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# Digital Transformation Of Pharmaceutical Care

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**Abstract:** The paper discusses the key advantages of telepharmacy, its role in the healthcare system, as well as the prospects for the use of mobile applications and digital solutions to expand access to pharmaceutical services and represents a modern direction of digital health care that provides remote provision of pharmaceutical services using information and communication technologies. One of the most significant areas is telepharmacy, which allows to provide access to pharmaceutical services regardless of the patient's geographical location.

**Keywords:** Telepharmacy, telemedicine, emergency care, digital healthcare, innovation, pharmaceutical services.

**Introduction:** Telepharmacy plays a key role in increasing the availability of pharmaceutical services and reducing the burden on the healthcare system. It provides consultative support to patients, pharmacotherapy control, and also contributes to increasing the level of responsibility and involvement of patients. The development of digital technologies has led to large-scale transformations in the healthcare sector. pharmaceutical services has increased significantly. Telepharmacy is of particular importance for rural areas and in emergency situations.

A significant contribution to the institutionalization of digital technologies is made by the International Pharmaceutical Federation (FIP), which has created a Technical Advisory Group to analyze the possibilities of introducing information and communication technologies into pharmaceutical practice. The integrated use of electronic prescriptions, electronic medical records, telemedicine and telepharmacy, m-health, as well as remote monitoring and artificial intelligence technologies contributes to improving the quality of pharmaceutical care and expanding access to it.

## METHOD

One of the most illustrative examples of the successful implementation of telepharmacy is the activities of TelePharm, founded in 2012 in Iowa (USA). The organization was created as a practical solution to the problem of the shortage of pharmacists in rural areas. The model proposed by TelePharm is based on the use of secure video communication channels and cloud technologies, which makes it possible to maintain the activities of dozens of pharmacies and open new facilities in those places where the full presence of a pharmacist was impossible. TelePharm has proposed an innovative model: patients come to the pharmacy, where the pharmacist connects to them via secure video communication, advises and controls the dispensing of medicines using cloud technologies and special software solutions. Today, TelePharm is considered one of the leading organizations that have proven the effectiveness of telepharmacy as a sustainable model that provides access to high-quality pharmaceutical services

A telepharmacy study was conducted at the Mayo Clinic Health System (Rochester ED, Minnesota, USA) from November 2018 to November 2020. The Mayo Clinic is a not-for-profit academic medical center that is based in Rochester, Minnesota, and focuses on comprehensive clinical practice, education, and research. It employs more than 4,500 physicians and scientists, as well as 58,400 administrative and allied medical staff. Mayo Clinic Rochester specializes in treating complex cases through tertiary care and prescription medicine. It is home to Alix Clinic's top ten medical schools, as well as many of the largest and

most respected educational programs in the United States. The clinic spends more than $660 million a year on research and has more than 3,000 full-time researchers.The study involved 24 pharmacists who provided remote consultations. During this period, 279 calls and 435 interventions were recorded, almost half of the calls came from critical access hospitals (48.7%). The most frequent interventions were: selection and dosage of medications (238 cases), antibiotic therapy (141), monitoring and follow-up (65), discharge support (56), provision of medication information (55) and allergy review (50).

**DISCUSSION AND RESULTS**

The study found that telepharmacy significantly increases access to pharmacy expertise, improves the safety of treatment, and plays an important role in helping resource-constrained regions. Telepharmacy contributes to lower costs for individuals and healthcare systems, increases patient satisfaction, improves patient experience, and delivers better health outcomes, priority of the International Pharmaceutical Federation. Digital health is one of the 21 global development goals proclaimed by the Federation in 2020. The prospects of telepharmacy are associated with the introduction of intelligent systems that allow predicting and adjusting drug dosages based on patient parameters. Combining this dose optimization with electronic EHRs and smart infusion pumps will minimize manual adjustments and reduce the potential for errors. Hospital providers will play an important role in this transformation, offering specialized care at any stage of the disease and collaborating with colleagues outside the hospital to create a truly seamless system of care. In addition, the use of data from wearable devices and rapid tests will allow pharmacists to provide personalized recommendations and personalized treatment

.Mobile apps are becoming a critical tool for digital health, providing health monitoring, medication reminders, and remote interaction with pharmacists. The use of mobile solutions in pharmaceutical practice includes clinical support, remote monitoring, reference and information functions and organization of access to medicines. The international standard ISO 82304 provides quality control of medical applications and their labeling. Examples of specialized solutions are Telefarmacia App and TelePharm Cons

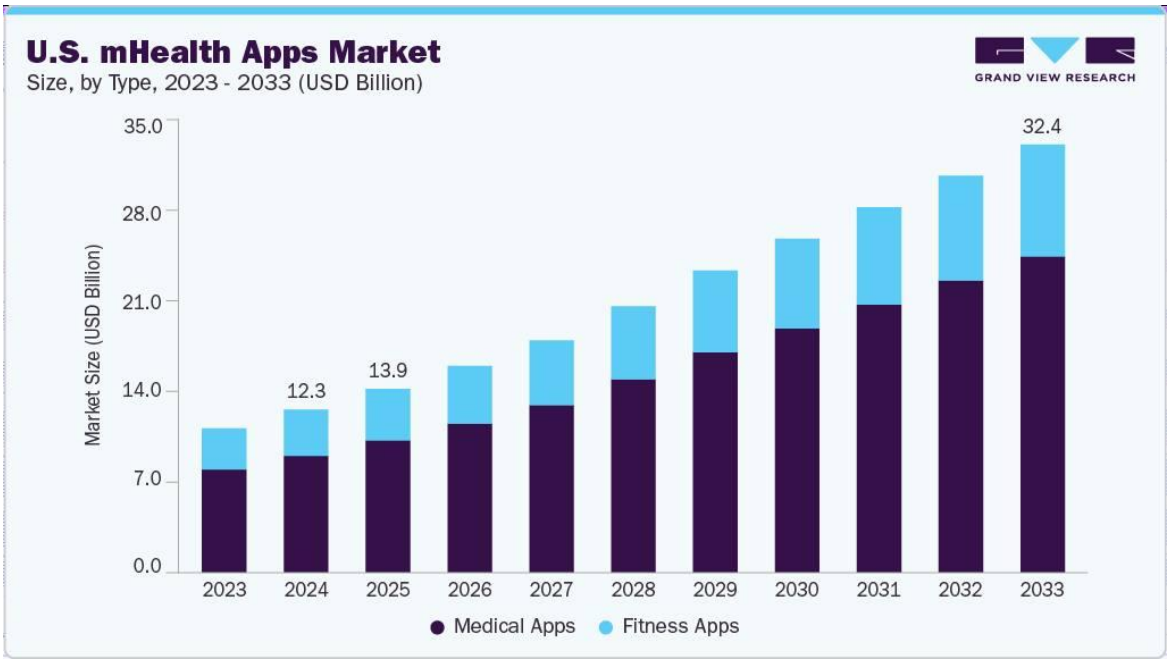


**Figure – 1**

The Figure – 1 shows how the U.S. mHealth apps market was valued at approximately USD 12.33 billion in 2024 and is expected to expand to USD 32.41 billion by 2033, with an estimated compound annual growth rate (CAGR) of 11.16% between 2025 and 2033. This growth is primarily fueled by the increasing use of smartphones, enhanced internet accessibility, and the rising acceptance of mobile health technologies among both healthcare professionals and patients. Additionally, the widespread use of fitness and medical applications for monitoring and managing personal health data through smartphones is a key factor contributing to the market's expansion.

The integration of mobile applications with national healthcare systems makes it possible to generate digital certificates, organize testing and control access to medicines. One of the key areas is the integration of pharmacy systems with state vaccination registries, which makes it possible to generate digital vaccination certificates and facilitates their verification. In addition,

services for PCR testing and the subsequent issuance of digital certificates are being actively introduced. Managed access programs are essential to tightly control the prescription and dispensing of oral antiviral drugs for the treatment of COVID-19 in pre-defined patient populations software as a medical device that is used to monitor and treat various conditions, such as ambulatory blood pressure monitoring or continuous glucose measurement. Mobile solutions also provide continuous professional development for pharmacists and doctors in an online format. Moreover, managed access systems are beginning to be used to provide patients with complex medicines, including anticancer drugs and biologics, which contributes to strict adherence to treatment protocols.

## CONCLUSION

Telepharmacy is a promising area of digital healthcare that can significantly transform pharmaceutical practice. It provides wider access to pharmaceutical services, reduces costs and increases patient satisfaction. The prospects for the development of telepharmacy are associated with the introduction of artificial intelligence, mobile applications and wearable devices, which will increase the individualization of pharmacotherapy and the quality of care.

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