



Review Article

Advancement of the healthcare system and the impact of e-pharmacy on the economy growth

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Abstract

In recent years healthcare system shows significant advancement by changing or modifying several businesses model by driven technological innovation and focus on patient-centered care. Some business have shown downfall at the time of pandemic except to the online market. One of the most transformative developments has been the rise of e-pharmacy, a digital model that allows patients to access medications and health services through online platforms. This review paper explains advancement of healthcare system analysis and presentation of this novel breakthrough in the online, or "E-pharmacy," sector. This article addresses the benefits and downsides of e-pharmacies, the distinctions between online and physical pharmacies, the factors that drove the growth of the Indian e-pharmacy sector, and the many emerging e-pharmacies in the country. The legislative structure that oversees the e-pharmacy sector is also covered in the briefing. Along with this, the reader will learn about the various government programs that have been implemented. More than ever, traditional healthcare models are changing because of the increasing use of digital technology in the field.

Keywords: E-Pharmacy, Internet, Pharmaceutical sector, On demand medication.

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1. Introduction

The Indian pharmaceutical market was estimated to be worth US\$ 41 billion in 2021, ranking third in terms of volume and amount and twelfth in terms of value. It is expected to grow to US\$ 65 billion by 2024 because of factors like an aging population, an increase in chronic illnesses, a rise in disposable income, and more awareness. This estimated amount offers India a competitive advantage as a creation target because it is almost 33% of the US and nearly a significant percentage of Europe.¹ Drug stores are progressively making a bigger presence in the online business sector thanks to their astonishingly fast rate of penetration. There are already 250 or so online pharmacies operating across the country. Over the course of the previous several decades, consumers have changed the way they make purchases of goods and services. Essentially, the internet has taken over the market, with many customers regularly ordering prescription drugs online. In contrast to typical chain pharmacies, online pharmacies offer certain advantages but also pose certain hazards to patient safety when purchasing

medications. E-commerce for the retail and wholesale markets is constantly expanding. E-commerce businesses have noticed a 20–30% increase in orders when clients place orders online.² In 2008, there were 2986 online pharmacies in operation worldwide. Since there were 65 online pharmacy startups in India in 2005, we need to rethink the way we handle pharmacy, particularly regarding the Internet, which greatly enhances the value of healthcare services by making them more accessible, even to the most remote parts of the nation. An increasing number of people are now depending on digital devices and the internet to receive medical services and treatments, as evidenced by the recent COVID-19 epidemic. While numerous new gadgets promise to completely change many facets of patient care; the development of disruptive digital health technologies has indeed reached a pinnacle.³

A patient's journey from symptom detection to treatment and ongoing support might be streamlined with the use of contemporary technologies, as healthcare systems are

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gradually realizing. The aforementioned paradigm shift possesses the capacity to expand healthcare accessibility, curtail expenses, and furnish customized treatments.

As per a survey, the e-pharmacy market in North America and Europe was valued at approximately US\$ 29.3 billion in 2014. It is projected to expand at a compound annual growth rate (CAGR) of 17.7% to reach a valuation of US\$ 128 billion by 2023 (FICCI, 2016). Although e-pharmacy is still in its infancy and has several implications, it could grow to be a very significant industry area in the future.²

1.1 E-Pharmacy

While the handwritten prescription method was once a profitable way to distribute medicine, the rise of e-commerce has caused the market for medicine distribution to shift. As a result, medicine is now also distributed online using electronic prescriptions, a practice known as e-pharmacy, which is also referred to as online, Internet, cyber, or tele pharmacy. It is anticipated that the e-pharmacy model may impact pharma sales in India by roughly 5–15%, if it is primarily focused on providing underserved populations with access to medications.⁴ It enhances consumer accessibility and convenience. Patients with chronic illnesses in their nuclear families and those unable to venture outside to find a pharmacy both greatly benefit from it. pharmacy is an online pharmacy that accepts orders and ships them to clients via postal service, courier, or web portal. The worldwide e-pharmacy market was estimated to be worth USD 42.32 billion in 2018; by 2025, it is projected to grow to be worth USD 107.53 billion, with a compound annual growth rate (CAGR) of roughly 14.26% (Globe news wire 2019). Pharmeasy Medlife, 1MG, Netmeds Myra, CareOnGo, and Pharmasafe are a few of the major online players in e-pharmacy. With almost 30% of the Indian e-pharmacy business, Medlife is in the forefront.⁵ Different type of business model shown in **Figure 1**.⁵

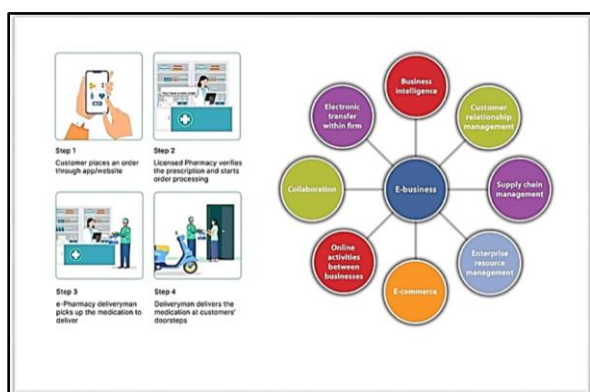


Figure 1: E. Pharmacy business model

1.2 Kinds of online pharmacies

Online pharmacy is now growing day by day so here in table 1 summarize different type of online pharmacy.

Table 1: Different type of online pharmacy^{6,3}

S. No	Type of Online Pharmacy	Description
1	Licensed Online Pharmacies	It is generally regulated by government bodies, require a prescription for prescription medications, and follow safety protocols for medication dispensing.
2	Mail-Order Pharmacies	Allow customers to order prescriptions and over-the-counter medications online and have them delivered via mail. Often used for long-term refills.
3	Discount and Generic Pharmacies	Focus on discounted and generic medications, may or may not require prescriptions, often part of drug discount programs.
4	Specialty Pharmacies	Deal with specialized medications for chronic or complex conditions like cancer, HIV/AIDS, or rare diseases.
5	Telehealth Pharmacy Services	Linked with telemedicine services, allowing virtual consultations with healthcare providers to get prescriptions.
6	Compounding Pharmacies	Create custom medications tailored to individual needs, such as altering dosage or combining ingredients. Often for patients with unique medical needs.
7	Over the Counter (OTC) Pharmacies	Focus on non-prescription medications and wellness items like vitamins, supplements, and personal care products.

1.4 Benefits

1. Saving money
2. Time savings
3. Enhanced consumer convenience
4. More medications are available.
5. Simple access to medication
6. Access available around-the-clock
7. Refund policy
8. It is simple to compare the prices of medications.
9. More precise consumer data
10. Privacy
11. It is possible to have medications delivered at the specified location at the appropriate time.
12. Quick distribution
13. More options due to the greater range of medications accessible.
14. Handy for elderly individuals who are unable to leave their homes and for certain patients.⁷

1.5 Drawbacks:^{8,9}

1. The possibility of medication interactions and resistance
2. Encourage taking care of oneself
3. Possibility of drug misuse
4. Concerns about financial privacy
5. Potential for misdiagnosis
6. Possibility of drug abuse
7. Drug quality and purity are not guaranteed
8. Security and privacy issues with electronic health records
9. Dangers connected to buying medications online
10. A big worry is medical privacy
11. Easy access to illicit substances
12. Some online pharmacies sell medications without a prescription, which can have negative effects.

1.6 Obstacle

1. Tactile legislations are required to regulate e-pharmacies in India.
2. To sell narcotics to children
3. Due to their ignorance of the internet, illiterate people can now access technology-driven models.
4. The internet's speed
5. Problems with prescription drugs
6. The legality of electronic signatures. The legitimacy and dependability of online legal pharmacies.
7. Defence of consumer rights
8. Information shared is secure and confidential. Financial transactions are secure.
9. Government oversight of online pharmacies that are not under Indian law
10. Ambiguous laws pertaining to the interstate transfer of medications.
11. Problem with the import and re-import of drugs.¹⁰

2. The Indian Regulation of E-Pharmacy

The central authority and state governments have overlapping jurisdiction in India. The state governments are in charge of the production, marketing, and distribution of drugs while the federal government handles the import licenses. The two key players for the governance of narcotics are the Central Narcotics Control Organisation and the State Government.¹¹ Under the leadership of the State Drug Controllers are the Drugs Control Administrations (DCA) who answers to the Drugs Controller General of India. Each State has its own Drug Enforcement Agency. The Indian Medical Act of 1956, the Drug and Cosmetics Act of 1940 with its Drug and Cosmetic Rules of 1945, the Pharmacy Act of 1948 and the Information Technology Act of 2000 that amends e-commerce regulations are all classified under acts

that deal with pharmacy regulation. These laws govern pharmacy regulation so that aside from emergencies, these laws dealing with the e-pharmacy model were not always responsive, which permitted significant abuse by these players for their enterprises. We also found that these players were not sufficiently compliant with the rules. Controlling, supervising and tracking the dispensing of pharmaceuticals through e-pharmacies seems relatively impossible, and there seem to be vague laws regarding the online sale of prescription medication.¹²

3. Draft Guidelines for E-Pharmacy

As an effort to control the sale of prescription drugs via online pharmacies, the Union Health Ministry drafted some regulations in an e-Pharmacy portal on August 28, 2018. Only the DCGI has the authority to draft the guidelines. The 1945 Drugs and Cosmetics Rules and the 2000 Information Technology Act are the two bodies that govern the online pharmacy's e-commerce sector.¹³ All internet pharmacies are required to obtain a single state license from every state in order for their base of operations to be able to distribute drugs nationwide. Violation of rules will lead to suspension or cancellation of e-pharmacy registration. Therefore, a portal should comply with The Drug and Cosmetic Act 1940 and IT Act 2000.¹⁴ The shipping of drugs ought to be overseen by a registered pharmacist who has access to the patient's records. The e-Pharmacy portal stores the prescribed medications and relevant patient details. Generally, registration of the e-Pharmacy web portal should be mandatory before any selling, distributing, stocking, or advertising of medicines. The e-Pharmacies are registered with the Central Government after submission of the form 18AA and payment of a Registration Fee of 50,000 to the Central Licensing Authority. Three years would pass after the effective issue date of the registration. The audit, conducted by a CLA-approved team, lasts for two years. A person should renew their registration within six months of the previous registration expiring. Psychotropic and narcotic medications are not covered by e-pharmacies.

The co-founder of Medlife, Prashant Singh, stated, "ePharmacies are highly supported by both the government and the CDSCO." Other than the requirement to abide by the law, there are no regulatory pressures. The HC ruling also exclusively addressed online pharmacies that sell goods but lack the necessary authorization to deliver medicine, making them function unlawfully.^{15,11}

4. A Few Online Pharmacies^{24,29}

Table 2: Some online pharmacy in India

Pharmacy	Description
PharmEasy	This pharmacy deals with clients after online prescriptions over the phone to receive medications, take health tests, and even purchase other health related goods online. People can take advantage of a variety of services, such as free delivery to their homes, obtaining lab tests, and wide-ranging health insurance.
Medlife	Clients can purchase prescription and OTC medicine as well as other health products that need to be delivered to any place within India. They include consultations, as well as laboratory work and other medical help.
1mg	Sells medicines and other health related goods, provides lab tests and other diagnostic services, and gives health advice with home delivery of pills at no cost. Real medicines and medical equipment, professional doctor's consultation over the internet.
Netmeds	Internet pharmacy providing exceptionally quick delivery of a wide assortment of medicines and wellness products. Largest selection of medicines, free delivery, volume purchase discounts.
Apollo Pharmacy	One of the biggest retail chains of pharmacy in India which has launched an online store for medication and healthcare products. Well-known pharmacy with a reliable brand, great pharmacy chain with fast services.
SastaSundar	An online pharmacy with a wide assortment of affordable medicine, health products, and services. Low prices, extensive catalog, free delivery, and other good deals.
CureFit (Cult.fit)	Fitness and wellness platform that specializes in fitness, wellness products, and medicines. Combines fitness with healthcare services, deliver medicines, dietary guidelines.
Medplus	One of the large pharmacy chains in India that focusingsp health and wellness supplements and diagnostic services
HealthKart	focuses on healthcare supplements, wellness, and vitamins, as well as medicine. They put an emphasis on food and fitness supplements.
BigBasket (Pharmacy Section)	Apart from grocery delivery, BigBasket sells medicines and other health-related products on its platform. Sell a lot, deliver fast, and cheap.

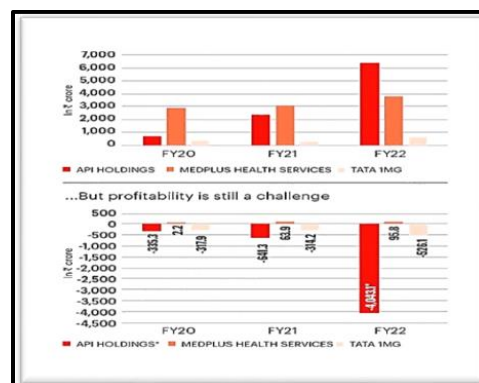
5. The Impact of E-Pharmacy on Economy Growth

E-pharmacies are rapidly transforming the pharmaceutical industry worldwide, fuelled by a growing consumer preference for accessible and convenient healthcare solutions. Their impact is seen across various areas

- Job Creation:** The rise of e-pharmacies has led to significant job growth in diverse fields, including technology development, customer support, logistical operations, and healthcare advisory services.¹⁶
- Revenue Generation:** The online pharmaceutical sector generates billions of dollars annually and is projected for continued expansion, representing a substantial contribution to the economy.
- Expanded Market Reach:** E-pharmacies facilitate direct-to-consumer sales on a global scale, significantly broadening the potential customer base for pharmaceutical companies.
- Price Transparency:** Online platforms enable consumers to easily compare drug prices from multiple vendors, driving competition and often resulting in lower costs.
- Lower Operational Expenses:** By eliminating the need for physical retail locations, e-pharmacies drastically reduce overhead costs associated with rent, staffing, and utilities.
- Economies of Scale:** Bulk purchasing allows e-pharmacies to negotiate better prices with suppliers, translating into savings for the consumer.¹⁷

- Reaching Remote Populations:** Medication delivery to remote areas removes the burden of long-distance travel for patients.
- Enhanced Patient Convenience:** E-pharmacies offer a simple and convenient method for ordering prescriptions, providing greater flexibility for patients with limited mobility or time. Revenue of different E-pharmacy firm FY2020 to 2022 in **Figure 2**.²

E-pharmacy was estimated to have a 63.5-billion-dollar global market in 2021. From 2022 to 2031, a 19.2% annual rate of growth is anticipated. By the end of 2031, it is projected that the worldwide e-pharmacy market will be valued at over US\$362.8 billion.¹⁸

**Figure 2:** Revenue of E-pharmacy firm

6. E- The Impact of Pharmacy on Society

Pharmacies, both traditional and online, are essential to public health, ensuring broad access to medications and medical supplies critical for maintaining a healthy population. Beyond dispensing drugs, pharmacists in both settings empower patients to make informed health decisions by providing education on proper medication use, potential side effects, and necessary lifestyle changes.¹⁹ They also enhance treatment adherence through services like medication synchronization, refill reminders, and personalized counseling, ultimately improving patient outcomes. Moreover, pharmacies support public health initiatives like vaccination campaigns and health screenings, contributing to disease prevention and overall health promotion. Economically, pharmacies generate revenue, create jobs, and bolster the broader healthcare sector, thereby strengthening the fabric of society.²⁰

E-pharmacies have proven invaluable during crises like pandemics, working with healthcare organizations, professionals, and governments to ease public anxieties. Their accessibility and convenience are particularly beneficial when individuals are confined to their homes. Furthermore, e-pharmacies improve access through transparent pricing and integrating medication reminders into healthcare plans. By positioning themselves as comprehensive healthcare solutions, e-pharmacies are becoming increasingly vital to contemporary healthcare.²¹

As one Medlife spokeswoman stated, their core mission is to provide widespread access to comprehensive healthcare solutions from the comfort of people's homes. As the nation's largest e-health company, the COVID-19 pandemic has reinforced this commitment, prompting an expansion of services beyond online medication distribution to include home diagnostics and consultations, deploying phlebotomists to patients' residences to ensure uninterrupted essential testing.²² The growing popularity of e-pharmacies is partly driven by India's high rate of premature mortality from non-communicable diseases (NCDs), which are rapidly increasing due to sedentary lifestyles, increased motorization, automation, and rapid urbanization. Furthermore, access to medicine remains limited in remote areas. By providing readily accessible information about medications through licensed professionals and physicians, e-pharmacies address the challenges consumers face in physically obtaining them. Telemedicine further connects individuals in rural India with experts from major cities and across the globe.²³

E-pharmacy websites also feature health blogs containing detailed information about medications, including dosage instructions, potential side effects, and indications, thereby increasing patient education and awareness by disseminating knowledge about various medical conditions.²⁴

The e-pharmacy model facilitates widespread access to information regarding diseases, treatments, side effects, herbal remedies, and drug interactions, as demonstrated during the COVID-19 pandemic, leveraging the internet to share this knowledge globally.²⁴

7. Government Initiative

Spearheaded by the Indian government, the Digital India program aims to empower the nation by fostering technological literacy and economic awareness. This ambitious initiative ensures citizens can access government services through electronic means. Complementing this digital transformation, the Ministry of Health & Family Welfare is leveraging Information and Communication Technologies (ICT) to enhance the effectiveness of the public healthcare system. Key components of this e-healthcare push include the National Health Portal, e-Hospital @nic, the Online Registration System (ORS), and SUGAM 28, all designed to provide online patient services and increase public awareness of digital healthcare options. Further bolstering public health, the Ayushman Bharat Health Insurance Scheme strives to cultivate a capable, happy, and healthy populace.²⁶ E-pharmacy companies are also contributing by partnering with health insurance providers, enabling clients to purchase medications at reduced costs and increasing the adoption of online pharmacies. In support of the "Make in India" initiative, the Drugs Controller General of India (DCGI) is establishing a single-window facility to streamline commercial transactions.²⁷ Moreover, the Jan Aushadhi Initiative promotes the use of affordable, quality generic medicines by raising public awareness and ensuring their widespread availability through Jan Aushadhi stores. This initiative actively educates the public that high drug costs do not necessarily equate to greater potency or efficacy, and encourages doctors, particularly those in government institutions, to prescribe generic alternatives.^{24,25}

8. Future Trends: E-Pharmacy and the Evolving Healthcare Landscape

The trajectory of e-pharmacies points towards significant future advancements and market expansion. Key areas of development include:

1. **Telemedicine and AI Convergence:** Expect tighter integration between e-pharmacies and telemedicine platforms, creating streamlined patient experiences encompassing consultations, prescriptions, and medication delivery. Artificial intelligence (AI) is poised to transform e-pharmacy operations through predictive analytics, personalized medication recommendations, and automated processes.²⁷
2. **Expanding Service Portfolios:** E-pharmacies are anticipated to broaden their service offerings to include areas like mental health support, wellness products,

chronic disease management programs, and even in-home healthcare services.

- Emerging Market Growth:** The increasing need for accessible healthcare in emerging economies, particularly in nations like India, Brazil, and China, will fuel the growth of e-pharmacies. These regions have substantial populations that are progressively embracing online platforms for both retail and healthcare solutions.^{28,29}

9. Conclusion

Healthcare systems improving and e-pharmacies growing are closely connected. As healthcare changes, e-pharmacies are set to become more important in how medicine gets distributed. They can make it easier for people to access healthcare, lower costs, and create jobs, which can help the economy grow. However, for e-pharmacies to reach their full potential, issues such as regulation, security, and fake drugs need to be tackled. Ongoing innovation and regulation are needed to ensure that e-pharmacies help the economy while also improving healthcare worldwide. The aim of e-pharmacies is to help the country grow, providing clear benefits for both the industry and consumers. The new online healthcare model of e-pharmacies is a promising approach that is likely to see high demand in the future.³⁰ A recent analysis by EY predicts that the e-pharmacy market could reach about \$360 million in the next four years. E-pharmacies are often more effective and reliable than local drugstores in rural areas, delivering affordable medications right to the customer's home with just one click, while also providing information on medical treatments. A survey found that 76% of respondents believe e-pharmacies are more convenient than traditional payment methods. It is expected that e-pharmacies can reach 85% of the chronic medication market and 40% of the acute market, thus boosting e-commerce. Thanks to its high growth potential and returns, the e-pharmacy market in India is seeing tremendous expansion from players in the corporate, venture capital, and private equity (PE) spaces, in addition to assisting consumers. Based on estimates of around \$2.7 billion in 2021, Research and Markets projects that the e-pharmacy market in India would expand at an annualized rate of 63% between 2020 and 2025.³¹

10. Source of Funding

None.

11. Conflict of Interest

None.

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