



REVOLUTIONIZING HEALTHCARE: THE RISE OF E-PHARMACIES

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ABSTRACT

The healthcare sector is undergoing a significant transformation with the rapid emergence and growth of e-pharmacies. These digital platforms have revolutionized the way consumers access medications, offering a convenient, cost-effective, and time-saving alternative to traditional brick-and-mortar pharmacies. This article explores the evolution, benefits, and challenges associated with e-pharmacies, and their potential to reshape global healthcare delivery. With the increasing penetration of internet services and smartphone usage, e-pharmacies are becoming an essential part of modern healthcare ecosystems, particularly in urban and semi-urban regions. They facilitate easy access to a wide range of prescription and over-the-counter medicines, often with added services such as online consultations, home delivery, digital prescriptions, and automated refill reminders. Additionally, e-pharmacies contribute to better patient compliance, improved transparency, and efficient medicine management. However, the rise of e-pharmacies also presents challenges such as regulatory compliance, data privacy concerns, risks of counterfeit drugs, and the need for robust digital infrastructure. The article critically examines the regulatory frameworks across different countries and highlights the need for harmonized policies that balance innovation with safety and accountability. Moreover, it discusses the role of e-pharmacies during public health crises like the COVID-19 pandemic, where they played a pivotal role in ensuring uninterrupted access to essential medications. As the healthcare industry embraces digital transformation, e-pharmacies are poised to become integral to future healthcare delivery systems, driving accessibility, affordability, and efficiency. The article concludes by emphasizing the importance of integrating e-pharmacies with broader healthcare reforms to ensure sustainable and equitable healthcare for all.

KEYWORDS: E-Pharmacies, Digital Healthcare, Medication Access, Healthcare Innovation, Telemedicine Integration.

INTRODUCTION

In recent years, the global healthcare landscape has witnessed a paradigm shift driven by digital innovation and evolving consumer expectations. Among the most transformative developments is the advent of e-pharmacies—online platforms that enable the purchase and delivery of pharmaceutical products through digital means. E-pharmacies have emerged as a critical component of modern healthcare, offering enhanced accessibility, affordability, and convenience to patients. With the increasing adoption of smartphones, internet connectivity, and e-commerce practices, traditional barriers to medicine access are being dismantled, especially in remote or underserved areas.

The COVID-19 pandemic further accelerated the demand for digital healthcare services, spotlighting the crucial role of e-pharmacies in ensuring uninterrupted access to medications amid lockdowns and mobility

restrictions. Beyond convenience, these platforms also offer value-added services such as e-prescriptions, online consultations, automated refills, and personalized health tracking, aligning with the broader movement toward patient-centric care.

However, the rise of e-pharmacies is not without challenges. Issues related to regulatory compliance, data privacy, counterfeit drugs, and quality assurance continue to raise concerns among healthcare professionals and policymakers. As the e-pharmacy sector expands, there is an urgent need for robust regulatory frameworks and technological safeguards to ensure safe and ethical practices.

By leveraging the power of the internet, e-pharmacies have streamlined the process of medication procurement, making it easier for people to manage their health. This digital revolution has brought about numerous benefits,

including increased accessibility, convenience, and cost-effectiveness. In this article, we will delve deeper into the world of e-pharmacies, exploring their advantages, challenges, and the future of this rapidly growing industry.

This article delves into the emergence, growth, and impact of e-pharmacies, analysing both their transformative potential and the hurdles they must overcome. By examining case studies, current trends, and future prospects, the discussion aims to offer a comprehensive understanding of how e-pharmacies are revolutionizing healthcare delivery worldwide.

1. MEDICINE – IN COMMISSION AND VOCATION

Medicines in the service of the medical treatment to patients are the adhesive substance that binds firmly the humane affection between the doctors and the patients apart from the society and medical profession. Medicines are the life giving and life protecting substances forming part of medical service and medical profession.

The global revolution of Information Technology is studded with many stars, one prominent and promisingly progressive refulgence being E-Pharmacy. The hegemony of pharmaceutical industry in health care received substantial philip through on-line trading of medicines and drugs. Internationally reputed drug manufacturers like Pfizer, Hoffmann-La Roche, Johnson & Johnson forecast huge growth of bio-pharma market in the next few years, by presumably 2025.^[1]

Glaxosmithkline and Novartis Ag too optimistically expect that the global drug delivery technology could reach from 508630 of 2019 to USD 589190 million by 2025.^[2] The global Pharma & Cosmetics market is valued at 1509500 million US\$ in 2017 and will reach 1952700 million US\$ by the end of 2025, growing at a CAGR of 3.3% during 2018-2025.^[3]

It is further stated in the Report Hive that the world pharmacy & cosmetics production will increase at a growth rate of about 2.38%. With the development of economy, the world of pharmacy & cosmetics capacity will continue to expand in the future and the main consumption region will be in NA and EU, apart from Asian countries.^[4]

The growth of the e-pharmacy market is attributed to a rise in the number of internet consumers, increased access to web-based and online services, and rising implementation of e-prescriptions in hospitals and other healthcare services.^[5]

Every invention or discovery is associated with patent or latent risks. Governments are often struck with consternation as to the efficacy and safety of drugs and hence impelled to design and develop meaningful

regulatory measures and state agencies to oversee development and marketing of drug products and medical devices vis-a-vis public interest. The States are obligated to ensure their people accessibility and affordability to medicines and drugs as a matter of right, an offshoot of right to health, an integral part of right to life.

As the use of drugs is likely to be paired with risks or adverse results, “risk-to-benefit ratio” (i.e. the benefit derived from using the drug far outweighs the risk likely to be incurred from its use) is adopted. Despite diligent regulation there may be unfortunate events where drugs cause harm, for example from drug products containing toxic impurities, from drugs with unrecognized severe adverse reactions, from adulterated drug products, and from fake or counterfeit drugs, compelling strict and effective drug regulation in the interest of general public. However, there is no common or universal method of regulations with regard to pharmacy-services, and drug regulations vary from country to country.

However, effective regulation of drugs requires a variety of functions like

- (1) evaluation of safety and efficacy data from animal and clinical trials,
- (2) Licensing and inspection of manufacturing facilities and distribution channels to assure that drugs are not contaminated,
- (3) Monitoring of adverse drug reactions for investigational and marketed drugs, and
- (4) Quality control of drug promotion and advertising to assure that safety and efficacy claims are accurate.

Pharmaceutical regulations, or medicines regulations encompass legal, administrative, and technical measures that governments take to ensure the safety, efficacy, and quality of medicines, as well as the relevance and accuracy of product information.^[6] In some countries, one single agency regulate the functions of drug administration and in some countries with federal system of government, the regulation is shared by Provincial and Federal agencies.^[7] In the context of pharmaceutical care, policy-makers repeatedly face the challenge of balancing patient access to effective medicines with affordability and rising costs.^[8]

As expected, Indian participation in global trade inventions and investments exhibited a leading role and resultantly the total addressable medicine market for e-pharmacies in India is likely to reach USD 18.1 billion by 2023, driven by increasing internet penetration through smart phones, healthcare spend and rise in chronic diseases, according to a report.^[9]

Fair market estimates indicate that every year nearly 35 percent of the domestic pharmacy market relates to chronic medications and the remaining 65 percent to acute medicines.

The pharmaceutical industry discovers, develops, produces, and markets drugs or pharmaceutical drugs for use as medications to be administered (or self-administered) to patients, with the aim to cure them, vaccinate them, or alleviate the symptoms.^[10]

The core mission of the pharmaceutical industry is to manufacture products for patients to cure them, vaccinate them, or alleviate a symptom, often by manufacturing a liquid injectable or an oral solid, among other therapies.

Pharmaceutical industry has evolved from the ancient traditional medicinal preparations made from plants, animals, or minerals exemplified through Chinese, Hindu, and Mediterranean civilizations to modern techniques of isolation and purification of compounds, chemical synthesis, and computer-aided drug design of 19th and 20th centuries. The marvellous researches in the fields of chemistry, physiology and microbiology engendered new drug discovery processes, inventions and discovery, development and manufacture of medicines with the active participation of public and private entities.^[11]

The concept of “Pharmacy” emerged in the 17th century with the authorization of King James-I mandating the separation of apothecaries (pharmacists) from grocers and declared that only a member of the society of apothecaries should keep the apothecary’s shop, make or sell pharmaceutical preparations. Thus regulation of drugs and medicines, drug marketing and

quality control laboratories became the part of pharmaceutical activities. However, such regulations varied from one country to another, for example, whereas some countries exempted herbal and homeopathic products from regulation, in some countries there is little regulation imposed on drug importation. But events of drug related catastrophe resulted in persistent public demand for strict legislative and penal regulation and imposition of severe punishments to protect public life. The episode of thalidomide prescription to pregnant women for treating morning sickness occurred in 1960 was later proved to be the cause for Phocomelia (birth defects) that appeared in epidemic proportions, and the same was proscribed. However, in cases of expeditious approvals for drugs to be administered to cure Cancer and AIDS, rapid regulation measures paved way for marketing of drugs with more toxicity than the public requirement. Thus, drug regulations can and probably will remain in a state of flux, becoming more lax when the public perceives need for new drugs and more particularly following a drug catastrophe.^[12]

Admittedly, throughout the globe, pharmaceutical regulations play an important role to ensure safety and efficacy of the approved drugs, their quality and pricing. To sustain the health status it becomes imperative to regulate both domestic and imported products. Every sovereign state is empowered to enact its own regulatory measures applicable to innovation, manufacturing, drug testing and marketing strategies to cater to the needs of the patient population of the country.



[13]

THE PHARMACEUTICAL MARKET IN 2023: In 2023, 55 new molecular entities were approved by the FDA, the second-highest count in the past 30 years. This cohort was nearly double what it was in 2022, which is likely to be because of issues such as workflow disruptions and bandwidth problems caused by the global Covid-19 pandemic have improved. Several drug patents expired in 2023, including AbbVie's Humira and Johnson & Johnson's Stelara. Looking ahead to 2024 and beyond, the pharma industry is set to face further shake-ups in the coming years with many more blockbuster drugs from Bristol Myers Squibb, Novartis and other companies are set to face their first generic or biosimilar competitors in the largest global pharma market, the US. As always, the patent expirations should create quite a disturbance for many of the top players.

Mergers and acquisitions (M&A) are also gradually changing the marketplace and some of the largest drugmakers have been strengthened through joining forces with or being bought out by other businesses. According to GlobalData's Deals Database, in the global pharmaceutical industry, there were 430 M&A deals announced at the start of 2024 worth a total value of \$68.8bn. There are not expected to be any megadeals that combine large conglomerates this year, but large pharma companies will likely continue to pursue with acquiring or partnering with biotechs to offset losses from patent expires.^[14]

The global pharmaceutical industry which rose to astounding \$1.6 trillion, targets to touch \$1.72 trillion keeping in view of the spiralling demand to develop drugs to cater to the global needs of sick population, and the pharmaceutical companies continue to work tirelessly to bring the most innovative and cutting-edge treatments to patients.^[15]

2. E-PHARMACY – A NEW PROJECTILE OF PHARMACEUTICAL INDUSTRY

Pharma is a material or substance used to prevent and treat disease, reduce pain, improve health, or enhance the body's resistance to disease or to help diagnose diseases. Basing on its source, it may be natural medicine or synthetic medicine.^[16]

An online pharmacy is an internet-based vendor that sells medicines and includes both legitimate and illegitimate pharmacies. On-line pharmacies are independent and include online branches of conventional local pharmacies representing partnership among pharmacies.^[17]

E-pharmacy denotes the buying and selling of medicines and other pharmaceutical items with the support of web portal or any electronic mode.

E-Pharmacies are rapidly thriving pharmaceutical entrepreneurial entities, based on on-line platforms facilitating consumers to procure medicines needed without straining to visit traditional brick-and-mortar

pharmacies. The vendor and vendee functionality is accomplished through virtual space thus saving time and space and concomitantly contributing to the growth of pharmaceutical industry. E-Pharmacy now stands as the nucleus of pharmaceutical industry designed to conform to the prime ideals and objectives of medical profession and public service. Being the offspring of pharmaceutical family, E-pharmacy depicts the traits of production perspectives, entrepreneurial ethics, standards of commercial propriety and integrity and legal submission.

E-pharmacy prunes distributors in the long chain of drug supply system and economise costs and time, and facilitates end-user with medicines at a lesser price. The modern large size corporate through mergers, new product launches, acquisitions and partnerships resorted to implementation of lucrative strategic initiatives contributing to the market strength, and resultantly many major players like CVS Health have come into competitive landscape.^[18]

The E-pharmacy being an off-shoot of modern technology offer benefits of internet like convenience and door delivery of drugs of low cost etc.

E-Pharmacy is no doubt a prosperous and evolving pharmaceutical business, but at the same time it is found to be dissolving some of the faithful operatives from the pharmaceutical hub, and perceived to be a sign of destructive development in health care. E-pharmacies may be seen as a natural mix of benefits and blasts. A cursory glance at the merits and demerits of the E-pharmacies indicate the following.

Advantages

1. **Accessibility** – All patient-consumers may not be blessed with existence of retail pharmacies at arm's reach and often inconvenienced to travel long distances to procure the medicines required. But the facility of on-line pharmacy, generally warehouse of larger inventory and numerous kinds of medicines would cater to the needs of consumers even scattered over distance.
2. **Cost Economy:** cost of medicines through on-line supply would considerably be cheap compared to the price tag of local pharmacist on account of factors like elimination of middlemen (stockists and distributors), transparency in pricing, lower operating and procurement costs etc.
3. **Benefit for rural and remote areas:** Remote and rural areas generally handicapped of the pharmaceutical services will be immensely benefited by securing medicines and information etc. through E-Pharmacies.
4. **Supply chain round the clock:** E-pharmacy operates round the clock facilitating placing and obtaining medicines at any time by a click of button.
5. **Comparative pricing:** Generally local retailers sell the medicines at MRP (Maximum Retail Price)

whereas due to competition among multiple drug manufacturers, e-pharmacy offers medicines at lower price. E-pharmacy model reduces working capital, overhead costs, and trade margins to the pharmacists. This finally translates into a cost advantage to consumers.

- 6. Convenience and Patient awareness:** E-pharmacy enables consumers to order medicines in a convenient manner, from their mobile or computer. E-pharmacies have the technology infrastructure to provide value added information to consumers, such as drug interactions, side effects, medicine reminders, and information on cheaper substitutes^[19]

Obligations of E-Pharmacies

Every E-Pharmacy is to be registered compulsorily and then listed on its website facilitating consumers and stake-holders for status verification. However even the registered holder is precluded from dealing with the following items.

- drugs that are covered under the Narcotic and Psychotropic categories as per the Narcotic Drugs and Psychotropic Substances Act, 1985 (61 of 1985), and
 - Tranquilizers and the drugs as specified in the Schedule X of Drugs and Cosmetics Rules, 1945.
- a) Confidentiality of patients: E-pharmacies shall take all possible steps to maintain the confidentiality of the patient details. But in the interest of public health, the online pharmacies shall disclose to the Central or State Governments such details as required by the law. In this connection, the provisions of the Information Technology Act, 2000 and Data Protection Act. 2018.
- b) Bar on advertisements: E-pharmacies are barred from advertising any drug on radio, television, internet or print media for any purpose.

It is imperative to keep a check on illegal pharmacies online. In the USA, the National Association of Pharmacy Boards (NABP) has developed the Verified Internet Pharmacy Practice Sites (VIPPS) program to gain consumer confidence and make a clearer distinction between legal and illegal sites.

UNREGULATED E-PHARMACIES

It is to be noted that black-sheep prevail everywhere. There may crop up some unregistered and illegal on-line pharmacies operating to the detriment of public good and health. These un-regulated pharmacies are prone to fraudulent transactions and activities and may supply medicines to innocent and gullible patients on prescriptions from unauthorised quacks or fake doctors. Some unchecked e-pharmacists may supply medicines on old and fake prescriptions without proper verification of rules or standards or law. Such acts violative of the Code of Pharmaceutical Ethics are reprehensible and liable for action. The Medical Council of India through its Code of Medical Ethics mandates physicians to display the registration number accorded to them on the

medical prescription but very few physicians actually follow the rule.^[20]

E-PRESCRIPTION

E-Prescription, an electronic prescriptive technology, facilitates health care professionals to send paperless prescriptions, replacing traditional handwritten prescription, and enables patients' easy access to medicines. U.K. is contemplating to replace paper prescriptions by electronic modes. Therefore, due to the increasing implementation of e-prescriptions, uploading the prescription online has become easy and less time-consuming.

The United States of America having larger number of internet users shares the largest part of E-pharmacy market, particularly the North America. The Food and Drug Administration of America is spreading awareness among people, about the expediency of E-prescriptions guiding them not to fall prey to unbranded and harmful drugs.^[21]

Some of the advantages of E-prescriptions.

1. Legibility of the contents.

Often, the illegible handwriting of the medical professional present difficulties in reading the handwritten content, particularly in respect of a scan copy or photocopy of the paper prescription, and this problem is overcome in E-prescription. In view of illegibility of hand-written prescription, there is danger of dispensing the wrong drugs to patients paving way for serious consequences.

2. Expedient delivery of drugs: E-prescriptions enable quick delivery of products and without damage, particularly in places of extreme weather conditions. Delivery of wrong drugs and counterfeit drugs could be prevented.

3. Abuse of drugs: The possibility of abuse or misuse of drugs like pain killers and antibiotics could be checked through proper verification of the authenticity of doctors.^[22]

It is interesting to note that one On-line pharmacy Ro is piloting a program to offer online customers generic prescriptions for \$5 per month without insurance. The company started out with a focus on men's health, initially with prescription erectile dysfunction and hair loss medication.^[23]

3. INFERENCES OF LEGAL AND PROFESSIONAL VALUES.

Medicos (including paramedical) and pharmacists share the consanguinity of medical family with all obligations and duties. A deviant pharmacist is a rotten egg in the basket and fouls the fraternity of medical profession. An earnest and evangelic camaraderie is the essence of medical service. The spiritual sense of service in the Hippocratic Oath permeates even in the solemn affirmation of pharmacists. Look at the oath of the Pharmacist.

PHARMACISTS' OATH: "I promise to do all I can to protect and improve the physical and moral well-being of society, heralding the health and safety of my community above other considerations. I shall uphold the laws and standards governing my profession avoiding all forms of misrepresentation, and I shall safeguard the distribution of medical and potent substances.

Knowledge gained about patients: I shall hold in confidence and never divulge unless compelled to do so by the Law.

I shall strive to perfect and enlarge my knowledge the better to contribute to the advancement of pharmac and the public health.

I furthermore promise to maintain my honour and credit in all transactions and by my conduct never to bring discredit to myself or my profession nor do anything to diminish the trust reposed in my professional brethren.

May I prosper and live long in favour as I keep and hold to this my Oath but should I violate these Sacred promises may the reverse be my lot.^[24]

No doubt, the lofty ideals of our ancient medical profession with service and sacrifice are superb finding place in the spirit and strength of Hippocratic Oath taken by doctors before entering into the medical profession. The same spirit is reinforced by Charaka, ancient Indian Philosopher Physician and Pharmacist, which is fondly cherished by all Pharmacists of the modern days.

The traits of Indian Pharmacy market and the debates surrounding them would certainly invoke a popular Chinese proverb that 'It is easy to get a thousand prescriptions, but hard to get one single remedy'.

With the advent of technological and I.T. revolution, E-Commerce propitiated the emergence of E-Pharmacies or On-line pharmacies. The E-Pharmacies as a new projectile of pharmaceutical industry brought with it the mixed potion of elixir and poison. No doubt, online pharmacies have been penetrating into the deep corners of state to serve the tools of medical service and catering to the needs of people of all terrain with regard to the drugs and medicines. But the online service is also found to be tainted and polluted by the supply of fake and expired medicines, contaminated and unapproved drugs pejorative to the health of sick patients. Surprisingly, the provisions of the Drugs and Cosmetics Act, 1940 does not distinguish between the online and off-line pharmacies leading to unregulated activities of the online pharmacies harming the interests of the patients community. An integral component of professionalism has to do with moral development.^[25]

There is no shortage of ethical dilemmas facing pharmacists daily. Nevertheless, pharmacists have to encounter a variety of issues pertaining to prescriptions

to be filled and dispensed with under their watchful eyes. If necessary, the pharmacists are required to call physician's office for permission to refill a prescription that has no more refills or checking on a dosage to make sure it reflects what the doctor meant to write.

The International Pharmaceutical Federation (FIP) Council approved a code of ethics for pharmacists. While the FIP admits that the role of the pharmacist is continuing to change, it suggests that "a profession is distinguished by the willingness of individual practitioners to comply with ethical and professional standards, which exceed minimum legal requirements."^[26]

Pharmacists are professionals, expected to be very knowledgeable on drugs and to give even drug consultations to the public in an ethical manner. Drug consultation is needed to advise patients on drug selection, drug dosage, understanding drug effects and side effects and interaction of drugs with other drugs or with food. Pharmacist and patient owe mutual responsibility with regard to the interests of the nature of health problem and the suitable medicines for it and the patient should assist the pharmacist in their decision making.^[27]

Pharmacists should always be prepared for product safety alerts, where products can be in a situation of not conforming to the safety specifications. When there is a risk of significant hazard to consumers from a product which has been distributed in the market, pharmacists should take the responsibility of disseminating the safety alert through mass communication media available, including newspapers, radio and television.^[28]

A pharmacist being a member of the joint family of medical profession is also subjected to the same spirit and professional obligations, of course designed for the segment of pharmacy. Ethical and moral decisions are never easy, particularly for healthcare professionals whose actions sometimes influence life and death outcomes. While personal moral and ethical standards should never be ignored, pharmacists need to remember that as difficult as it may be, they should never stand in the way of offering what is in the best interests of their patients' health.^[29]

The trade integrity and the pharmaceutical morality should never be compromised and the pharmacies, both online and offline, are duty bound to exhibit social responsibility and sharing the obligation of the State to protect the right to health of citizens which is an integral part of the right to life of individual citizens, public health and safety.

4. STEAM AND STRENGTH OF INDIAN E-PHARMACY

E-pharmacies are recent entrants in the Indian e-commerce industry landscape, with it receiving increased

attention from government and investors in the last three to five years. Today, the E-pharmacy market potential is worth over a Billion dollar with more than 30 start-ups assisting the growth of this segment in various regions of India.

India currently has over 850,000 independent pharmacy retail stores that are able to meet only 60% of the total domestic therapeutic demand. These traditional Brick and Mortar Retail pharmacies are currently responsible for 99% of the pharmaceutical sales annually with online pharmacy contributing to only 1% of the total therapeutic sales.^[30]

India is a potential place for healthy development and also a ground for sick population countering diseases like diabetes, hypertension, asthma and obesity eventually leading to demand for therapeutics. Further, government initiatives and programmes such as the digital India, Jan Aushadhi programmes for promotion of generic medicines, telemedicine and E - healthcare initiatives to provide quality healthcare and medications to rural parts of India (Where more than 60% of the Indian population Resides) are key parameters that make the e- pharmacy segment, a burgeoning market of the future. The pharmacy market in India is estimated to grow at a CAGR of 63% to touch US \$ 3,657 million (Rs. 25,000/- crores) by 2022^[31], and may cross the U.S. 3 Billion mark by 2024.^[32]

The pharmaceutical activities in India encompassing manufacturing, storing, transportation, distribution and dispensation of drugs and medicines are kept under the vigilance and control of, primarily, the following statutes.

The drugs and cosmetic act, 1940;

Indian Medical Council Act, 1956;

The Pharmacy Act, 1948; and

The Narcotic Drugs and Psychotropic Substances Act, 1985.

India does not have any special or specific legal regime which governs E-pharmacy and the regime governing the conventional model of pharmacy business (i.e. through offline sale) is applicable to E-pharmacy as well. This has also been clarified by the Office of Drugs Controller General (India) through its notification dated 30 December 2015 ("Notification").^[6] The Notification categorically mentions that the Drugs and Cosmetics Act, 1940 ("DCA") does not distinguish between the conventional and over the internet sale/ distribution of drugs and accordingly the provisions of Drugs and Cosmetics Act, 1940 ("DCA") must be complied by E-pharmacy companies as well.

The Ministry of Health and Family Welfare, vide its notification G.S.R. 817 (E) dated 28th August 2018, released the draft rules defining the *sale of drugs by E-pharmacies* as amendments to the Drugs and Cosmetics Rules, 1945 ("Rules"). The government plans to

introduce the new rules in the first 100 days of its second term.

Apart from the licensed pharmacists, the Registered Medical Practitioners (RMPs) are also authorised to prescribe and dispense medicines to the patients at their clinics which may represent a significant potential conflict of interest with the medical ethical principles, namely autonomy, beneficence, and non-maleficance and it raises various ethical and legal challenges. According to the World Health Organization, "Dispensing" as a process of preparing and giving medicine to a named person on the basis of a prescription from a registered practitioner. Medication dispensing is the in-office preparation and delivery of prescription drugs to patients in physician practices and other clinical settings.^[33]

A recent trend noted in metropolitan cities is that many RMPs are doing home visits to treat patients, especially in disabled and geriatric services, a practice prevalent in the communities where there were no pharmacists.^[34]

This practice of dispensing of medicine by RMPs was allowed so that consultation, prescription, treatment-related materials, and medicines are available inside the clinic so that a patient does not have to run to the pharmacy to get medicines that have been prescribed.^[35]

The concept of online pharmacies and online sale of medicines has been in vogue worldwide for more than two decades. An estimated 2986 online pharmacies were operating globally in the year 2008^[36], the numbers of which have risen to 800,000 today. Indian consumers too have begun using these online services in the recent times. Laws for E-commerce are ill-defined and subject to varied interpretations.^[37]

While the government is yet to come up with concrete regulations for the new age e-pharmacies and courts are giving conflicting verdicts in favour and against the running of such pharmacies citing decades-old drug laws, a consolidation phase has begun in the world of mushrooming e-pharmacies in India.^[38]

5. ISSUES AND CHALLENGES FACING E-PHARMACIES

While e-pharmacies offer numerous benefits, they also face a range of challenges that need to be addressed to ensure their sustainable growth and public safety.

1. Regulatory Hurdles: Diverse Regulatory Landscapes: E-pharmacies operate in a complex regulatory environment, with varying laws and regulations across different countries and regions. **Strict Compliance:** Adherence to stringent regulations, such as licensing, prescription validation, and data privacy, can be burdensome. **International Shipping Challenges:** Cross-border shipments of medications are subject to customs regulations, import duties, and potential delays.

2. **Security and Privacy Concerns:** Data Breaches: The risk of data breaches and cyberattacks is a significant concern, as e-pharmacies handle sensitive personal and medical information. Counterfeit Drugs: Ensuring the authenticity and quality of medications sold online is crucial to prevent the distribution of counterfeit drugs.
3. **Consumer Trust and Awareness:** Building Trust: Establishing trust with consumers, especially in emerging markets, can be challenging due to concerns about the legitimacy of online pharmacies. Educating Consumers: Raising awareness about the benefits and risks of e-pharmacies is essential to encourage responsible usage.
4. **Logistical Challenges:** Efficient Delivery: Ensuring timely and accurate delivery of medications, especially in remote areas, can be logistically complex. Inventory Management: Maintaining optimal inventory levels to meet fluctuating demand can be a significant challenge.
5. **Ethical Considerations:** Over-the-Counter Drug Abuse: The easy accessibility of over-the-counter drugs through e-pharmacies raises concerns about potential misuse and addiction. Prescription Drug Abuse: Ensuring that prescription medications are dispensed responsibly and not diverted for illicit purposes is a critical ethical issue.

Way Forward

1. The e-pharmacy sector holds immense potential to address the persisting issue of affordability and accessibility of medicines in India. Steps should be taken to foster the e-pharmacy sector with sufficient safeguards and under stringent regulatory control to protect the interest of the consumers.
2. A stringent licensing mechanism should be adopted for e-pharmacies. A logo and a registration number for e-pharmacies can be generated which would enable the consumer to check the authenticity of the platform. For example: The European Union (EU) has issued a common logo for legally operating e-pharmacies in the EU member states.
3. Information regarding patient should be digitally stored to prevent medicinal abuse and ensure tracking in case there is any adverse event to a medicine.
4. Government health schemes, e-health initiatives for example telemedicine can be linked to e-pharmacies to efficiently cater to a large section of population in rural and sub-urban areas with unmet medical needs.^[39]

CONCLUSION

The emergence of e-pharmacies marks a pivotal shift in the healthcare paradigm, bringing medicine closer to patients through digital convenience, enhanced accessibility, and technological innovation. As medicine continues to function both as a noble vocation and a practical commission, its delivery mechanisms must evolve to meet the needs of a fast-paced, digitally

connected world. E-pharmacies have risen as a dynamic force within the pharmaceutical industry, offering transformative solutions to traditional healthcare barriers while catering to diverse populations.

Yet, with this transformation comes the imperative to uphold the legal, ethical, and professional standards that form the backbone of healthcare integrity. Regulatory clarity, patient safety, and data security must be prioritized to foster trust and sustainability in this rapidly growing sector. The Indian e-pharmacy landscape, in particular, stands as a testament to digital health innovation, demonstrating remarkable potential to become a global leader in accessible and affordable healthcare delivery.

As the healthcare ecosystem continues to digitize, e-pharmacies are no longer optional supplements but essential components of a resilient, inclusive, and patient-centered healthcare framework. With collaborative efforts from policymakers, healthcare professionals, and technology innovators, e-pharmacies can truly revolutionize healthcare for generations to come.

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