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Review Paper

Telepharmacy in Modern Healthcare: Bridging Access Gaps Through Remote Pharmaceutical Care

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ABSTRACT

The document provides a comprehensive overview of telepharmacy as an emerging extension of telemedicine that enables pharmacists to deliver pharmaceutical care remotely using information and communication technologies. It highlights how telepharmacy improves healthcare accessibility, particularly for rural and underserved populations, by supporting medication dispensing, counseling, monitoring, and multidisciplinary coordination. The report discusses the rapid expansion of telepharmacy during the COVID-19 pandemic, demonstrating its effectiveness in maintaining continuity of care, enhancing therapy adherence, and reducing medication errors. Economic advantages include reduced operational costs and improved resource utilization. Despite its benefits, telepharmacy faces challenges such as technological limitations, data security concerns, regulatory gaps, financial constraints, and low digital literacy. The document further explores current applications, the role of pharmacists, clinical outcomes, and future developments including AI-driven solutions. Overall, telepharmacy emerges as a transformative model that strengthens healthcare delivery and supports safer, more efficient pharmaceutical care

INTRODUCTION

The Model State Pharmacy Act and Model Rules of the National Association of Boards of Pharmacy (Model Act) say that telepharmacy is "the provision of pharmacist care by registered pharmacies and pharmacists located within U.S. jurisdictions through the use of telecommunications or other technologies to patients or their agents at distances that are located within U.S. jurisdictions." It also defines terms like "coordinating pharmacy," "remote pharmacy," and "remote dispensing site" (1). In the previous few decades, technology has made enormous advancements that have improved the care of all doctors. This has enabled telehealth and its branches grow. Computers and phones can aid

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with health care that is far away. This is known as telehealth (2). Since the COVID-19 pandemic, this type of application of IT and information technology in health care has become more common. Using IT to deliver health services makes it easier for those who work in health care to conduct their jobs. Telemedicine is one of them. People have commented that telepharmacy is a smart and helpful technique to deal with this issue. The National Association of Boards of Pharmacy in the United States says that telepharmacy is when trained pharmacists help patients over the phone from a distance. Telepharmacy is what this is called. It helps pharmacists who work from home use their clinical skills to help more patients and centers (3). This also makes it easier to get healthcare resources (4). Telemedicine has proved that technology can transform the way healthcare is given since it lets people talk to one other from far away. This makes it easy for people to obtain help with their health. This is especially essential in locations that aren't huge cities. In the past year, the number of people using internet counsel has gone up seven times. This is a step toward a healthcare plan that will cover everyone, no matter where they live. Telemedicine has expanded significantly in just a few months, from 1% of general care visits to roughly 43.5%. This suggests that it can be utilized to give health care for a long time (1). The American College of Clinical Pharmacy sets criteria for how clinical pharmacists should do their jobs. These say that clinical pharmacists are good at doing full drug management (CMM). When you use Telehealth services, the meaning of care and the people who can give it don't alter. Most clinical pharmacists learn more about the CMM and get more skills and experience as part of their advanced clinical training. Clinical experience can also assist clinical pharmacists improve their skills (5). Telemedicine is a critical tool to keep care continuing amid global health catastrophes like the COVID-19 pandemic while also minimizing the danger of illness spreading. Telemedicine showed that it could adapt and be powerful during the pandemic by letting healthcare fire sales happen and making sure there was no possibility of contamination (6).

1.1 Telepharmacy

"Telepharmacy" is a newer word than "telemedicine," but they both indicate the same thing: administering medicine over the phone. There are several types of telepharmacy that help folks who can't get to stores. The National Association of Boards of Pharmacy defines telephone pharmacy as "the provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distance." With telepharmacy, people can get clinical pharmacy services and their prescriptions filled from afar, without having to see a pharmacist in person. As part of a routine telepsychiatry service, doctors check and fill out prescription orders, write new ones, chat to patients about their medications, give them advise, and keep a watch on their therapeutic drugs. Because of this, telepharmacy uses the latest technology to connect a competent pharmacist in one place with a pharmacy assistant or worker in another place. The pharmacist can then monitor over the dispensing of drugs using a computer link that sends speech and video.

There are occasions when hospitals that are far away can't have a pharmacist check on their patients' meds all day, every day. This might be an option. A number of healthcare groups have started doing this as a method to reach more locations without having to operate their stores 24 hours a day. There are more and more technology that make it easier for pharmacists to go over information before giving a patient a dose. These include fax machines, electronic health records, and more. These tools make it easier for

pharmacists to help individuals utilize their drugs better, and telepharmacy services are getting better as a result (7,8).

1.2 Telemedicine

"Tele" originates from the Greek word "Telos," which means "far away," and "medicine" comes from the Latin word "Meden," which means "to heal." Long-distance medical centers made this technology feasible so that people in remote areas who don't have access to medical care can get it. The World Health Organization argues that telemedicine has a lot of instruments and can be utilized for a lot of things. Most people think of telemedicine as phone calls, video chats, and the Internet. Telemedical therapies appear to be equally effective as in-person treatments, which accounts for their increasing popularity annually[51]. We used the Alberta Quality Matrix for Health, which was used in a prior scoping review15, to divide the benefits of telepharmacy into five groups: acceptability, accessibility, usefulness, speed, and safety. How well customers and pharmacists use telepharmacy affects how acceptable it is. What kind of person is this? See how delighted the patients are and how ready they are to use the technology again in the future (9)(10).

1.3 Purpose of Telepharmacy

Telepharmacy could help people in rural and hard-to-reach areas acquire the medicines they need more easily. A clinical pharmacist is a health care professional who has been trained to aid patients and medical staff with pharmaceutical issues. This service will help make up for the dearth of health care providers in rural and/or isolated areas. The pharmacist can do a variety of various things as part of tele-pharmacy, like delivering medications, working in an office, and providing clinical pharmacy services. As a dispensing chemist, you will be able to give out medicines and communicate to patients on video calls. The clinical chemist may work with doctors even when they are not in the same room because to electronic health records. When pharmacists aren't there, doctors at rural hospitals can do their jobs better because they make things safer for patients. Telepharmacy fills in the gaps in pharmaceutical care for people who live in remote areas (11). One way it does this is by employing robots and computers to bring pharmacy services to places that don't have them. There are various ways that telemedicine may benefit, yet a lot of individuals find it hard to use. Some of these are the requirement for technology infrastructure, worries about privacy and data security, and the need for tight laws to make sure that healthcare services are safe and of high quality. Some people may also find it harder to get the gadgets they need to get health treatment (12). That's why it's crucial to develop telemedicine legislation and norms that everyone can follow and profit from. Table 1 shows a summary of how telepharmacy was employed during the COVID-19 epidemic. This table highlights the many kinds of telepharmacy services (6)(10,13).

Table 1 - Telepharmacy implementation during the COVID-19 pandemic.

Telepharmacy Service Type	Key Tools & Technologies	Primary Benefits	Common Challenges	Strategies for Success
Remote Patient Monitoring (RPM)	Bluetooth-enabled blood pressure and glucose monitoring devices, cellphones, mobile applications, and	Enhances clinical results, such as improved management of HbA1c and	Problems with patients' access to and use of technology, particularly the elderly. Non-	Adapt technology to the demands of patients and train pharmacists and patients alike.

	interactive voice response (IVR) systems. SMS texting, encrypted online mail, and web-based communication.	blood pressure. results in lower medical expenses and hospital stays. improves self-care management and drug adherence.	automated data transfer to EHRs and poor data integrity. Time limits for patients and clinicians.	Utilize customized patient planning and technology. Create reliable alert management procedures.
Medication Counseling & Education	Social networking, mobile message apps, videoconferencing (like Microsoft Teams), and the phone. radio broadcasts, websites, and online portals.	Boosts patient trust and pleasure. enhances knowledge of drug use and side effects and medication adherence. makes it easier to get psychiatric help and drug information services.	Language obstacles and communication barriers. worries about data security and privacy on insecure sites. The inability of pharmacists to communicate remotely.	Make use of safe and regulated sites. Get the patient's permission before consulting them. Pharmacists should get ongoing education on communication techniques and telepharmacy ethics.
Prescription Review & Verification	Computerized provider order entry systems and electronic health records (EHRs). Prescriptions can be sent via fax, email, or secure web access. specialized software for verifying IV admixtures.	Allows for remote pharmacy operations oversight, expanding coverage in establishments without on-site pharmacists available around-the-clock. enhances patient safety and lowers medication mistakes. guarantees appropriate dosage modifications and continuity of care.	Inconsistency in state laws and licenses across state boundaries. systems that are incompatible across several facilities. Unbalanced workload and nonpayment for these particular services.	Encourage the adoption of uniform telepharmacy laws. Create precise procedures for entering and verifying orders remotely. Use technology that incorporates barcode checks and other in-process verification procedures.

Drug Dispensing & Delivery	Automated dispensing units, specialized delivery services, and intra-hospital telepharmacy software. applications for mobile devices that use GPS.	Intra-hospital telepharmacy software, automated dispensing machines, and specialty delivery services. applications for GPS-enabled mobile smartphones.	Errors in dispensing could occur when using remote monitoring. high upfront expenses for infrastructure and equipment. Personnel are not prepared to provide services.	Create cooperative delivery agreements between neighborhood pharmacists and hospitals. Make training investments for employees and invest in human resources. Reduce human mistake by utilizing automated, secure methods.
Multidisciplinary Care Coordination	Email, secure chat apps, and videoconferencing technologies. solutions for shared EHR access that are web-based and mobile.	improves the exchange of information and cooperation between doctors, pharmacists, and other medical professionals. enables pharmacists to provide clinical knowledge to several clinics. enhances the administration of medication for complicated patient situations.	Communication and information sharing between various health experts can be challenging. absence of a particular platform that protects patient confidentiality.	Establish a robust and safe communication framework for telepharmacy. Create documented collaborative processes and workflows. Train people in interdisciplinary communication and teamwork.

1.4 Involvement of Pharmacists

No matter how telepharmacy is set up, the chemist can aid with services. When a pharmacist uses telepharmacy models, they make sure that individuals in the community get good treatment, especially when it comes to checking drugs and giving patients guidance (7). The FIP pharmacy recommendations for controlling the pandemic made it apparent what pharmacists did during the COVID-19 epidemic and how to group those items. During the pandemic, pharmacy practices were divided into four divisions: prevention, preparation, reaction, and recovery. These groupings were created by Watson and others. Getting workers extra medicine, masks, and other safety gear, as well as coming up with new

methods to do things, are all things that can be done right away to minimize the health hazards of spreading SARS-CoV-2. One solution is what pharma firms are doing to cut down on face-to-face encounters for things like checking on drugs, bringing them to patients' homes, and making sure they are safe. To get healthy, you need to take steps to get back to normal life following the pandemic.

A study from 2013 found that the number of unfavorable drug events that were recorded dropped down when pharmacists looked at prescription orders from far away when the hospital pharmacy was closed. Every year, a few thousand people die because of bad pharmaceuticals and other medicine blunders. Experts think that bad drug effects that could have been avoided cost the US $2 billion a year. Also, a 2012 study in the United States indicated that telepharmacy services might have been used instead of having a pharmacist on-site 24/7 to check patients' prescriptions. This could have stopped people from having negative outcomes like extended hospital stays or possibly death (7,14).

Doctors all across the world are adopting telepharmacy more and more to keep an eye on their patients and make sure they take their medicines as advised. This is because more and more individuals are getting long-term diseases. This may help people use their medications correctly, avoid harmful drug responses, pay less for drugs, and get better therapy. We should be careful with telepharmacy models that don't include pharmacists directly, such Internet pharmacies, vending machine models, mail-order pharmacies, and models that give pharmacists' jobs to other health care workers, like nurses and doctors (7).

2. CLINICAL BENEFITS OF TELEPHARMACY IMPLEMENTATION

Telepharmacy can help people utilize drugs more easily and better, especially if they keep to their treatment programs. This is because clinical pharmacists assist patients comprehend their medications better, inform them when to take them, and call them often to make sure they understand their treatment (4,15).

2.1 Clinical Outcomes and Therapy Adherence Toward Telepharmacy: The COVID-19 Pandemic

Since the COVID-19 epidemic, people have been extra careful about how they touch each other so they don't get sick. Telepharmacy is a novel technique for pharmacists to serve individuals without needing to see them in person. It can be utilized as a different type of health care for those with diabetes. During the COVID-19 pandemic, people in Saudi Arabia who did not have type 2 diabetes could use telepharmacy. This is the focus of the investigation. A prospective single-cohort pre-post intervention methodology was employed in this study by a consortium of physicians, clinical pharmacists, diabetes educators, and other healthcare professionals. Doctors reviewed the patients' medical records and the most recent lab tests as part of the interventions. After that, the patients got the correct care, which included therapy and help from clinical pharmacists. They can also be sent to diabetic trainers if needed. A study examined the impact of the virtual clinic on clinical outcomes and medication adherence prior to and following the implementation of telepharmacy (16,17).

2.2 Teleconsultation and Diabetes Care Amid COVID-19 Pandemic in India

More than 972,000 people have gotten COVID-19, and more than 50,000 have died from it over the world. People in India are also getting sick. The Indian government's Ministry of Health and

Family Welfare has heard of 2650 confirmed cases and 68 deaths thus far (18,19).

A teleconsultation is when a doctor, a patient, or two doctors chat to each other electronically to find out what's wrong with a patient and/or treat them. Consultations can happen at the same time (in real time) through texts or calls, or they can happen at various times (asynchronously) using emails or faxes. These days, it looks like there is a lot of opportunity for teleconsultation because most individuals have cellphones. People with DM could benefit from teleconsultation. Patients can establish their own self-monitoring of blood glucose (SMBG) levels, which doctors can use to fine-tune their diabetes medications. This stops the patient's blood sugar levels from staying too high or too low for too long. People who used telemedicine had 0.44% less Glycated hemoglobin than people who only got regular treatment. After then, keeping blood sugar levels in check would probably make the body's defenses stronger, which would help stop the bad effects of COVID-19 (18,19).

2.3 Economic benefits for Pharmacist

Telepharmacy supports the business in a number of ways. It costs a lot more to open a new pharmacy than it does to buy the gear and pay a pharmacy tech for telepharmacy, according to reports. A good chemist can benefit more than one place. Costs are maintained low since it costs more to hire more pharmacists in rural areas and they get paid more. More than 60% of low-income patients who utilized a telepharmacy model claimed they wouldn't have been able to pay for their drugs without it. Telepharmacy saved a health system with a lot of hospitals a net of $1,132,144 per year (16).

3. APPLICATION OF TELEPHARMACY

Telemedicine is a field that is changing swiftly and has a lot of potential to improve healthcare. This is clear from the technologies and uses that are available presently. Telemedicine may now be utilized for many more clinical functions, such as diagnosis, patient tracking, training, and self-management, thanks to the addition of new ICTs. As telemedicine becomes more common in healthcare, it will be important to make sure that government standards, technical reliability, and data security are all in place (18,20).

3.1 Telemedicine in the Pharmaceutical Industry

The pharmaceutical industry is using telemedicine, which is a huge change in how health care is offered. This highlights how crucial digital health technologies (DHTs) are for patients with noncommunicable diseases (NCDs in low- and middle-income countries) to access care more easily. Telemedicine and DHTs are becoming more common in the medication market. Patients may now receive health care services more easily, and this has led to new ideas for how to enhance patient education, medication adherence, and health outcomes in general. This introduction talks about how telemedicine has revolutionized the pharma business and what that implies for patient care, how the industry employs health tech, and the overall health care system. The pharmaceutical sector also uses telemedicine to aid with global health issues like the COVID-19 epidemic. During the pandemic, it became evident how crucial it is to have health instruments that can reduce the spread of disease and make care better. Instead of keeping technology to themselves, the firm made it their job to bring people together from all over the world. This manner, people can access medicines and treatments that could save their lives, and it also makes the health care system in the globe stronger and more fair (6,21).

3.2 Expanding pharmacy services

Telepharmacy lets people perform things at the pharmacy even when the pharmacist isn't there or when the patient is being cared for. As of 2016, there weren't serious shortages of pharmacists in most parts of the country. But it's still challenging for folks in faraway places to find work. For a lot of tiny hospitals in rural locations, getting pharmacy services at the hospital depends on striking deals with drug stores nearby. When pharmacists operate from home, they don't have to check and review orders all the time. Instead, they can utilize their limited time on-site to conduct things like drug treatment, inventory, controlled substances, and developing new rules and procedures. Telepharmacy also lets one pharmacist work at more than one small hospital. This way, everyone can help pay for these services, and stores can stay open all the time. ASHP backs the establishment of telepharmacy services in remote areas so that more people can obtain clinical pharmacy services that address a wider range of needs. Telepharmacy services can assist other areas get more work done by allowing workers exchange tasks across the network and be available to help when needed (1,22).

3.3 Patient counseling and monitoring

Pharmacists have used phones to chat to patients about how to take their medicine correctly ever since phones were invented. A nationally accredited health facility in eastern Washington State has a program to reach out to people. FaceTime was utilized by pharmacists to talk to patients who lived far away for the first time in North Dakota. The Indian Health Service has also used this technology to send pharmacists to Alaska and other hard-to-reach areas of the U.S. The Navy has employed it all over the world. Some more examples are offering MTM by Skype, having a pharmacist handle anticoagulation, and giving people mental health care. Adding telemedicine services like telepharmacy to the urgent care unit made it easier to keep patients in the hospital longer. There were fewer difficulties that could have been prevented, and more people followed best practices. People are advocating mobile apps as a tool for pharmacists to talk to patients and aid them with their prescriptions and illnesses (1,23).

3.4 Virtual consultations and E-prescriptions

What are the newest telemedicine tools, and how may they be employed in the care of people with drugs? What are the good and bad things about utilizing them? The digitization of health care has greatly affected the drug sector. It has made it easier to purchase drugs and allowed doctors to diagnose and treat patients right away. People all throughout the world utilize e-prescriptions, mobile apps, and digital dose technology to get their medicines. This article talks about how crucial these tools are. These new technology have made it easier to give each patient the treatment they need. This has helped doctors and patients get along better and made it easier to think things through and figure out what to do. The authors underline how crucial it is to use digital tools to make pharmacy services better so that they can fulfill the demands of both patients and healthcare providers as they change (6,22,24).

3.5 Wearable devices and innovative health equipment

Here are some of the most important telemedicine tools and how they transform the way doctors and nurses care for patients. This section talks about how telemedicine could help individuals stay healthy, improve health care, and cut expenses. It also talks about how government rules can benefit telemedicine programs. This means that policymakers are starting to understand how telemedicine may help. Telemedicine is utilized in vascular surgery to highlight how digital health

tools could revolutionize the way patients are treated. The paper talks about how you can undertake teleconsultation, telemonitoring, and telecoaching on digital platforms. It talks about how telemedicine may help people see doctors who are far away, teach them more, and help them stick to their treatment programs and take care of themselves. Using telemedicine in clinical settings might be difficult, but this review illustrates how vital it is for improving individualized treatment and precision medicine (6,25).

4. CHALLENGES FOR IMPLEMENTATION OF TELE-PHARMACY IN INDIA (11)

User compliance with this technique: patients' lack of emotional attachment to doctors. However, because of their limited familiarity with technology, unskilled healthcare professionals find it challenging to persuade others to handle situations through telepharmacy (26).

Financial unavailability: Many hospitals and organizations cannot afford to adopt telepharmacy initiatives due to the high cost of technology and the devices that support it. Language obstacles and low literacy rates: The application of modern technology abilities is hampered by the great diversity of languages spoken by various populations (27).

Technical pressure: Telepharmacy still has to update with the newest designs, advancements in biological sensors, and improved connectivity solutions because it is still supported by a variety of outdated hardware and software.

Quality aspect: This technique of signing up for telemedicine will only happen after the standard steps have been taken. This will make sure that the basic safety rules are followed everywhere. India has to design and adopt a Telehealth Act that supports the program for keeping an eye on pharmaceuticals after they've been sold and allows people access to good health care.

Regulatory bodies: The government can help telemedicine flourish so that more people can obtain better health care. It is still in the beginning phases.

5. FUTURE DEVELOPMENTS

There are a lot of things that need to be done to make telepharmacy services better and more popular. There should be regulations and standards governing telepharmacy that protect people's privacy, safety, and cultural heritage. These should be worked for by groups of pharmacists and by individual pharmacists. Both users and doctors should learn as much as they can about telepharmacy. More people can utilize it if they know about it. Customers and doctors should be able to converse to each other more readily on a telepharmacy platform that is strong, safe, and easy to use. There also needs to be approved training programs for pharmacists right away so they can learn about the newest telepharmacy methods and get better at providing pharmaceutical services. During the conference, people with diabetes and other patients feel protected. This can help pharmacists get more recognition as professional health workers (4).

5.1 Identifying key barriers to telemedicine adoption in the pharmaceutical industry

There aren't enough doctors and nurses in the world, which is the largest concern. People are living longer and healthcare bills are rising higher, which makes this much worse. Some people have said that telemedicine can help with these stresses by making it simpler to discover problems early, administer preventative care, and instruct patients. But the fact that not many people utilize telemedicine yet illustrates that there are huge problems, such the fact that healthcare providers,

insurers, and other businesses work in different ways. We need to properly comprehend the benefits of telemedicine and come up with business models that work for everyone in order to tackle these problems (6).

5.2 Speculating on future developments in telemedicine technologies

People's health care demands are evolving, and telemedicine tools are growing better very quickly. This will make telepharmacy expand extremely quickly. This move could totally revolutionize the way pharmacological care is administered, making it easier, more focused, and more effective. There are a few things that will probably have a large effect on how pharmaceutical services are given in the future. These instances demonstrate unprecedented potential collaborations between technology and healthcare (6,28).

Telepharmacy will probably use a lot of deep learning and artificial intelligence (AI). They can help with everything from making sure that every patient gets the correct amount of care to making better use of medicines. AI helps pharmacies make sure that everyone gets the correct care by looking at patient data. This speeds up the process. AI can speed up the process of filling prescriptions and better handle products at the same time. This lowers the number of mistakes and raises the quality of service (6).

There are a lot of intriguing things happening in the world of telepharmacy. It might make healthcare a lot better and help people get better results. If you want to get the most out of telepharmacy, you need to be open to new ideas and know what problems they could cause. To make the healthcare system of the future more efficient, accessible, and individualized, healthcare professionals, engineers, regulators, and patients will all need to work together. Telepharmacy will be a key feature of that system (6,29).

CONCLUSION

Telepharmacy made it easier for pharmacists to do their jobs when COVID-19 broke out. But many are still arguing over how much telepharmacy would cost and how it will affect patients. Hospital pharmacists, pharmacy groups, stakeholders, the government, and academics should all think about telepharmacy a lot. They should think about things like how ready the technology infrastructure is, what types of pharmaceutical services will be supplied, and how professionals from diverse areas may work together [46]. There are still certain regulations concerning how telepharmacy can be used, but it could be a new way to obtain support with your prescriptions. People with diabetes mellitus have been given treatments that have been demonstrated to help them stay healthy and remain with their therapy. This literature review examines numerous trials to demonstrate the potential benefits of telepharmacy. It can help patients, especially those with diabetes, access the medical treatment they need (3,6,30,31).

REFERENCES

1. Alexander E, Butler CD, Darr A, Jenkins MT, Long RD, Shipman CJ, et al. ASHP Statement on telepharmacy. Vol. 74, American Journal of Health-System Pharmacy. American Society of Health-Systems Pharmacy; 2017. p. e236–41.
2. Gehrke M, De Guzman KR, Ryan M, Snoswell CL. Remote patient monitoring outpatient telepharmacy services: a systematic review. Research in Social and Administrative Pharmacy. Elsevier Inc.; 2025.
3. Miller IF, Becker AD, Grenfell BT, Metcalf CJE. Disease and healthcare burden of COVID-19 in the United States. Nat Med. 2020 Aug 1;26(8):1212–7.
4. Iftinan GN, Elamin KM, Rahayu SA, Lestari K, Wathoni N. Application, Benefits, and

Limitations of Telepharmacy for Patients with Diabetes in the Outpatient Setting. Vol. 16, Journal of Multidisciplinary Healthcare. Dove Medical Press Ltd; 2023. p. 451–9.

5. Le T, Toscani M, Colaizzi J. Telepharmacy: A New Paradigm for Our Profession. Vol. 33, Journal of Pharmacy Practice. SAGE Publications Inc.; 2020. p. 176–82.
6. Chioma Anthonia Okolo, Jeremiah Olawumi Arowoogun, Rawlings Chidi, Adekunle Oyeyemi Adeniyi. Telemedicine's role in transforming healthcare delivery in the pharmaceutical industry: A systematic review. World Journal of Advanced Research and Reviews. 2024 Feb 28;21(2):1836–56.
7. Poudel A, Nissen L. Telepharmacy: a pharmacist’s perspective on the clinical benefits and challenges. Integr Pharm Res Pract. 2016 Oct;Volume 5:75–82.
8. Johnson PE, Hayes JM. Medication use in schools. Vol. 63, American Journal of Health-System Pharmacy. American Society of Health-Systems Pharmacy; 2006. p. 1277–85.
9. Sarasmita MA, Sudarma IW, Adi Jaya MK, Irham LM, Susanty S. Telepharmacy Implementation to Support Pharmaceutical Care Services during the COVID-19 Pandemic: A Scoping Review. Vol. 77, Canadian Journal of Hospital Pharmacy. Canadian Society of Hospital Pharmacists; 2024.
10. Unni EJ, Patel K, Beazer IR, Hung M. Telepharmacy during COVID-19: A Scoping Review. Pharmacy. 2021 Nov 11;9(4):183.
11. Joshi G, Jindal K, Goutam N, Sharma A. Telepharmacy: A Review [Internet]. Vol. 17. 2020. Available from: www.ijppr.humanjournals.com
12. Pathak S, Haynes M, Qato DM, Urick BY. Telepharmacy and quality of medication use in rural areas, 2013-2019. Prev Chronic Dis. 2020;17.
13. Thompson B, Conrad G, Gum MO, Kessler JM, Larson T, Moore D, et al. ASHP guidelines on remote medication order processing. American Journal of Health-System Pharmacy. 2010;67(8):672–7.
14. Pal R, Bhadada SK. COVID-19 and non-communicable diseases. Vol. 96, Postgraduate Medical Journal. Oxford University Press; 2020. p. 429–30.
15. Di Cerbo A, Morales-Medina JC, Palmieri B, Iannitti T. Narrative review of telemedicine consultation in medical practice. Vol. 9, Patient Preference and Adherence. Dove Medical Press Ltd.; 2015. p. 65–75.
16. Iftinan GN, Wathoni N, Lestari K. Telepharmacy: A potential alternative approach for diabetic patients during the COVID-19 pandemic. Vol. 14, Journal of Multidisciplinary Healthcare. Dove Medical Press Ltd; 2021. p. 2261–73.
17. Casey MM, Sorensen TD, Elias W, Knudson A, Gregg W. Current practices and state regulations regarding telepharmacy in rural hospitals. American Journal of Health-System Pharmacy. 2010 Jul 1;67(13):1085–92.
18. Banerjee M, Chakraborty S, Pal R. Teleconsultation and Diabetes Care Amid COVID-19 Pandemic in India: Scopes and Challenges. J Diabetes Sci Technol. 2020 Jul 1;14(4):714–5.
19. Di Gennaro F, Pizzol D, Marotta C, Antunes M, Racalbuto V, Veronese N, et al. Coronavirus diseases (COVID-19) current status and future perspectives: A narrative review. Vol. 17, International Journal of Environmental Research and Public Health. MDPI AG; 2020.
20. Zhang J jin, Dong X, Cao Y yuan, Yuan Y dong, Yang Y bin, Yan Y qin, et al. Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. Allergy:

European Journal of Allergy and Clinical Immunology. 2020 Jul 1;75(7):1730–41.

21. McLaughlin M, Kotis D, Thomson K, Harrison M, Fennessy G, Postelnick M, et al. Effects on patient care caused by drug shortages: A survey. Journal of Managed Care Pharmacy. 2013;19(9):783–8.
22. Goodridge D, Marciniuk D. Rural and remote care. Vol. 13, Chronic Respiratory Disease. SAGE Publications Ltd; 2016. p. 192–203.
23. Badowski ME, Walker S, Bacchus S, Bartlett S, Chan J, Cochran KA, et al. Providing Comprehensive Medication Management in Telehealth. Pharmacotherapy. 2018 Feb 1;38(2):e7–16.
24. Baldoni S, Amenta F, Ricci G. Telepharmacy services: Present status and future perspectives: A review. Vol. 55, Medicina (Lithuania). MDPI AG; 2019.
25. Lauffenburger JC, Ghazinouri R, Jan S, Makanji S, Ferro CA, Lewey J, et al. Impact of a novel pharmacist-delivered behavioral intervention for patients with poorly-controlled diabetes: The ENhancing outcomes through Goal Assessment and Generating Engagement in Diabetes Mellitus (ENGAGE-DM) pragmatic randomized trial. PLoS One. 2019 Apr 1;14(4).
26. Ansarian M, Baharlouei Z. Applications and Challenges of Telemedicine: Privacy-Preservation as a Case Study. Vol. 26, Archives of Iranian Medicine. Academy of Medical Sciences of I.R. Iran; 2023. p. 654–61.
27. Ansah EW, Menyanu EK. Factors Influencing Drug Use Information Received at Primary Healthcare Centre Pharmacies in Ghana. Health Serv Insights. 2022;15.
28. Holdford DA, Inocencio TJ. Adherence and persistence associated with an appointment-based medication synchronization program. Journal of the American Pharmacists Association. 2013;53(6):576–83.
29. M Tourkmani A, J ALHarbi T, Rsheed AMB, Alrasheedy AA, ALMadani W, ALJuraisi F, et al. The impact of telemedicine on patients with uncontrolled type 2 diabetes mellitus during the COVID-19 pandemic in Saudi Arabia: Findings and implications. J Telemed Telecare. 2023 Jun 1;29(5):390–8.
30. van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. New England Journal of Medicine. 2020 Apr 16;382(16):1564–7.
31. Parikh D, Sattigeri B, Kumar A. An update on growth and development of telemedicine with pharmacological implications. Int J Med Sci Public Health. 2014;3(5):527.

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