



Review Article

Internet Pharmacy: Need to be implemented in India

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Abstract

In this era of science and technology, computer plays an important role in community. Today, computer is so ubiquitous in pharmaceutical research and development. The advent of the internet has had a significant impact on the formation of an information-driven, rapid-paced society. The number of internet users reached 150 million in only five years compared to 13 years for television and 38 years for radio. Consumer expectation for access, convenience, and speed has made the cyberspace superhighway a medium for knowledge exchange and for e-commerce. The internet offers a wide variety of health services and products to healthcare professionals as well as to the public. Online pharmaceutical sales have reached more than nearly \$50 billion. This is a dramatic increase when compared to the \$1.9 billion in 1999. At the click of the mouse, medications can be ordered and delivered conveniently to your door. Internet has evolved into a self-organizing media, capable of multiple interactions within. A large number of consumer products including drugs are being advertised and sold over the Internet. Though the marketing of drugs over the Internet is an inevitable outcome of the booming e-economy, it poses unique ethical, legal and quality challenges- the prime cause being the anarchic structure of the Internet. These challenges are important from the consumer, physician and regulator perspectives. This paper begins with a summary of historical considerations and the shifting organization of internet pharmacy. The advantages and disadvantages of internet pharmacy practice are listed. Internet pharmacy is not only affordable but also can be source of easy availability of medicine.

Keywords: internet pharmacy, cyber pharmacy, virtual pharmacy

INTRODUCTION

Internet Pharmacy is also known as Online Pharmacy, cyber pharmacy, e-pharmacy and virtual pharmacy/drugstores [1]. A pharmacy which operates over the internet is an internet pharmacy. Internet pharmacy has opened a new world by means of providing medical advices to the people. The noble profession of pharmacy is recognized worldwide as a symbol of pestle and a mortar or a tripod with a snake. The main purpose of online pharmacy is to provide medical help to people without having to leave their house and travel to local chemists. If you have a computer with a good internet connection and a credit card, you are only a few clicks away to enjoy the benefits of online pharmacy. These web based pharmacies have online chemist who aid patients to get the proper medicine. Some of the reputed pharmacies on the World Wide Web have both online chemist and doctors to provide live help. Some consumers like to purchase medicine from their own countries to eliminate the shipping and handling costs.

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Internet pharmacy has been the focus of interest since the first major Web site was introduced in the United States. Internet pharmacies sell prescriptions and other products to consumers at the retail level. The Internet pharmacy industry has rapidly strengthened its root in the short time span. Internet chemists provide free advice to patients apart from selling drugs. Most internet pharmacies sell medicines with a doctor's prescription, whereas other does not require a pre-written prescription. If a customer does not have a prescription, he/she is given a questionnaire to fill in. Chemists are specialized in drugs and general surgery but getting prescriptions from them are over the counter prescriptions. This means prescribing medicines without any doctor's advice which is very dangerous and in some cases may cause a tragedy. Though internet chemists are skilled professionals, it is very difficult to judge the real from fake ones. Some uninsured websites may not sell healthcare items without a valid prescription from medical practitioners. On the other hand, many websites have their own physicians to write their own prescriptions on the basis of their patient's symptoms. Beauty experts occupy another part in serving people. Some provide free advice and prescribe products accordingly. Apart from all these, there are also veterinary physicians to look after pet animals. The herbal medicines that some websites sell are equally important though some people claim herbal medicines to be less effective. Herbal medicines use plant

extracts and have no side effects if dosage is monitored properly. The introduction of Soma.com marked the arrival of a major pharmacy presence on internet in January 1999[2]. Many online pharmacy followed soon after, with drugstore.com and PlanetRx.com [3] being the most noticeable. The industries have shifted quickly, with traditional pharmacy chains aggressively acquiring all or part of the Internet starts-ups or establishing their own divisions for online prescription and non prescription sales.



Source: E health Series, BUSINESS INSIGHT 2003

Fig 1 Worldwide expenditure of Healthcare

An Internet pharmacy is a business that may operate totally or partially online. When these businesses are legitimate they do not dispense medications without valid prescriptions, though some of them offer doctor consultations online so people can obtain prescriptions. Offline, the center of these businesses may greatly vary in location. Some are in the US, the UK, and Canada, and others are in Mexico, Australia and Africa. It may not always be easy to find out from where drugs will be shipped.[4] There are many people who use an Internet pharmacy or more than one to fill prescriptions and many of them are quite reputable and safe to use. The best way to find the good ones available is to look to regional accrediting organizations that testify to the safety of the pharmacy. Without this accreditation, use is not risk-free and sometimes people hazard getting the wrong medicines, expired prescriptions or medications they should not have without a proper health screening. As stated, each country or area may have different criteria by which to judge the legitimacy of an Internet pharmacy. Some of the things that normally are considered include that the pharmacy is run by at least one licensed pharmacist, and that medications dispensed are only with prescription. There may also be scrutiny on from where medications are manufactured and drug storage procedures too. The handling of certain medications, like those that are addictive, is also telling when regulating agencies approve online pharmacies. One of the reasons that use of the Internet pharmacy has steadily risen is due to the potential to buy medications at lower prices. This may be of particular importance to those who lack any form of prescription drug coverage. Internet pharmacy can simply be cheaper means to get drugs online than it is to obtain them

from a traditional pharmacy. This doesn't mean prices are dramatically lowered, and some brand name drugs can still be very high priced, but even a small savings could be significant to someone with a limited income. Another reason cited for attractiveness of Internet pharmacies is that they are convenient to use. Though people will have to wait a brief time for a prescription to arrive via the mail, it can be ordered at just about any time without making an extra trip. Many find this ease of use suitable justification for shopping online

ADVANTAGES OF INTERNET PHARMACIES

- Same quality medicines at lower costs.
- Cheaper by at least 40%.
- More convenient purchases.
- Buyers are able to shop for medicine.
- Wider variety of medicines.
- Not limited by traditional pharmacy supplies.

PHARMACY VS INTERNET PHARMACY

Internet pharmacies have been supplying online customers with more efficient alternatives to their prescription drugs. By supplying on the internet, internet pharmacies are able to cater manufacture and supply in bulk; hence cutting the costs of medicines down.[5] Internet pharmacies automate most of their daily processes; hence making it faster for licensed physicians and pharmacists to prescribe medicine.

Traditional pharmacies take longer time on average to prescribe medicine. Traditional pharmacies have higher costs; due to many middlemen involved in distribution of pharmacy drugs before they are bought by customers. Traditional pharmacies involve much inefficiency such as stocking medicines in small quantities; unlike internet pharmacies which manufacture in bulk and store in warehouses. Sometimes, these medicines are stocked for long periods of time (up to 2 years) in traditional pharmacies.

Internet pharmacies cut down the prices of household medicines and make medicine more affordable. On the other hand, traditional pharmacies let customers bear the brunt of medicine costs and for an average medicine user, medicine costs can amount to a few hundred dollars per month. By buying from internet pharmacies, a few hundred dollars can be saved by an average medicine user every month.

PRESENCE OF INTERNET PHARMACY

Many internet pharmacies sell prescription drugs only with a prescription; some do not require a pre-written prescription. In some countries, this is because prescriptions are not required. Some customers order drugs from such pharmacies to avoid the inconvenience of visiting a doctor or to obtain medications which their doctors were unwilling to prescribe. People living in the United States may turn to online phar-

macies because medical care and prescription medications can be prohibitively expensive. Many of these websites employ their own in house physicians to review the medication request and write a prescription accordingly. Some websites offer medications without a prescription or a doctor review. This practice has been criticized as potentially dangerous, especially by those who feel that only doctors can reliably assess contraindications, risk/benefit ratios, and the suitability of a medication for a specific individual.[6] Pharmacies offering medication without a prescription and doctor review or supervision are sometimes fraudulent.



Fig 2 –Sample of internet pharmacy

UNITED STATES

In the United States, there has been a push to legalize importation of medications from Canada and several European countries, in order to reduce consumer costs. Although importation of prescription medication usually violates Food and Drug Administration (FDA) regulations and federal laws, enforcement is generally targeted at international drug suppliers, rather than consumers. Often Americans purchase lower-cost foreign drugs by driving to Canadian or Mexican pharmacies, buying their medications when traveling abroad on vacation, or, buying from foreign pharmacies that ship their orders via mail. To save money, millions of uninsured and underinsured U.S. consumers purchase drugs from online pharmacies in Canada, India, the UK and other countries and receive their purchases by mail. Especially for uninsured Americans taking prescription drugs for chronic health conditions, a major attraction of online pharmacies abroad is that nearly every country, except the U.S., controls its drug prices. Shoppers can easily obtain 50 to 80 percent or more savings at foreign pharmacies, in comparison to US prices.[7] Very rarely are these orders investigated because U.S. authorities are much more worried about controlling illegal pharmacies in the U.S., not consumers themselves. In fact, the *Washington Post* reported that "... millions of Americans have turned to Mexico and other countries in search of bargain drugs...U.S. Customs estimates 10 million U.S. citizens bring in medications at

land borders each year. An additional 2 million packages of pharmaceuticals arrive annually by international mail from Thailand, India, South Africa and other points. Still more packages come from online pharmacies in Canada." [8]

Until about 2005, American consumers looking abroad most commonly turned to Canadian pharmacies for affordable medications.[citation needed] Today, many consumers head to online pharmacies in India, South Africa and other countries where drug prices are often lower than in Canada. Most US consumers and some legislators favor accessing foreign-made prescription drugs to lower Americans' health costs. According to a Wall Street Journal/Harris Online poll in 2006, 80 percent of Americans favor importing drugs from Canada and other countries. [9] President Obama's budget supports a plan to allow people to buy cheaper drugs from other countries.[10] A report in the journal *Clinical Therapeutics* found that U.S. consumers face a risk of getting counterfeit drugs because of the rising Internet sales of drugs, projected to reach \$75 billion by 2010.[11]

UNITED KINGDOM

In the UK, more than 2m people buy drugs regularly over the internet from legitimate online pharmacies.[12] In 2008, the RPSGB introduced a green cross to identify accredited online pharmacies.[13]

The first internet pharmacy in the UK was Pharmacy2U which started operating in November 1999 after backing from the British Government.[14]

INTERNATIONAL CONSUMERS INCLUDING INDIA

International consumers often purchase drugs online from online pharmacies in their own countries, or those located in other nations such as India, Pakistan and the Philippines. Some of these pharmacies require prescriptions, while others do not. Of those which do not require prescriptions, some do ask the customer to fill in a health questionnaire with their order. Drugs available online are often produced by well-known manufacturers such as Pfizer, Wyeth, Roche, and generic Indian drugmakers Cipla and Ranbaxy and Teva Pharmaceutical Industries of Israel. It is a fairly common practice for North American and European visitors to countries like Thailand, India and South Africa to purchase and bring home affordable medications for themselves, family members and/or friends Savings can be significant, often exceeding 80 percent compared to the same medications available in their home countries. Travellers may avoid possible difficulties inherent to physically going through customs with their medication purchases by mailing the drugs to their home so they receive them upon their return.

CLASSIFICATION OF INTERNET PHARMACY

Online pharmacies fall into 3 major categories:

- Independent Internet-only sites,

- b) Online branches of "brick-and-mortar" pharmacies, and
- c) Sites representing partnership among neighborhood pharmacies.[15]

TYPES OF INTERNET PHARMACIES

Three types of Internet pharmacies that sell drugs directly to consumers have [16] emerged:

1. Ones operating like traditional drug stores and Mailorder pharmacies that dispense drugs only after receiving prescriptions from consumers or their physicians.

2. Ones that provide consumers medication without a physical examination by a physician. In place of the traditional face to face physician/ patient consultation, the consumer fills out an online questionnaire that is reportedly evaluated by a physician affiliated with the pharmacy.

3. Ones that dispense medication without a prescription. The first type receives certification from private organization watchdogs and licenses from the states in which they operate. The other two types raise public safety concerns.

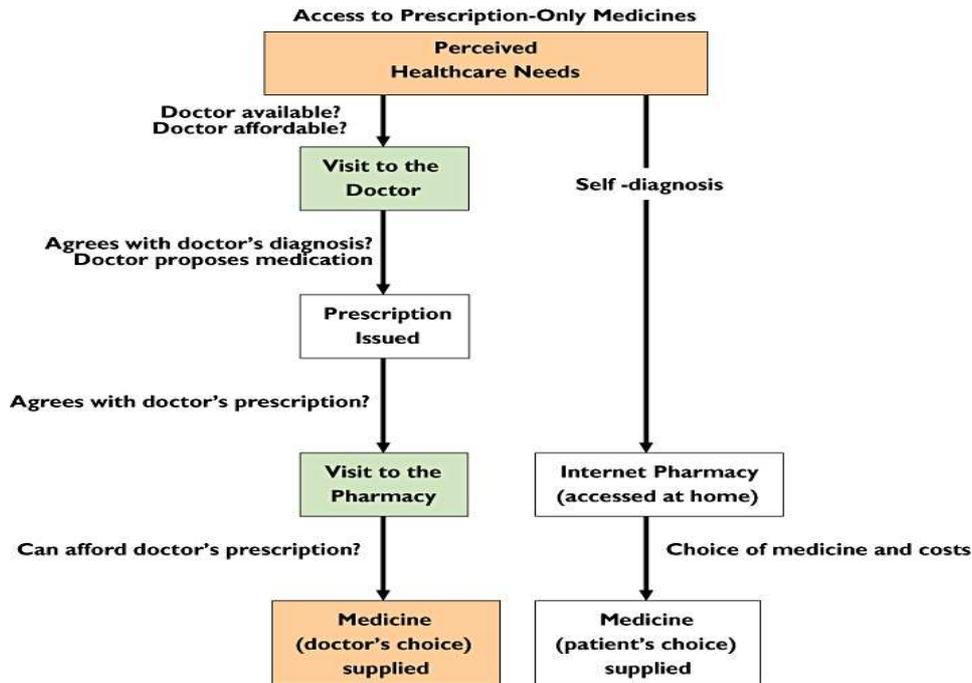


Fig 3: Comparison of dispensing of medicine by internet pharmacy and traditional pharmacy

RATING OF INTERNET PHARMACY

Online pharmacy [17] companies will only be successful if they make sure customers are satisfied with the service they receive. But what attributes of service quality lead to satisfaction and dissatisfaction? Quality dimensions of internet pharmacy lies in three categories:

1. Product cost and availability,
2. Customer service, and
3. The online information system.

Analysis tend to determine consumer satisfaction and points out ways to improve overall service quality in the Internet pharmacy arena.

REGULATION FOR INTERNET PHARMACY QUALITY.

The National Association of Boards of Pharmacy (NABP) created the VIPPS program in 1999 to verify and certify Internet pharmacies. A coalition of state and federal regulatory associations, professional associations, and consumer

advocacy groups provided their expertise in developing the criteria [16] which VIPPS certified pharmacies follow. VIPPS pharmacy sites are identified by the VIPPS hyperlink seal displayed on their website.

VERIFIED INTERNET PHARMACY PRACTICE SITES PROGRAM (VIPPS) VS NVIPPS

Internet pharmacies are state resident or nonresident channels for dispensing prescription drugs and health information to patients. The quality of Internet pharmacies is dependent on the credibility of patient information displayed on their websites. The credibility of patient information displayed on Internet [18] pharmacy websites is governed by whether it enables patients in making informed decisions on buying medications with respect to their easy access, convenience, price, and quality. The study was conducted to compare the non-VIPPS certified chain Internet pharmacies to VIPPS certified chain Internet pharmacies in terms of the website information they display for patients.

A study was conducted by National Associations of Boards of Pharmacy (NABP) to check Internet Pharmacies which includes the following:-

STUDY DESIGN: The National Association of Boards of Pharmacy (NABP) sponsors the Verified Internet Pharmacy Practice Site (VIPPS), a voluntary program that certifies each participating Internet pharmacy' quality. For patients' instant access, certified Internet pharmacy websites display the VIPPS seal on their home page while the NABP website displays the information on licensure, confidentiality and practices of the VIPPS certified Internet pharmacies. The six VIPPS certified chain Internet pharmacy websites displayed information elements detailing internet accessibility (website addresses, email ID); feedback or contact mechanisms (toll free phone number, store locations, working hours, site map); business history; list of products and services; patient privacy, confidentiality, and security; delivery methods; information on drugs and health services; and price information. Descriptive statistics on these information elements for the non-VIPPS certified chain Internet pharmacy websites were provided.

POPULATION STUDIED: The NABP website, the National Association of Chain Drug Stores (NACDS) 2002 membership directory and retail chain websites were data sources used. The websites of six VIPPS certified Internet pharmacies and 118 non-VIPPS certified Internet pharmacies of retail chains across the 50 states of USA were compared.

PRINCIPAL FINDINGS: The result was, out of the 185 retail chains, 64% had Internet accessibility without VIPPS certification. For the 36 % of retail chains that did not have Internet accessibility, 95.5 % did not have toll-free phone numbers. Of the 118 non-VIPPS certified Internet pharmacies, 86.4% had website names, 13.6% had email IDs and 3.4% had both. The 64% of retail chains with Internet accessibility were approximately distributed as follows with respect to size: less than 11 pharmacies (33%), 11 to 99 pharmacies (42%), 100 to 999 pharmacies (20%), 1000 to 1999 pharmacies (2.5%), 2000 to 2999 pharmacies (1%), and more than 3000 pharmacies (1.5%). Details were less frequently displayed on toll free numbers, shipping methods, prices, patient confidentiality, or list of products and services on the non-VIPPS certified Internet pharmacy websites compared to VIPPS certified Internet pharmacy websites.

CONCLUSIONS: The evidence of non-uniformity of relevant patient information between websites of VIPPS certified and non-VIPPS certified Internet pharmacies suggests that patients' ability to make decisions regarding quality of Internet pharmacy services may be compromised. The question is whether mandatory VIPPS certification may be a remedy to minimize Internet search time, and promote care, credibility, and easy access through Internet pharmacy, a convenient channel for purchasing medications.

pharmacies. You can buy pain relief medicines, allergy medicines, weight loss and others such as Diazepam. Valium, Alprazolam, Codeine, Propecia, Xanax, Acetaminophen, Lorazepam, and Ativan are all available. If you suffer from arthritis, blood pressure, or need an antibiotic, you will find the several available at the online pharmacy as well.

When you are looking at different pharmacies, be sure to check on shipping costs and services offered. Some orders

To be VIPPS certified, a pharmacy must:

1. Comply with the licensing and inspection requirements of their state and each state to which they dispense pharmaceuticals;
2. Demonstrate to NABP compliance with VIPPS criteria including patient rights to privacy, authorization and security of prescription orders, adherence to a recognized quality assurance policy, and provision of meaningful consultation between patients and pharmacists.

The National Association of Boards of Pharmacy has a voluntary program, Verified Internet Pharmacy Practice Sites (VIPPS), to certify legitimate Internet drug stores. To be listed, pharmacies must comply with licensing and inspection requirements in every state in which they do business.

TIPS ON CHOOSING AN ONLINE INTERNET PHARMACY

Ordering your prescription through an Internet Pharmacy can save you lot of money and also save you a trip to the local pharmacy. It is of prime importance that the internet pharmacy you choose is legitimate and offers the services and medicines that you are looking for. [19]

Numerous people save a large percentage by ordering their medicines from an internet pharmacy. This is especially helpful if you order regularly and order several at a time. Even veterinary medicines are available at an internet pharmacy. If you live in a remote area or a small town with a small pharmacy, it might be difficult to get some prescription medicines. An internet pharmacy has a large stock of medicines to serve people from different places.

FINDING AN INTERNET PHARMACY.

The best way to find an internet pharmacy that suits your requirements is to use an Internet search engine that will give you multiple options to choose from. There are special sites to verify pharmacy licenses and validate their business. You can also contact the Better Business Bureau Online to find out if there are negative reports from any pharmacies you have found.

Online pharmacies offer many categories of medicines for all different needs to suit your requirements. You can buy numerous popular medicines with the help of these internet take up to three weeks to arrive and you need to order in time to receive it before you run out of your current prescribed amount. If you need emergency medicine, it would probably be better to get your prescription locally.

Buy Quality Medicines

- Don't plan to buy medicines based solely on price, research first and make sure you are buying quality medicines. Make sure they have a valid street

Table-1:List of Internet Pharmacy

PHARMACY	WHERE INCORPORATED	DISPENSING FACILITIES
Accuratepharmacy.com	Texas	Texas
AdvanceRx.com	Texas	Alabama, Pennsylvania, Texas
Anthem Prescription	Ohio	Ohio
Caremark Inc.	California	Florida, Georgia, Illinois, Louisiana, Michigan, Minnesota, North Carolina, Pennsylvania, Tennessee, Texas, Washington
Clickpharmacy.com	Florida	Florida
CVS Washington Inc.	Rhode Island	Indiana
Drugstore.com	Delaware	Connecticut
Express Pharmacy Services/ Eckerd.com	Delaware	Florida, Massachusetts, New Jersey, Nevada, Ohio, Pennsylvania, Texas, Virginia, Washington
NCS Healthcare dba Care for life	Ohio	Washington
RxWEST Pharmacy	Colorado	Colorado
Tel-Drug Inc./CIGNA	South Dakota	South Dakota
Walgreens.com Inc.	Illinois	Arizona

Source: National Association Boards of Pharmacy, December 2003

address and phone number and licenses to practice in their country. Don't use an online Internet pharmacy unless it has a privacy policy. This is important to protect you from Internet spam and also your personal privacy.

- It would certainly not be a wise choice to order medicines you have never taken before, you should know what your prescription looks like. This will definitely help ensure that you receive the right drug and not a substitute or forge.
- Consult with a health care professional before ordering online prescriptions. And, don't mix medicines prior to consulting with a reputed doctor. Some medicines might cause serious side effects when combined with others.

Save at an Online Internet Pharmacy

Cost of drugs is rising drastically in recent years. An online Internet pharmacy can assist you in saving money on your prescriptions and other medicines. It is advised to take time to research your options to get the best prices on quality medications.

Potential benefits of online pharmacies include increased access, lower transaction and product costs, and greater anonymity.

DISADVANTAGE OF ONLINE PHARMACY

1. Attracted by easy money, doctors are prescribing drugs over the Internet for patients they've never met. They

could be exposing themselves to professional discipline and malpractice suits.[20]

2. Doctors don't prescribe some medicines to patients. However, people buy them online and directly obtain those medicines from an internet chemist which their doctors do not prescribe. People are unwilling to follow their doctor's advice due to many reasons. One of them is that they have developed tolerance to certain drugs and experience withdrawal symptoms if intake of the drug is not continued. The symptoms usually disappear within a few days but most patients seem not to understand this and continue to hover about in search of uninsured websites.[21]

CONTROVERSIES OF INTERNET PHARMACY

Online pharmacies have generated controversies, including the use of "cyberdoctors" on some sites, the dispensing of drugs without prescriptions from other sites, and the importation of prescription medications. Although some online pharmacies are legitimate and likely provide benefits to patients, other online pharmacies engage in questionable practices[15]. Numerous state and federal regulations and laws have tried to address controversies surrounding rogue Internet pharmacies. Because online pharmacies are increasingly common, clinicians may encounter patients asking for advice and information about online pharmacies. We review the regulatory framework governing online pharmacies and the potential risks and benefits of using online pharmacies

RESEARCH ON INTERNET PHARMACY

Eysenbach [22] studied cyber-pharmacies posing as a patient in whom the drug was contraindicated and applied for prescriptions. He found that though majority of websites did not provide the drug, some cyber pharmacies indeed delivered Sildenafil citrate [Viagra] though it was clearly contraindicated

Peterson [23] surveyed 33 Cyber pharmacy websites in the United States and found that most pharmacies provided all of the drugs in the survey. Patients were required to provide their own prescription at 88% of the sites, and 75% of sites used mail or fax to verify prescription integrity. More than 50% of sites had privacy policies posted and 64% used cookies.

Bonakdar [24] studied websites offering cancer cure and concluded that a number of websites offered cancer cure through herbal medication with little regard for current regulations.

Scaria [25] studied websites offering sale of Viagra and analysed the information provided to potential consumers regarding contraindications and found that though most of the websites provided information on contraindications, they were often incomplete.

Bessel et al [26] surveyed Internet websites selling medicines online, and found that a variety of malpractices like selling prescription-only medicines without one were rampant.

LEGAL / REGULATORY ISSUES

E-commerce is virtually a regulation free environment. Legal issues have been raised by Harrington [27], Stanberry[28] and Weisemann.[29] The legal issues from a pharmacist's perspective are that he/she may be charged for unlicensed practice and may have problems in taking legal action for reimbursement. From the consumer perspective, he/she is likely to have problems with quality assurance and consumer reprisal, due to the fact that liability issues are closely related to licensing and legal reach, which often is not possible in cross-border practice. Such legal issues have been recently addressed.[30]

There are also legal issues arising from the differences in law within countries or regions. For example, in Europe, companies are prevented from advertising drugs to customers[31], and are permitted in the United States.

From a regulatory from of view, several issues have been raised. It is also interesting to note that several approaches are underway to address these issues- like regulation [32] and trust-marking.[33]

ETHICAL ISSUES

Ethical conduct ensuring privacy and confidentiality of the patient is one of the cornerstones of medical practice. Selling drugs over the Internet obviously necessitates the collection and use of confidential medical information. In an anarchic world over the Internet, nobody can be sure of what happens to this information.[34] Moreover, the security of

electronic transactions is difficult to assess. Electronic environments inevitably carry significant non-zero probabilities of large information losses once a security breach has occurred.[35] Cases of Cyber-pharmacies not keeping privacy and confidentiality promises have also been reported.[36] Other issues like Trust have also been raised. Studies reveal that trust in drug information from traditional media sources such as television and newspapers transfers to the domain of the Internet[37], leading to utilization of the Internet for information search after exposure to prescription drug advertising.

CURRENT PERCEPTION OF INTERNET PHARMACY:

Traditional models of access to medicines are under threat. For decades, to obtain the newest and most powerful medicines patients have needed a prescription, usually written by a doctor after consideration of a differential diagnosis at a face-to-face consultation, which is subsequently dispensed after presentation at a pharmacy. Each 'prescription-only medicine' (POM) available in this way has been carefully considered by regulatory authorities prior to granting of marketing authorization for specified prescribing indications. The availability of POMs is now limited further in some health services by the emergence of government agencies, such as the National Institute of Clinical Excellence in the UK, that restrict prescribing of medicines that are considered less cost-effective. In an information-rich age when patients expect (and have been promised [38]) greater empowerment, this tightly regulated, professionally led environment leaves some frustrated and disenfranchized, particularly if gaining access to the doctor is difficult (or costly). This barrier may be addressed, in part, by the emergence of new prescribing groups such as pharmacists and nurses [39] but, for most, free choice to self-medicate is limited to a small number of safer 'over-the-counter' medicines.

However, this carefully regulated system is being progressively bypassed by the boom in internet drug sales. The number of on-line pharmacies offering to sell POMs directly to consumers is growing rapidly, with annual sales from Canada alone estimated to be worth \$726 million in 2005 [40]. Medicines commonly accessed in this way include analgesics (e.g. oxycodone), anxiolytics and sedatives (e.g. diazepam), antidepressants (e.g. fluoxetine), stimulants (e.g. methylphenidate), anorectics (e.g. phentermine) and others that are generally considered as 'lifestyle drugs' (e.g. sildenafil for impotence, finasteride for hair loss). Although some internet pharmacies may offer medical support ('cyber doctors') or apply a diagnostic questionnaire to gauge suitability, many will sell drugs, some of which are controlled or high risk, without a prescription and without requiring a visit to a doctor [41]. POMs available in this way are accessed by approximately 4% of US adults [42].

Various motivations may persuade members of the public to purchase POMs via the internet, in most instances discarding the involvement of skilled healthcare professionals. Convenience is a key factor, particularly for those who are disabled or housebound, who can order medicines from their own home in unlimited quantity 24 h a day. Another is cost. Internet pharmacies often make branded or generic POMs

available more cheaply. This underlies the phenomenal growth of Canadian sites selling to consumers forced to pay higher prices through the US market [40]. The internet sales model reduces overheads and provides a level of competition that cannot be matched by 'bricks and mortar' pharmacies. On-line pharmacies can also provide immediate access to a plethora of additional product information via hyperlinks and search programs. Some patients may have found it impossible to find a doctor willing to prescribe or able to prescribe the medicines they wish to take. Desperation may be a factor for those with serious or debilitating conditions (e.g. cancer [43]), where the best available healthcare has failed to match expectations. A final benefit for some is privacy, particularly valued for some lifestyle conditions that are a source of embarrassment or shunned by the medical establishments [44].

Other important trends have supported the growth of internet sales. There may be an increasing perception that prescription drugs, which carry the stamp of regulatory approval, are safe and constitute little more than another consumer item. This notion could be reinforced by the growing acceptance and prescription of analgesics and mood-stabilizing drugs and, in some countries, by widespread exposure to direct-to-consumer advertising [45]. The progressive affirmation of patient autonomy and empowerment in modern healthcare may have encouraged self-diagnosis and a willingness to procure the treatments thought necessary.

Although on-line sales by legitimate providers, run on a sound professional basis, may undoubtedly provide benefits, serious concerns have emerged about the overall impact of the internet pharmacy sector on public health. Many less reputable sites are openly engaged in illegal on-line trafficking of controlled drugs, which are now available unrestricted, even to the young. There is now a cybermarket for illegal distribution of drugs that are either unapproved by regulatory authorities, dispensed without a valid prescription, illegal versions of prescription drugs (some ineffective, out of date or contaminated), marketed with fraudulent health claims, or intended for recreational or criminal use [e.g. gamma hydroxybutyrate (GHB) used for body building and incapacitating victims of 'date rape']. Not surprisingly, misuse of POMs is accounting for an increasing proportion of US emergency room visits [46], and there have also been numerous reports of serious adverse events or interactions following internet purchases [47]. Many sites also lack the most basic e-commerce security features, thus putting personal information at risk.

Internet sales of POMs should now be recognized as a serious and growing public health issue that may ultimately pose a much greater threat to health than rofecoxib (Vioxx®) or any of the other recent medicines 'scandals'. We believe that urgent action is now required to tackle the worst excesses of this trade, but also to protect the benefits of legitimate on-line operations. This will require a combination of legislation review, law enforcement and public education, each of which poses considerable challenges. There is a need to redefine, in the internet age, what constitutes a doctor-patient consultation, in what circumstances this can occur on-line and whether this can lead to a valid prescription (without which the supply of popular narcotics, sedatives,

stimulants and anabolic steroids is already illegal in the UK and USA). Law enforcement agencies should take steps to block websites that breach these agreed basic professional standards. The ubiquitous nature of the internet requires a multinational approach to thwart the activities of those operating from countries where no relevant legal provisions are in place. There have already been some successes in enforcing current legislation [48], but we should recognize that the anonymity, ease of changing websites, use of multiple portals of access to anchor sites, and the potentially enormous profits to be made will mean that such measures are going to be only partially successful. It will clearly be important to bring together major stakeholders, including internet service providers, search engines, banks and credit agencies, and postal services as well as regulatory authorities.

As for so many public health issues, improved education and raised awareness of the hazards will be crucial. Such information is already provided by the regulatory authorities in the UK and USA [49,50], but is likely to be ineffective unless supported by campaigns through the media, internet search engines and service providers. These should highlight factors that suggest a less reputable site (e.g. failure to provide a physical address, lack of links to the national healthcare system, no requirement for a valid prescription, failure to ask for details about the patient or their doctor). Official approval of reputable businesses will also afford some protection for the unwary. Registration schemes for reputable businesses are already run by the Royal Pharmaceutical Society of Great Britain and the National Association of Boards of Pharmacy in the US and provide a model for the future [51,52].

CONCLUSION

Internet pharmacy has completed 10 years since its launch in 1999. Within short span of time it has reached a great height of success. This technology has proven its worth worldwide. The profit scenario is increasing by multiple folds, i.e. more than 50 billion \$.

By internet pharmacy, a wide selection of drugs, free medical consultation, free and speedy shipping, and unbelievably low prices, really low prices for online drugs, no online consulting fees, are a few of the benefits to be derived from an internet pharmacy. All you have to do is go online, find the site, browse the different medications available, prices and categories of the drugs online, without restrictions, or a prior prescription. You just click on your symptoms, and a variety of drugs instantly appear with the description and prices, all you have to do is choose the one you want click on it and select "buy". In doing this you eliminate the prescription fee, the long waits in line, visit to the doctor, and doctors' fees.

With reference to India, there are number of Indian consumer who access internet pharmacy for medicine, personal care, health products, beauty products, wellness product, from different country. With ample of advantages of Internet Pharmacy and scope of increase in e-commerce, govt. of India must think of Implementing Internet pharmacy/cyber pharmacy within couple of years.

Declaration of interest

The authors report no conflicts of interest. The authors

alone are responsible for the content and writing of the paper.

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