

KNOWLEDGE AND ATTITUDE TOWARD E-PHARMACY AMONG THE PHYSICIANS OF SOUTH RAJASTHAN, INDIA: A PILOT SURVEY

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ABSTRACT

Objective: The objective of the study was to assess the knowledge and attitude of physicians of South Rajasthan, India, toward e-pharmacy.

Methods: After obtaining ethical approval, this cross-sectional questionnaire-based study was carried out for 6 months at a tertiary care teaching hospital. Physicians willing to participate were included in the study. The study questionnaire comprised 10 questions which were validated by experts. Physicians were requested to fill up the questionnaire in the presence of researcher and return it back. Data were analyzed using Microsoft Excel Office 365.

Results: A total of 170 questionnaires were analyzed. Male/female ratio of the physicians was 1.24:1. About 91.76% of physicians had heard of e-pharmacy but only 22.35% had ever used it. About 89.41% of physicians had never asked patients to buy medicines from e-pharmacy. About 67.64% of physicians considered e-pharmacy as ethical. However, 56.47% of physicians thought that e-pharmacy is risky.

Conclusion: Physicians must remain up-to-date about these recent technologies like e-pharmacy; as it is expected to become much more common in the next few years. Ethical and non-risky methods should be adopted for the same by them. Overall, a balance should be maintained while opting for online pharmacy.

Keywords: E-pharmacy, Internet, Medicines, Physicians, Prescription.

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INTRODUCTION

In the present era of e-learning, online shopping is increasing day by day. Majority of the products are available online nowadays. These also include medicines for diseases, both prescription and non-prescription medications. Thus, an online pharmacy is an internet-based vendor that sells medicines and includes both legitimate and illegitimate pharmacies [1]. Such online pharmacy is also known as internet pharmacy or electronic pharmacy (e-pharmacy) or cyber pharmacy [2].

In majority cases, e-pharmacy medicines are dispensed to those consumers who have obtained a prescription from the doctor and submitted it to online pharmacy [3]. However, there are few risks with its purchase. The World Health Organization has also emphasized that e-pharmacy is associated with significant health risks [4]. These include easy approach and availability of illegal or unapproved drugs, and medications offered without a prescription [5]. Overall, e-pharmacy has made the process of procuring medicines extremely convenient for the consumers by providing easy opportunities to purchase, resulting in its increased demands globally.

In 2016, the value of Indian health-care medicine market was estimated at \$27.57 billion US dollars and is expected to reach \$55 billion US dollars by 2020 [6]. In May 2017, Alliance for Safe Online Pharmacies Global had conducted national polling firm according to which there were approximately 35,000 active online pharmacies globally and almost 96% online pharmacies did not comply with the U.S. federal and state laws and pharmacy standards; nearly 12% of online pharmacies (roughly 3400 sites) sold controlled substances like opioids; and 600 illegal online pharmacy websites were launched each month [7]. Among these, hardly 400 online pharmacies followed safety guidelines strictly and were certified by National Association of Boards of Pharmacies [8]. In 2015, Indian Internet Pharmacy Association was formed by 11 initial start-up e-pharmacy companies such as 1mg, Netmeds, Bookmeds,

mChemist, Medlife, Pharmeasy, Medidart, Medstar, Ziggy, Save on medicals, and Save my meds [9].

The distribution and selling of counterfeit medicines by illegitimate online pharmacies have increased too. This could result in patients not responding to the drugs prescribed for a particular disease. There is possibility of fake medicines being purchased from online pharmacy portals and consumed by the patients. Several nations have taken steps toward reducing and controlling the usage of e-pharmacy through warnings, consumer protection acts, and federal or state laws. However, Indian pharmacy laws remain the same for online and offline pharmacy [10]. Thus, even though the marketing of drugs over internet is an inevitable outcome of the booming e-economy; it does pose unique ethical, legal, and quality challenges which are important from the consumer, physician, and regulator's perspectives [11].

Globally, many studies have been conducted for knowledge and perception of online pharmacy among consumers [4,12,13]. However, literature search showed that there were hardly any studies which discussed the knowledge of physicians on the subject of e-pharmacy. Such studies could contribute in making e-pharmacy more reliable and safer for patient care in today's digital world. Thus, a questionnaire-based study was planned among the physicians to analyze their attitude and knowledge toward e-pharmacy.

METHODS

This cross-sectional, questionnaire-based study was conducted for a period of 6 months at the Department of Pharmacology of a Tertiary Care Teaching Hospital, South Rajasthan, India, only after obtaining an approval from the Institutional Ethics Committee. Physicians working at the study center and willing to participate were included in the study. A questionnaire was prepared for the study. It comprised 10 questions that were developed and validated by experts. After a few suggestions, this

validated structured questionnaire was used to evaluate the knowledge and attitude of physicians toward e-pharmacy. Study participants were explained about the purpose of study and then provided with the study questionnaire. They were requested to fill up the questionnaire in the presence of researcher and return it back. Questionnaire was supposed to be submitted voluntarily and their identity was kept anonymous. For each question except the last one which was a multiple-choice question, they were asked to respond either as "yes" or "no."

After entering the data in Microsoft Excel Office 365, statistical analysis was carried out using Microsoft Excel Office 365. The data were interpreted as number as well as percentage of acceptance and rejection.

RESULTS

A total of 170 questionnaires were analyzed. The mean age of physicians was 36.64±11.8 years within an age range of 24–70 years. The male:female ratio was 1.24: 1 with 55.29% of males and 44.71% of females. Majority physicians (57.06%) were the elderly while 42.94% were young.

Among 170 physicians, 84.11% were using internet frequently. Maximum 91.76% of physicians had heard about e-pharmacy, whereas only 22.35% of physicians had ever used it. Majority physicians (89.41%) had never asked their patients to buy medicines from e-pharmacy and 72.35% of physicians had never promoted e-pharmacy. Maximum 67.64% of physicians thought that it was ethical. However, 56.47% of physicians considered e-pharmacy as risky, while 92.94% of physicians thought that fraud could occur while uploading prescriptions (Table 1).

Last question was related to the features that attract the patients to buy medicines from e-pharmacy for which we got multiple responses from the physicians. Maximum 81.18% of physicians responded that discounts/low prices in e-pharmacy were the reason for attraction toward e-pharmacy among patients. Reduced numbers of visits followed by less delivery time were other attracting features for patients as responded by 67.64% and 60.58% of physicians, respectively (Table 2).

DISCUSSION

Internet has revolutionized the world by offering a platform to sell and purchase various products including medications online. Electronic pharmacy (e-pharmacy) system is a web-based application of technology and internet in the health sector as mentioned earlier. It mainly aims at reducing paper work and providing door-step delivery of medicines to the users; saving money, time, and efforts [14]. Few online pharmacies offer e-prescriptions too, sometimes without any physical examination or doctor's visit [8].

This is a first kind of knowledge and attitude study which has been conducted among physicians for e-pharmacy. The present study had both young and elderly groups of physicians, but majority of them were elderly or experienced physicians. A higher male/female ratio showed that the participation was slightly higher by male physicians compared to females. A study by El-Dahiyat *et al.* also showed similar results with higher number of male physicians [15]. In Alfahad *et al.* study which focused on consumer's perception, more than half of the respondents were male [12]. Thus, overall participation was noted more among males in both the scenarios.

In the present study, more than 80% of physicians were using internet frequently and shopped online. In this digital age, the numbers of internet users have risen very much. It is probably due to easy availability of internet services as well as products on online platforms with offers to lure the public. An increasing number of internet and smartphone users also prove that India has a bright future of online pharmacy, although this shall bring quite a few challenges along with opportunities [16].

Table 1: Response of physicians for all questionnaire items

Questionnaire item	Physician's response (n=170)	
	Yes (%)	No (%)
Do you use internet frequently and shop online?	84.11	15.88
Have you ever heard about e-pharmacy?	91.76	8.24
Have you ever used e-pharmacy?	22.35	77.64
Do you ever ask patients to buy medicine from e-pharmacy?	10.58	89.41
Do you consider purchasing medicines through e-pharmacy as risky?	56.47	43.52
Do you think that it is unethical?	32.35	67.64
Do you think that fraudery is possible while uploading prescriptions?	92.94	7.05
Do you think that it is difficult to maintain the security of patient's data online?	72.35	27.65
Do you like to promote patients to buy medicine from e-pharmacy?	27.65	72.35

Table 2: Response of physicians for features attracting patients for e-pharmacy

Attracting features	Physician's response n (%)
Low prices/discounts	138 (81.18)
Reduced number of patient visits to the hospital/pharmacy	115 (67.64)
Drugs delivered at home in less time	103 (60.58)
Regular chronic treatment	79 (46.47)
None of the above	4 (2.35)

Even though a majority of physicians had heard about e-pharmacy; maximum physicians had never used it. The concept of e-pharmacy has been publicized through various commercial sources of drug information such as advertisements on television, mobile apps or websites, seminars, and conferences. Thus, during their visit to conferences or online shopping portals, physicians might have come across advertisements and/or information related to e-pharmacy. However, its usage to buy medicines for themselves or for prescribing to the patients was not a common practice among physicians of the present study. This was because they preferred examining their patients in person before starting any treatment, especially for new cases as compared to follow-up cases. On the other hand, patients may have come across e-pharmacy portals and used them out of desperation in search of a second doctor or opinion, availability of medicines at lower prices as well as information on their adverse effects or cost, ease of drug delivery at home, etc. [11]. As per the study, question on whether the physicians ever asked their patients to buy medicines through e-pharmacy; almost 90% of physicians had marked it as "no." This also supported the concept of physically examining the patient before prescribing drugs. This would also help in preventing self-medication, drug misuse, or drug abuse at patient's end. It would also support the prescription of generic drugs, thereby improving patient's acceptability toward them [15].

In the present study, physicians had a mixed opinion regarding the purchase of medicines through e-pharmacy as being risky. Half agreed while remaining disagreed due to the pros and cons of e-pharmacy. Those disadvantages mentioned above such as self-medication, drug abuse, drug misuse, as well as others such as misdiagnosis, financial, and medical privacy issues, substandard or counterfeit drugs, and lack of prescription review could be termed as risks associated with e-pharmacy. Sah *et al.* study which focused on consumer's behavior

showed that majority respondents were concerned about the safety of medicines sold online [4]. In a study by Hertig *et al.*, the results of perception of risk toward online purchase of medicines were assessed and showed that majority respondents did not consider it as risky [13].

Ethical conduct ensuring privacy and confidentiality of the patient is one of the cornerstones of medical practice [17]. In the present study, majority physicians thought that e-pharmacy was ethical. This debate on whether e-pharmacy is ethical or not ethical is very subjective. It will always persist unless the laws pertaining to online sale of medicines (with or without prescription) are framed and regulated strictly by the governing bodies. In the USA, online pharmacies are allowed to operate based on certain restrictions, along with campaigns that are run to keep their consumers aware of various dangers related to purchase of drugs online [6]. India can also implement such policies for ethical functioning of e-pharmacies. However, the spread of substandard or counterfeit medicines as a result of unregulated online pharmacies stands as a public health risk [18-20].

Almost all the physicians participating in the study thought that fraudery is possible while uploading prescriptions. Nearly 70% of physicians in the study also thought that it would be difficult to maintain the security of patient's data online. As per the protocol, online sale of medicine requires collection of patient's personal and confidential medical information as well as bank account details. In today's unpredictable online world, nobody can take 100% guarantee of what will happen next with this information. More so, the security of electronic transactions is also difficult to assess [17], which may result in the misuse of these details and fraudery. Cases of cyber pharmacies not keeping privacy and confidentiality promises have also been reported [17].

Maximum physicians in the present study did not like to promote e-pharmacy to their patients. This may be due to above said reasons. However, apart from risks, fraudery, or ethical issues, there must be other reasons too as to why the physicians were not in favor of promoting e-pharmacy. These may include quality concerns or ineffectiveness for emergency purposes, etc. These reasons should be further evaluated in future studies.

Last question was related to the physician's opinion on features attracting patients/consumers for buying medicines through e-pharmacy. Majority considered discounts/low prices followed by reduced number of hospital/pharmacy visits and lesser drug delivery time as the influencing features. Chakraborty and Satsangi have also mentioned of similar advantages of online pharmacies such as lower prices, avail great choice, privacy, and convenience [6]. Desai cited that online pharmacies have gained popularity due to better pricing offers than offline stores, with increased access, lower transaction and product costs, convenience and greater anonymity for consumers as well as door-step delivery for the consumers, etc. [1].

Thus, even though e-pharmacy has few advantages to offer such as strict and accurate storage of patient's medication history, represcribing of drugs from previous records, safety, and security of the drug description process by alerting the doctor regarding any drug interventions such as drug reactions and permissible doses reduced errors of misreading of drug names, time saving, reduced drug prices, increased availability, and widened choices of medicines or delivery at home [14]; it does not compensate for the flaws and errors that it poses such as those mentioned earlier. The patient is also left without a proper medical examination as well as the fact that his/her prescription may never get reviewed for the correct drug regimen. Thus, even though e-pharmacy provides convenience and efficiency, especially for people living busy lives; it does assert a wrath of potential dangers to the consumer's health [21]. Cohen *et al.* study highlighted a desire to incorporate electronic signatures of physicians during purchase through e-pharmacy [22].

Thus, physicians and pharmacists should ask themselves as to why their patients would rather receive medications without a visit to

their local pharmacy or a face-to-face consultation and also which legitimate and legal practices the medical community can adopt to improve the physician-pharmacist-patient relationship with respect to online pharmacy [11]. Consumers or patients can be imparted with the knowledge about good online pharmacies and their importance through the medium of physicians, with an aim of strengthening the online health-care system of the country. Hence, online pharmacies have the potential to promote communication among pharmacists, physicians, and patients, ultimately benefitting the patients. Efforts to strengthen the security of internet-based communications between physicians, pharmacists, and other health-care professionals need to be implemented, as done by Intel which is a leading maker of computer and networking products [8]. Almutairi *et al.* study showed that majority physicians had positive perceptions regarding the concept of e-pharmacy, but they also indicated that this system required additional improvements in terms of functionality [23].

This study was conducted among physicians practicing in South Rajasthan only. Similar studies must be conducted in other states or countries to explore the knowledge and attitude about e-pharmacy in large number of physicians.

CONCLUSION

In this rapidly developing digital world, e-pharmacy is a stepping advancement in the health-care system. Physicians must remain up-to-date about such recent technologies like e-pharmacy; as it is expected to become much more common in the next few years. Telemedicine was being practiced earlier on a relatively smaller scale. However, recently, the regulatory authorities of India and other countries have also come up with guidelines for telemedicine practice by physicians in these present times of COVID-19 pandemic where social distancing is a must as well as door-step drug delivery can be made available. However, ethical and non-risky methods should be adopted by physicians at the time of dealing with e-pharmacy at all times. Patients can also be made to understand the importance of physical examination and offline prescribing. Overall, a balance should always be maintained between offline and online purchase of medicines.

AUTHORS' CONTRIBUTIONS

All the authors contributed to the preparation of the final manuscript.

CONFLICTS OF INTEREST

None.

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