In general, the term "telemedicine" is ambiguous and inconsistent. According to the Institute of Medicine, telemedicine is defined as the use of electronic information and communication technologies to deliver and support healthcare services when distance separates the participants [17].

Telepharmacy During Covid Pandamic

In December 2019, a coronavirus identified as SARS-CoV-2 was found in Wuhan, China [22]. Telepharmacy was soon recognized as a technique that might overcome many of the challenges posed by the pandemic and yet deliver high-quality patient care. However, traditionally, many pharmacies have been unable to implement telepharmacy due to a lack of appropriate regulation and funding [18, 19]. The COVID-19 pandemic hastened the improvements that would make telepharmacy a viable alternative [20]. This has enabled pharmacies to utilize low-cost teleconferencing platforms, such as Zoom or Skype, which might not have met privacy regulations under normal circumstances. Additionally, emergency legislation allowed chemists to provide COVID-19-related services such COVID-19 testing, vaccinations, and telepharmacy, regardless of state rules [20, 21]. Although these modifications improved telepharmacy's accessibility from a legal and financial standpoint, they are not long-term and did not offer implementation guidelines.

Telepharmacy: The Future of Pharmacy in India

During the epidemic in India, telehealth proved crucial in reducing the spread of new coronavirus infections, although society and the government were unaware of this. The use of non-pharmaceutical tactics, such as social distance and stay-at-home messaging via television, news, and telecommunication, greatly reduced the spread of the infection. Under the umbrella of telehealth, telemedicine, and telepharmacy offer remote medical services, such as clinical and non-clinical services, diagnosis monitoring, health education, and many more. Physicians typically provide

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telemedicine services, whereas pharmacists engage in telepharmacy. Telepharmacy is the precise provision of pharmacy services to patients who do not have personal interaction with pharmacists via video conferencing, Skype, Zoom, and other means. Telepharmacy services have seen a substantial global increase during the COVID-19 pandemic, including in India. During the epidemic, the pharmacists helped patients get the proper medication by using WhatsApp and telephony. Since doctors could only be reached by phone, pharmacists acted as a liaison between the patents and the doctors. Thus, telepharmacy has emerged as a potent instrument for providing healthcare throughout the healthcare system throughout the pandemic and has given pharmacists a great opportunity [30].

CHALLENGES FOR IMPLEMENTATION OF TELE-PHARMACY IN INDIA

1. Compliance of this technique by users.
2. Financial unavailability.
3. Literacy rate and language barriers.
4. Technical pressure.
5. Quality aspect.

CONCLUSION

Telepharmacy is a promising technique that could help people in remote and rural areas get better access to pharmaceutical care. Telepharmacy, which has the ability to offer high-quality pharmaceutical services like prescription monitoring, dispensing, patient counseling, and drug information, is rapidly becoming an essential component of contemporary pharmacy practice. Although there are still certain limitations on its use, telepharmacy may be an alternative for pharmaceutical services. In patients with diabetes mellitus, it has been demonstrated to be effective in providing therapies that produce noticeable improvements in clinical conditions and drug adherence.

This review of the research highlights the tremendous potential of telepharmacy and provides guidance for developing telepharmacy that can successfully help patients receive pharmaceutical treatments, especially those with diabetes mellitus. Telepharmacy adoption can help ensure adequate pharmaceutical assistance in underprivileged areas and may be a solution to the pharmacist shortage issue. A number of stakeholders are involved in the spread and adoption of telepharmacy; collaboration between the public and private sectors, as well as academic institutions and scientific organizations, is crucial to achieving pertinent outcomes and a meaningful advancement in healthcare.

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