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Online Pharmacies Have Not Yet Been Widely Accepted by the Public: A Survey Study

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ABSTRACT

The growth and expansion of online pharmacies have significantly transformed the drug supply chain, driven by consumer convenience and new behaviors arising from the pandemic. This study aimed to examine community perspectives on online pharmacies through a survey. A questionnaire was distributed to gather the attitudes of residents in Ahvaz, a major city in southwestern Iran. A total of 384 participants took part in the study. The data were analyzed using descriptive statistics through SPSS. Results indicated that while most people were aware of online pharmacies, a significant number remained unaware of their existence. Furthermore, individuals often choose not to use online pharmacies for several reasons, including concerns about privacy, security, and lack of trust, as they prefer shopping in person at local pharmacies. Additionally, satisfaction with online pharmacies was lower than expected, with nearly one-third of buyers reporting unaffordable experiences with their online purchases.

Keywords: Online Pharmacy, Telemedicine, Marketing, Consumer Behavior

INTRODUCTION

As a dynamic platform, the Internet has enabled numerous interactions along with the advertising and sale of diverse products, including pharmaceuticals (1). While the online marketing of pharmaceuticals represents a natural progression of the digital economy, it presents specific ethical, legal, and quality challenges. These challenges are significant for consumers (patients), physicians, and regulatory agencies (2).

Online pharmacies have thrived in the digital environment, offering a diverse range of services, including health and beauty products as well as prescription medications. Some pharmacies dispense drugs only with a valid prescription, while others offer online consultations for prescriptions and sell medications. Additionally, some pharmacies provide certain medicines without requiring a prescription (3).

Online pharmacies offer a wide range of medications directly to consumers through the Internet. Patients can order medicines with a doctor's prescription and have them delivered to their homes, significantly enhancing accessibility and convenience (4). These pharmacies, both websites and mobile applications, enable the online sale of healthcare products and services, making it more convenient for consumers to access medications and health-related items on digital platforms (5).

The rise of online pharmacies has changed the pharmaceutical supply chain. On the one hand, unlicensed online pharmacies pose a risk to patient safety by offering substandard or counterfeit medications. Thus, consumer awareness and legitimate certification systems are crucial (6). In recent years, online pharmacies have rapidly grown and expanded as an efficient option to meet users' pharmaceutical and healthcare needs. These changes are primarily driven by advances in information and communication technology, shifting

consumer behavior, and the need for easier access to medicines and healthcare products (7). The spread of infectious diseases and the restrictions imposed by the COVID-19 pandemic have also led to an increase in the use of online pharmacies, as many individuals sought safe and convenient ways to obtain medication (8).

Growing public awareness of health and an increasing willingness to use online services have driven the expansion of online pharmacies. Users can easily search for and compare information about medications, including side effects and prices, to make informed decisions. Furthermore, heightened awareness of online pharmacies may lead to an increase in the use of these services. Studies show that most people are open to consulting with doctors before making online purchases, which can build trust and enhance the safety of online medicine transactions (9).

The use of online pharmacies presents both advantages and disadvantages, significantly influencing consumer behavior and healthcare delivery. While they offer convenience and privacy, concerns about safety and regulation remain. With benefits such as 24-hour access, online pharmacies enable patients to order their prescribed medications from the comfort of their homes. This feature is particularly beneficial during crises or for individuals with mobility challenges (10). Additionally, online pharmacies typically offer lower prices than conventional pharmacies, which can help reduce the overall cost of obtaining medications (11). This is crucial for individuals who need to take their medications regularly. Another advantage of online pharmacies is their commitment to ensuring customer privacy. People can purchase their medications discreetly without drawing attention, which is particularly vital for individuals with sensitive health conditions (12). Furthermore, legitimate online pharmacies enhance the healthcare experience. They provide convenience and efficiency, allowing individuals to order at any time, and offer greater privacy than local pharmacies. These services are especially beneficial for homebound patients or those who live a considerable distance from conventional pharmacies (13).

However, online pharmacies also have some disadvantages. One of the main concerns is the quality and safety of the medications. A substantial portion of these pharmacies are unlicensed and unauthorized, which can lead to risks like the distribution of counterfeit or substandard medications (11). Additionally, the ease of access to medications may encourage self-administration, particularly regarding controlled substances, which can lead to abuse. Finally, regulatory challenges pose another disadvantage for online pharmacies. The lack of strict regulation can lead to fraudulent practices, underscoring the need for closer monitoring by health authorities (10).

User feedback on online pharmacies presents a complex landscape of patient experiences that illuminates both strengths and areas for improvement. Overall, patients generally hold a positive attitude toward online pharmacy services, especially concerning convenience and accessibility. However, issues such as waiting times and the quality of medication advice continue to represent significant concerns (14). The shortcomings of online pharmacies highlight two crucial risks related to self-diagnosis and self-medication. Consumers can obtain medicines without consulting a pharmacist or physician. In managed care systems, patients may experience long wait times to see a clinician, which can sometimes extend to several weeks. Consequently, some patients might choose to self-medicate rather than wait for an appointment or feel embarrassed to discuss their health

concerns with a physician (15). Cost can also be a drawback for online pharmacies, as some consumers may pay more for prescription medications ordered online. Additionally, high shipping costs and the inability to use insurance plans exacerbate this issue. The credentials of the prescribing physician are also a concern, as patients lack the means to verify the background of online doctors, who may be practicing outside their area of expertise (16). However, illegal online pharmacies pose serious health risks by dispensing prescription drugs without a valid prescription and relying solely on online questionnaires, bypassing face-to-face consultations with licensed physicians that are essential for identifying drug interactions and side effects. Therefore, it is crucial to regulate these illicit practices and promote legitimate online pharmacies in the healthcare industry and e-commerce sector. The medical community should also reflect on why patients prefer online pharmacies over conventional options and find ways to strengthen the physician-pharmacist-patient relationship (2).

This study aimed to explore users' perceptions of online pharmacies. Given the rapid growth of these services and their significant impact on consumer behavior, it is crucial to identify both their advantages and disadvantages. We examined users' opinions to understand their experiences better and the factors that affect their satisfaction and dissatisfaction. This study aims to enhance the services offered by online pharmacies and raise user awareness.

METHODS

This survey examined individuals' satisfaction and awareness of online pharmacies and their services. This approach was chosen because it offers a comprehensive overview of the current situation in the urban community and helps identify the strengths and weaknesses of online pharmacy services. A researcher-developed questionnaire was used as the research instrument. The questionnaire was distributed throughout Ahvaz, a major city in southwestern Iran, near pharmacies. It was administered in person, which helped increase the response rate and validity of the responses. In addition to public respondents, several pharmacy students and professionals in this field were also invited to complete the questionnaires.

The questionnaire included 21 questions specifically designed to measure the level of satisfaction and awareness of individuals regarding online pharmacies and related services. The questions combined both closed-ended and open-ended formats to elicit quantitative and qualitative responses. They were categorized into the following sections:

1. Demographic questions: This section included basic information such as age, gender, education level, and occupation of the respondents.
2. Awareness questions: This category focused on assessing the participants' knowledge about online pharmacies and their services.
3. Satisfaction questions: This section evaluated the participants' satisfaction and experiences with the services provided by online pharmacies.

To ensure the validity and reliability of the questionnaire, it was reviewed by several professors and experts in the field. This review process helped identify the strengths and

weaknesses of the questionnaire and facilitated necessary corrections based on the feedback received. A test-retest was also conducted to examine reliability, yielding an excellent reliability coefficient of r = 0.98, indicating high stability.

The research population consisted of the urban community, comprising literate residents of Ahvaz who were familiar with pharmacies and the Internet. Therefore, using the Cochran sample size formula, 384 participants were included in the study.

An ethical code (IR.AJUMS.REC.1403.603) for approving the research protocol was obtained from the Jundishapur University of Medical Sciences in Ahvaz, Iran. Additionally, to protect personal privacy, the questionnaire remained anonymous.

The collected data were analyzed using SPSS, a statistical application, employing descriptive and analytical analyses, including frequency distribution tables, means, standard deviations, and chi-square test.

RESULTS

The results revealed the following characteristics of the participants: 134 (34.9%) were male, and 250 (65.1%) were female. Additionally, 28 (7.3%) did not have a high school diploma, 97 (25.3%) held a high school diploma, 17 (4.4%) had an associate's degree, 160 (41.7%) possessed a bachelor's degree, 62 (16.1%) had a master's degree, and 7 (1.8%) earned a doctorate. Among these, 64 (16.7%) were students, 195 (50.8%) were employed, and 97 (25.3%) were unemployed. Furthermore, the youngest participant was 15 years old, while the oldest was 72, with a mean age of 36 years (CI = 36 ± 1.5; α = 0.05).

The results showed that out of 384 respondents, 253 (65.9%) were aware of the existence of online pharmacies, and 131 (34.1%) were unaware of their existence. Among the 253 respondents who were aware of online pharmacies, 93 (36.7%) had purchased from them. Additionally, 33 (35%) of those who had experience buying from online pharmacies reported an unfavorable experience with their purchase. Figure 1 illustrates the level of satisfaction among respondents with online pharmacies.

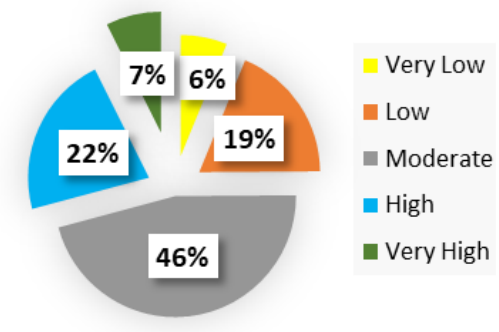

FIGURE I. THE RESPONDENTS' SATISFACTION LEVEL WITH ONLINE PHARMACIES

The results also indicate that, from the participants' perspective, online pharmacies do not offer any significant advantages over conventional pharmacies, with 255 participants (66.4%) preferring to purchase from conventional pharmacies.

Table 1 presents the respondents' attitudes toward using online pharmacies, as indicated by the questionnaire.

Moreover, the results of chi-square tests indicated a statistically significant difference between variables such as Age and Job status (student, employed, and unemployed) and responses to the questionnaire (p-value<0.05). However, a statistically significant difference between the variables of Gender and Educational level (under high school diploma, high school diploma, associate's degree, bachelor's degree, master's degree, and doctorate) and responses to the questionnaire was not confirmed (p-value>0.05). The responses to the questionnaire from the two groups, one of which was aware of the existence of online pharmacies and the other of which was not, revealed a statistically significant difference (p-value< 0.05).

TABLE I. PARTICIPANTS' RESPONSE TO THE QUESTIONNAIRE EXPRESSED AS PERCENTAGES

#	Items	Options						Mean of Response*
		Very High	High	Moderate	LOW	Very Low	No Response	
1	How familiar are you with online pharmacies?	2.6	17.4	29.7	26	24.2	0	**2.48**
2	How well do you understand the concept of online pharmacies?	4.7	16.4	39.3	24.7	13.3	1.6	**2.74**
3	How satisfied are you with online pharmacies?	3.9	12.2	30.5	14.3	4.7	34.4	**2.94**
4	How satisfied are you with your online pharmacy shopping experience?	2.9	14.6	26.8	6.3	9.6	39.8	**2.91**
5	How much time and cost do you believe online pharmacies can save?	20.6	35.9	24.5	9.9	4.4	4.7	**3.61**
6	How concerned are you regarding the security and privacy of online pharmacies?	4.7	25	29.7	21.9	10.7	8.1	**2.90**
7	How much do you value detailed images and descriptions of medications in online pharmacies?	17.2	35.2	30.7	10.4	2.1	4.4	**3.57**

8	To what extent do you believe that online pharmacies contribute to improving treatment adherence and the appropriate use of medications?	13.3	28.9	32.6	11.7	2.6	10.9	**3.43**
9	How much do you prefer using online pharmacies compared to conventional ones?	8.3	23.4	32.8	19.8	4.4	11.2	**3.13**
10	How satisfied were you with your online medication consultation experience?	2.6	12.2	31.3	10.4	3.6	39.8	**3.00**
11	To what extent do you think online pharmacies diminish prescription errors?	5.5	15.9	42.7	14.8	7.6	13.5	**2.96**
12	How much do you believe online pharmacies lower the overall cost of purchasing medications?	7	22.7	32.3	16.9	10.2	10.9	**2.99**
13	How satisfied are you with the after-sales service provided by online pharmacies?	3.6	8.9	26.8	11.5	5.7	43.5	**2.89**
14	How much do you believe online pharmacies enhance interaction and communication with patients?	5.7	12	37.8	19	8.9	16.7	**2.84**
15	How much time do you spend reviewing and comparing product prices from online pharmacies?	4.9	27.6	30.5	15.4	1.6	20.1	**3.24**
16	How satisfied are you with the variety of payment options available at online pharmacies?	5.7	21.4	20.1	10.2	3.1	39.6	**3.27**
17	How many of your medication purchases do you assign to online pharmacies?	8	7.3	20.3	22.7	17.4	31.5	**2.29**
18	How satisfied are you with the packaging and shipping of the medicine?	3.1	14.8	25.5	8.1	4.9	43.5	**3.06**

* To calculate the mean, the options were converted to numbers ranging from 1 to 5, corresponding to very low to very high, respectively.

DISCUSSION

The study's findings revealed that most users of online pharmacies were satisfied with their purchases. However, a significant concern was that many individuals have not used online pharmacies at all. This may be due to insufficient regulations governing the

distribution of medications and the limited role of pharmacists in the sale of drugs through these platforms. These challenges likely arise from an incomplete regulatory framework and the current state of online pharmacies (17).

One of the primary reasons people have not utilized online pharmacies may be the lack of familiarity and insufficient introduction to these pharmacies by the public. It is advisable that reputable and authorized pharmacies be presented to the public through various extensive means and that people be educated on how to use them effectively. Another factor is the public's lack of trust in online pharmacies. With the rapid increase of unauthorized online pharmacies, the sale of counterfeit or unapproved drugs has intensified, posing serious risks to individual and public health. Furthermore, unauthorized online pharmacies breach professional, legal, and ethical standards, leading to significant economic, social, and psychological consequences (18).

Online pharmacies face challenges in ensuring patient safety due to a lack of proper regulations, oversight, and enforcement. This deficiency can lead to the supply of counterfeit products, misuse, incorrect prescribing, insufficient patient monitoring, self-medication, and various other consequences. To address these challenges, leading countries are working to institutionalize regulatory laws and their accreditation. In Iran, it is also necessary to make timely decisions that, along with leveraging new technologies, protect the rights and health of patients and citizens in the best possible way (19).

Additionally, the import, production, and distribution of medications must be regulated to ensure that safe, effective, and high-quality medications are available throughout the country. Given the diversity of medications and manufacturing companies, as well as the risk of sending expired products, incorrect medications, different quantities, or incomplete packages, online pharmacies should accurately register product details on their websites, including the dates of manufacture and expiration, along with photos of the products. They should also exercise extreme care when preparing orders to ensure that the products match what was ordered and are sent to the customer in full. Providing site support with a 24-hour response time is also recommended.

People's concerns about how medicine is packaged, shipped, and delivered on time may contribute to their hesitation in using online pharmacies. Ensuring the product is intact before shipping and properly packaging it to prevent damage during transit is the responsibility of online pharmacies. They should inform customers of the expected arrival time and shipping method with minimal errors when placing their orders and provide tracking codes to allow customers to check the status of their orders. Additionally, online pharmacies can offer expedited shipping for urgent situations. Another reason people may avoid using online pharmacies is the limited support for prescription drugs from most of these services. Since electronic prescriptions have not completely replaced paper prescriptions, ordering medication from online pharmacies using paper prescriptions can be time-consuming and nearly impossible. However, fulfilling orders with electronic prescriptions is feasible by developing the proper infrastructure and frameworks, ensuring confidentiality and information security, and implementing regular monitoring by relevant regulatory bodies.

The sample size, the fact that a significant portion of participants did not use online pharmacies, and the distribution of questionnaires in only one city were among the limitations of this study.

CONCLUSION

While most participants were aware of online pharmacies, many still lacked a comprehensive understanding of their presence and operation. There are several reasons why people avoid using online pharmacies, including concerns about privacy, security, and a lack of trust, which leads them to prefer shopping in person at conventional pharmacies. Additionally, participants' satisfaction with online pharmacies has been lower than anticipated, with nearly a third reporting a negative experience with their purchases from these platforms.

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The research protocol was approved by Jundishapur University of Medical Sciences (AJUMS), Ahvaz, Iran, with no. U-03359.

CONTRIBUTORSHIP STATEMENT

R.H., S.D., and S.D. conceived the idea, and A.H. contributed to developing and designing the study. R.H., S.D., and S.D. performed the experiments and collected data. R.H., S.D., and S.D. analyzed the data. A.H. verified the results. All authors discussed the results. R.H., S.D., and S.D. wrote the first draft, and A.H. proofread it. All authors reviewed and commented on the manuscript, as well as all being responsible for the content of the manuscript.

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DECLARATION OF CONFLICTING INTERESTS

The authors declared no conflicts of interest regarding the research, authorship, and publication of this article.

DATA AVAILABILITY STATEMENTS

The data will be made available by the corresponding author upon reasonable request.

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