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Review on: Telepharmacy

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Abstract: The use of information and telecommunication technologies has expanded at a rapid rate, which has a strong influence on healthcare delivery in many countries. Rural residents and communities, however, often lack easy access to healthcare services due to geographical and demographical factors. Telepharmacy, a more recent concept that refers to pharmaceutical service provision, enables healthcare services, such as medication review, patients counseling, and prescription verification, by a qualified pharmacist for the patients located at a distance from a remotely located hospital, pharmacy, or healthcare center. Trends in telemedicine show that telepharmaceutical care is likely to continue to expand as it allows for a better allocation of resources and access to more patients. Telepharmacy has many recognizable benefits such as the easy access to healthcare services in remote and rural locations, economic benefits, patient satisfaction as a result of medication access and information in rural areas, effective patient counseling, and minimal scarcity of local pharmacist and pharmacy services.

Index Terms - Telepharmacy, Telecommunication, Telepharmaceutical, Medication access, Telehealth.

I. INTRODUCTION

Telepharmacy analogous to telemedicine, is a more recent concept that refers to pharmaceutical service provision. Strategies to address the barriers to accessing pharmacy services have resulted in the creation of several models of telepharmacy. The National Association of Boards of Pharmacy defines —telepharmacy as —the provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distance. Telepharmacy delivers clinical pharmacy services [1] Telepharmacy is considered to be a way of delivering pharmaceutical products and care by the means of telecommunication to different patients. This way patients can receive their medicines and other pharmaceutical care items in the comfort of where they can get the services easy. Some of the services given are patient counseling, drug therapy monitoring, and refill authorization for the prescribed drugs, monitoring or formulary compliance by the means of videoconferencing or teleconferencing and prior authorization of prescribed drugs. Other services are taking medicines to remote places and also labeling the systems. These services can be given at your retail pharmacy places or even through the nursing homes, hospitals, and other medical facilities. The word can also mean using videoconferencing in the pharmacy world to give other services like training, education, and also management services to the pharmacists. [Telehealth is the use of electronic information and telecommunication technologies to provide long-distance health care and education to patients. And these strategies are used to provide patient care services and optimize subsequent outcomes from a distance. During the 20th century, the use of information and telecommunication technologies has expanded at a rapid rate. This expansion has strongly influenced healthcare delivery in many countries. The availability of the Internet has created more informed consumers who demand more of healthcare professionals. However, a shortage of healthcare services and trained healthcare professionals, especially in the rural and regional areas, often hinders appropriate treatment and care for patients. [4,5] Pharmacies that currently operate in remote areas face the problem of service sustainability because of recruitment and retention of pharmacists, leading to difficulties in creating succession plans. As such, residents have to either drive to the nearest pharmacy or use

mail order or online service to fill their prescription, which is a particular concern for frail individuals with limited mobility and limited support or without the connection/competence of information technology. Technology has emerged as a potential mean to overcome some of these obstacles to patient care. Telemedicine, particularly telepharmacy, appears to be an enabling technology that represents a unique and innovative way to deliver quality pharmacy services to rural and regional areas particularly.

2. Telepharmacy

Telepharmacy, analogous to telemedicine, is a more recent concept that refers to pharmaceutical service provision. Strategies to address the barriers to accessing pharmacy services have resulted in the creation of several models of telepharmacy. The National Association of Boards of Pharmacy defines —telepharmacy as —the provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distance.[7] Telepharmacy delivers clinical pharmacy services and the dispensing of a prescription at a remote location without the physical presence of a pharmacist. Typical telepharmacy involves services such as medication order review, dispensing and compounding, drug information services, patient counseling, and therapeutic drug monitoring. Hence, telepharmacy uses state-of-the-art technology World Journal of Pharmaceutical and Life Sciences that allows a qualified pharmacist situated at a central location to supervise a pharmacy assistant or a pharmacy technician situated at a remote site in the dispensing of pharmaceuticals through audio and video computer links. Telepharmacy acts as a potential alternative to around the clock on-site pharmacist medication review for remote hospitals. This has been adopted by many healthcare institutions as an alternative strategy of extending pharmacy coverage in areas where 24-hours pharmacy services are not available. The emerging electronic health information systems and related technologies, such as fax, and electronic health records make information more readily available to pharmacist for review before a dose is available for administration to a patient. These technologies are advancing telepharmacy services and enabling pharmacist to contribute efficiently in improving medication use.

2.1 Working of telepharmacy

In general, a small rural hospital, pharmacy, or clinic in an isolated area is connected to a commonly utilized service model in larger urban center that has greater access (often 24 hours) to pharmacist staff. This connection is possible through videophone systems, novel software, and automated dispensing machine.[11] The rural site is usually staffed by either pharmacy technicians or nurses, depending on whether the site is a pharmacy or a clinic. They may communicate the prescriptions (eg, fax) from patients who report to these sites to the central site, which is then processed by a qualified Automated dispensing machine, however, are not always affordable for small rural hospitals or clinics. www.wjpls.org | Vol 8, Issue 3, 2022. | An alternative was developed by researchers in Fargo, ND, USA, where a technician under the videoconference supervision of a central pharmacist at a distant location prepares medication for dispensing, repackaging, and relabeling.[12] These medications are then directly delivered to the nurse by the pharmacy technician or are dispensed through automated dispensing devices (when available). In another example, to facilitate 24-hour access to the pharmacist by physicians and nurses in the patient care area for face-to-face consultation and communication, a wireless mobile technology cart has been developed for use in remote hospitals.[13]

2.2 Working of telepharmacy

in pandemic situation Changes attitudes towards telehealth systems after COVID-19 The covid-19 pandemic is the spread of the SARS-COV-2. SARS-COV-2 is a highly contagious virus that was discovered at the end of 2019. Infection by the virus can lead to mild to severe respiratory illness and potentially death. Due to the virus, WHO recommends physical distancing to minimize the spread of the virus. As a result of the covid-19 pandemic, changed attitudes towards the use of telehealth have been obtained. A study by Kirihera and 3. Types of telepharmacy models Table 1: Types of telepharmacy.[12] Traditional full-service pharmacy World Journal of Pharmaceutical and Life Sciences colleagues has shown changed attitudes towards the use of different telehealth systems of individuals with Parkinson Disease utilizing telemedicine. The individuals expressed more positive attitudes towards telehealth during covid-19 than before the pandemic, as more individuals have been interested in establishing online contact with their therapist than before the covid.

3. Types of telepharmacy models

Traditional full-service pharmacy	Like traditional pharmacies, this telepharmacy site encompasses services such as filling prescriptions, medication reviews, and patient counseling. These telepharmacy sites have complete drug inventories that include prescription and over the counter medications along with other-health-and beauty aids and other general merchandise
Remote consultation site	Prescriptions are prepared at the central pharmacy and are delivered to the rural sites. Audio and video computer links are used to deliver patient counseling and education
Hospital telepharmacy	Hospital pharmacist in urban medical center reviews processes and verifies the prescriptions that are issued and electronically sent from rural hospitals. Automated dispensing machine (ADM) is used to electronically release the
ADMs	Pharmacist at a central location uponreceiving drug order (electronically or by fax) confirms the patient profile, conducts proper drug utilization review, and finally instructs the ADM to release the medication. With the help of audio and video computer links, patient counseling is then conducted

4. How does telepharmacy differs from internet pharmacy?

A. Internet pharmacy An online pharmacy, internet pharmacy, or mail-order pharmacy is a pharmacy that operates over the Internet and sends orders to customers through mail, shipping companies, or online pharmacy web portal.[14] Internet pharmacies are online drug stores that ship medications to patients. As stated, internet pharmacy does provide a level of convenience for patients when executed properly. B. Telepharmacy Telepharmacy works just like any traditional pharmacy; the pharmacist's scope of practice remains exactly the same. Everything a pharmacist does in a traditional pharmacy they do in a telepharmacy. When a patient visits a telepharmacy, they have a nearly identical experience as they do with a traditional pharmacy local pharmacist from the equation, takes business away from the local economy, and funnels it into the pockets of big businesses located elsewhere. Telepharmacy is a toolpharmacists can use to ward off the threats posed by internet pharmacy, decreased reimbursement rates, physician dispensing, and other threats to pharmacy practice.

5. Telepharmacy: Past, Present, Future

5.1 Past: While this may sound surprising, telepharmacy is quickly approaching its 20th birthday. In 2000, the North Dakota State Board of Pharmacy reported that 26 of the state's rural communities had lost their community pharmacies and a dozen more communities were at risk of losing their community pharmacies. In response, the board established pilot rules for telepharmacy in 2001 in the hopes that the virtual service could help the state's medically • The process works just like it does with traditional pharmacy. underserved remote rural communities restore and retain pharmacy services. a) Wrapping Up Internet pharmacy and telepharmacy could not be more different in how they work, how safe they are in practice, or in how they affect pharmacists. Driving business to online vendors might lead to another pharmacy closing, and an already underserved population losing yet another healthcare professional. Internet pharmacy removes the.

5.2 Present: If there was no pandemic, a section on telepharmacy's role in healthcare today would have sounded a lot like how the previous section ended: optimism about its future but also some uncertainty about how quickly adoption and growth would occur and to what extent. But COVID-19 came along, and the value of telepharmacy — like other forms of telehealth — has become even more apparent.

5.3 Future: As Healthcare IT News notes, a recent Kyruus survey found that about three-quarters of patients who have received virtual care during the pandemic said they want to see it become a standard part of care. As is likely apparent, we're quite bullish on telepharmacy. While we anticipate that at least some of the federal, state, and private payer decisions that eliminated barriers and/or improved access to telehealth, and subsequently telepharmacy, during the pandemic will be rolled or scaled back once the worst of the pandemic is behind us.

6. Telepharmacy market scenario Research

analyses the market to reach USD 123.57 million by 2028, growing at a CAGR of 6.19% during the aforementioned forecast period. The growing awareness among the patients regarding the benefits of telepharmacy which will create lucrative opportunities for the growth of the market. The growing access to quality health care service in medically backward and rural areas, rising number of internet penetration coupled with rising internet users, surging volume of patients suffering from infectious diseases such as Covid19, and others, increasing preferences towards online health services to limit exposure and risk of infection are some of the major as well as important factors which will likely to accelerate the growth of the telepharmacy market in the projected timeframe of 2021-2028. On the other hand, unavailability of pharmacists in hospitals, rural area hospitals that cannot afford pharmacists, prevalence of insufficiently skilled pharmacist along with prevalence of favourable government initiatives to support telemedicine and increasing healthcare expenditure which will further contribute by generating immense opportunities that will led to the growth of the telepharmacy market in the above mentioned projected Research analyses the market to account to USD 123.57 million by 2028 growing at a CAGR of 6.19% in the above-mentioned forecast period. The growing awareness among the patients regarding the benefits of telepharmacy which will create lucrative opportunities for the growth of the market. The growing access to quality health care service in medically backward and rural areas, rising number of internet penetration coupled with rising internet users, surging volume of patients suffering from infectious diseases such as Covid19, and others, increasing preferences towards online health services to limit exposure and risk of infection are some of the major as well as important factors which will likely to accelerate the growth of the telepharmacy market in the projected timeframe of 2021-2028. On the other hand, unavailability of pharmacists in hospitals, rural area hospitals that cannot afford pharmacists, prevalence of insufficiently skilled pharmacist along with prevalence of favourable government initiatives to support telemedicine and increasing healthcare expenditure which will further contribute by generating immense opportunities that will led to the growth of the telepharmacy market in the above mentioned projected.

Telepharmacy Benefits:

Telepharmacy can help provide convenience while improving the quality of drug use, especially in terms of patient therapy compliance. This is due to the pharmaceutical services provided by clinical pharmacists in providing education about the drug therapy currently being used by patients regular reminders of when to take drugs and regular follow-up calls by pharmacists so that patients become more aware of the therapy they are currently undergoing.

Telepharmacy has also helped cut down on the number of hospitalizations and doctor visits that patients have to make This could be because pharmacists use pharmaceutical care plans and services, which include preventing and treating problems with drug therapy that can lead to serious problems and the need to stay in the hospital. Several similar studies also found that pharmacist-led self-care counseling and training cut down on the number of hospitalizations and complications caused by diabetes.

Several studies examining the effectiveness of telepharmacy services in the COVID-19 era show that telepharmacy improves drug delivery practices, helping to improve patient access to pharmaceutical services Therefore, the fact that telepharmacy exists can help make up for the lack of pharmacists in rural or remote areas, where diabetic patients and other patients can easily get access to pharmaceutical services. In addition, telepharmacy also offers a more comfortable environment for pharmacists and patients to consult with patients without the risk of transmitting viruses.

Significant improvements in dietary and physical activity behaviors were also seen with the use of telepharmacy, which is likely due to the provision of education and educational materials regarding types and proportions of healthy diets and encouraging patients to engage in regular physical activity.

Telepharmacy Limitations

Telepharmacy practice, which is now widely used, still has some limitations. Consultation and counseling by pharmacists through telepharmacy focus more on improving patient adherence and clinical outcomes, not many telepharmacies provide education and information about self-management and self-activity of diabetes mellitus patients such as education about foot care, smoking, diet management, and weight reduction. There is a strong relationship between patient knowledge about the disease and medication adherence. It is hypothesized that well-informed patients have a better understanding of their disease and treatment process. Compared to traditional pharmaceutical services, telepharmacy is more vulnerable to privacy and security risks. For the broader application of telepharmacy, there are concerns about the privacy and security of the telehealth system. The telepharmacy provider must be responsible for ensuring regulatory compliance, patient

confidentiality, and system security at all times. In addition to knowledge of the legal aspects of telepharmacy, it is important for providers to know and practice telepharmacy ethics. These ethical standards must be observed when pharmacists work remotely from home or make outpatient visits at their respective residences.

Some of the telepharmacy services provided also require special devices that are usually used to monitor the patient's daily blood sugar levels, telepharmacy that uses special devices also needs to provide comprehensive training to patients before using these devices, considering that diabetes mellitus patients are usually in their old age and are rarely exposed to technology, so they may experience difficulties.

With the rapid advancement of technology in the health sector, education on telepharmacy is very important, not only for pharmacists but also for patients. To get more people to use it, a formal continuing education program could keep pharmacists up to date on how telepharmacy is used today.

Future Developments

Going forward, many steps need to be done to ensure the use of telepharmacy services growing and getting better. Pharmacist associations and pharmacists need to advocate for laws and regulations regarding telepharmacy that can guarantee security, privacy and legacy. Telepharmacy education not only for pharmacists but also for patients is also very important, the more telepharmacy education the more telepharmacy can be used widely. To facilitate communication between pharmacists and patients, a powerful, secure, and needs-based telepharmacy platform must be considered during creation. Additionally, there is a critical need for formal education programs to support pharmacists in maintaining their knowledge of modern telepharmacy procedures and their proficiency in offering pharmaceutical services. The general patients, and diabetes patients, feel secure during the consultation and, ultimately, can increase the existence of pharmacists as high-quality health workers.

Limitations

This literature review has limitations; maybe not all articles discuss the role of telepharmacy in patients with diabetes mellitus, because it depends on how the role of the pharmacist is described in articles. In addition, this study also focuses on discussing the benefits of telepharmacy in improving clinical outcomes and patient compliance, so that the output regarding cost and operational effectiveness is not discussed. However, the authors hoped that this literature review can become a reference in the future development of telepharmacy, especially for diabetes mellitus patients whose goal is to continue to provide high-quality pharmaceutical services.

Conclusion

Telepharmacy might be a different option for pharmaceutical services, even though there are still some restrictions on its use. It has been shown to be successful in giving interventions with notable results in clinical conditions and adherence to therapy in patients with diabetes mellitus. This literature review demonstrates the enormous potential of telepharmacy and serves as a guide for the creation of telepharmacy that can effectively assist patients, particularly those with diabetes mellitus, in receiving pharmaceutical services.

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