

ORIGINAL ARTICLE

Whether pharmacies are content with the adoption of the electronic prescription system?Ali Mohamad Hadianfard^{1*}, Hadith Mohammadpour¹ and Mahsa Humani¹¹Department of Health Information Technology, School of Allied Medical Science,
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ABSTRACT

Electronic prescription technology has been shown to reduce medical errors. However, there has been a lack of sufficient studies regarding electronic prescriptions in Iran. Therefore, a research study was conducted in 2022 to determine the satisfaction levels of pharmacy employees with the implementation of electronic prescribing. The aim of the study was achieved through a cross-sectional descriptive study, in which a researcher-made questionnaire was used to collect data. The participants were employees of pharmacies that used the electronic prescription system, and a total of 85 questionnaires belonging to 30 pharmacies were included in the study. The results showed that 60% of the participants believed electronic prescription technology improved prescription medicine, and 84% of the employees found it easy to work with the e-prescription software. However, 81% of the participants believed the software had many problems, and 77% of the respondents had issues with internet speed. Despite these problems, including slow internet speed, software problems, and time wastage, 73% of the respondents were satisfied with the electronic prescription system.

Keywords: Electronic Prescribing, Medication Errors, Telemedicine, Pharmacy

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INTRODUCTION

Prescriptions written in the traditional way, on paper, can put patients at risk due to the illegibility of some physicians' handwriting. This can lead to an increase in medical and pharmaceutical errors, which can be fatal (1). In America alone, about one hundred thousand people die each year due to medication errors that could have been prevented (2). In fact, statistics show that medication errors put one out of every ten patients in the hospital at risk (3). However, applying various new methods of information technologies can reduce the number of medical mistakes and increase the quality of patient care (4). One such method is electronic prescribing, which involves writing a prescription using a computer and having a pharmacy or paraclinical service provider deliver the prescribed services to the patient after checking (5). This technology overcomes the problems of paper prescriptions and significantly reduces medical errors while also reducing the workflow process and increasing patient satisfaction (1).

Electronic prescribing can be enhanced with clinical decision support systems, which can calculate drug doses electronically and provide necessary alerts for drug interactions and allergies (4).

The process of electronic prescribing involves a physician prescribing medicine electronically, the prescription being sent to the pharmacy, the pharmacist preparing the prescription and delivering the medicine to the patient, and finally, a copy of the prescription being archived (6).

While electronic prescriptions offer many advantages, there are also some challenges to consider, such as hardware and software problems, issues with design, high implementation costs, difficulty in connecting, and time-consuming processes, which can cause dissatisfaction among pharmacy staff (7).

Several studies have been conducted in different countries to assess the level of satisfaction and performance of electronic prescriptions. In Finland, a study showed that satisfaction with electronic prescriptions was high, although some employees had difficulty communicating with the system and still preferred the manual version (8). In Egypt, physicians and pharmacists were satisfied with the system but reported needing more training (9). Similarly, in Spain, the implementation of the electronic prescription system led to increased quality of care for patients, improved ease of treatment, and easier access to medical care, with employees generally satisfied with the system (10). In the European Union, the use of electronic health technology is a model for health promotion (11).

In 2022, Iran implemented electronic versions of prescriptions nationally. Currently, there is a lack of studies examining user satisfaction with this technology despite the short time frame for conducting such studies. To address this gap, this study was conducted to investigate the level of satisfaction of pharmacies with the implementation of electronic prescriptions.

METHODS

This descriptive study was conducted using a researcher-made questionnaire as the research instrument. The questionnaire was distributed to pharmacies in Ahvaz, a metropolitan city in southwest Iran. It was filled out by the technical manager of the pharmacy that uses the electronic prescription system through face-to-face interviews.

This questionnaire consisted of 20 questions that aimed to gather the opinions of participants on the electronic prescription system. The questions were divided into three categories. The

first set of questions focused on assessing the system's effectiveness in reducing errors while writing prescriptions. The second set of questions aimed to determine the system's role in reducing errors during the dispensing process. The third set of questions aimed to assess the system's effectiveness in facilitating pharmacy activities. Lastly, the last question was a general measure of the satisfaction level of pharmacies with the electronic prescription system.

A 5-level Likert scale ranging from completely disagree to completely agree was used to measure the response to the questionnaire. In the statistical analysis, the responses were converted to a 5-point scale ranging from 1 to 5, where 1 represented completely disagree and 5 represented completely agree. The mean score was 3.

The validity of the questionnaire was verified by presenting it to health information technology specialists and pharmacists, and its reliability was obtained through the test-retest test with a correlation coefficient of 85%.

The study was conducted on 200 pharmacies located in Ahvaz. However, due to some pharmacies being inaccessible to the research team, some being closed during the study, and some unwilling to participate, the study was carried out on only 127 pharmacies as a sample, which is in accordance with Krejcie and Morgan's sample size table (12).

An ethical code (IR.AJUMS.REC.1401.553) was obtained from Jundishapur University of Medical Sciences, Ahvaz. To protect personal privacy, the questionnaire was anonymous.

The data were analyzed using descriptive statistics in SPSS version 21, which included a frequency distribution table, mean, standard deviation, etc.

RESULTS

According to the results, 75.5% of pharmacies provided services during the day, while 24.5% offered non-stop service (operating 24/7). The research involved pharmacies located in all urban areas, ensuring a fair representation from all zones. As a result, the distribution of pharmacies in Ahvaz was analyzed based on eight different zones. Zone 2 had the highest number of pharmacies, while Zones 5 and 8 had the lowest numbers. Specifically, they accounted for 27.6% and 4.1% of the total number of pharmacies, respectively. In addition, the results indicated that the type of pharmacy and the zone had no statistically significant relationship with the response to the questionnaire ($p>0.05$).

Based on the findings, 66.4% of the participants expressed their belief that electronic prescriptions play a significant role in reducing medication errors concerning the names, while 77.6% of them agreed that it reduces errors in medication doses. Moreover, 57.2% of the participants reported that the use of electronic prescriptions reduces errors in prescribing medicines that have similar names. Also, 79.6% of the participants suggested that electronic prescriptions minimize errors in writing prescriptions and prevent the addition of unnecessary items.

68.3% of the respondents believed that using electronic prescriptions improved issues related to writing prescriptions for medication and reduced errors from drug interactions.

As per the feedback received from 71.5% of the participants, the implementation of the electronic prescription system has significantly reduced errors in the dispensing process. Additionally, 84.7% of the participants reported that the electronic prescription system has ensured the correct reading and accurate delivery of the prescription to the patient. Overall,



69.4% of the participants have opined that the electronic prescription system has increased the efficiency of pharmacists in the preparation of prescriptions.

The results indicated that 67.4% of participants reported that the integration of electronic prescribing with electronic medical records (EMR) has led to improved medication review, control, and management. However, 43.8% of respondents noted that e-prescribing was not always linked to EMR, while 49.9% believed that it was not always linked to the insurance system.

According to the results, 73.5% of the participants found it easy to work with the electronic prescription system and did not require any expertise. Additionally, 70.5% of the respondents believed that the electronic prescription system had all the necessary components. However, 61.2% of them reported that there were several technical issues in the electronic prescription system. Furthermore, 75.5% of the participants had problems with the internet speed required to connect to the system.

49% of participants believed that implementing the electronic prescription system was not expensive. Meanwhile, 60.2% stated that the system wasn't time-consuming compared to traditional methods. However, 79.6% of the participants reported that they were unhappy using the electronic prescription system due to issues in the system.

Table 1 shows that participants were generally satisfied with the system implementation as the mean of responses to questions was greater than 3.

TABLE I. THE AVERAGE RESPONSES OF PHARMACIES TO THE STATEMENTS OF THE QUESTIONNAIRE ABOUT IMPLEMENTING THE ELECTRONIC PRESCRIPTION SYSTEM

	statement	mean* \pm CI**	
1	The use of the electronic prescription system reduces errors in writing the names of medicine.	3.77	± 0.25
2	The use of the electronic prescription system reduces errors in prescribing drug dosages.	4.12	± 0.25
3	Using the electronic prescription system reduces errors caused by medicine with similar names.	3.39	± 0.25
4	Using the electronic prescription system reduces drug interaction due to incorrect prescribing.	3.07	± 0.25
5	Electronic prescribing prevents writing multiple prescriptions and reduces writing errors.	4.18	± 0.25
6	The electronic prescription system generally enhances the process of prescribing medicine.	3.86	± 0.25
7	The use of electronic prescribing reduces errors in the delivery of medicines.	3.86	± 0.25
8	Electronic prescribing increases the efficiency of pharmacists during the dispensing process.	3.92	± 0.25
9	Electronic prescribing improves the legibility of the prescription.	4.26	± 0.25
10	The electronic prescription system is consistently linked to the patient's electronic medical records (EMR).	3.31	± 0.25
11	The electronic prescription system is always connected to the patient's insurance system.	3.1	± 0.25
12	Connecting the electronic prescription system with the patient's electronic medical record allows for better check, control, and management of medicine.	3.82	± 0.25
13	The electronic prescription application is easy to use and requires no technical expertise.	3.86	± 0.25
14	The electronic prescription system has all the required components, such as the time, amount of dose, and the method of consumption.	3.87	± 0.25
15	The electronic prescription system is plagued with numerous software issues.	3.59	± 0.25
16	The implementation of the electronic prescription system is costly.	2.78	± 0.25
17	The internet speed is slow for connecting to the electronic prescription system.	4.01	± 0.25
18	Using electronic prescribing is more time-consuming than the traditional method.	2.61	± 0.25
19	Problems such as electricity and internet outages reduce the desire to use the electronic prescription system.	4.19	± 0.25
20	Could you please clarify your overall satisfaction with the electronic prescription system?	3.73	± 0.25



* The scale used for measurement ranged from 1 to 5, with a mean value of 3. If the mean of the responses is greater than 3, it indicates that satisfaction has been attained. Conversely, if the mean is less than 3, it suggests that satisfaction has not been achieved.

** Confidence Interval ($\alpha=0.05$)

DISCUSSION

The study's results indicate that pharmacies are generally satisfied with the electronic prescription system. According to a previous study by McLeod et al., electronic prescribing can reduce dispensing time and improve the quality of dispensing (13), which is consistent with the findings of this study. The study also found that the electronic prescription system has several benefits, including reducing errors in drug names and dosage, preventing the issuance of multiple prescriptions, increasing pharmacists' workflow efficiency, and ensuring that prescriptions are accurately read and delivered to patients.

However, the survey respondents noted that the electronic prescription system has several software problems. Palappallil's study found that software problems cause user dissatisfaction. Prescription application development companies should improve quality and address existing issues to reduce user dissatisfaction (14). Additionally, Alavi Amlashi et al.'s study showed that educating users about the benefits and problems of applications makes them easier to use (15).

DesRoches's study showed that the electronic prescription system has had a positive effect on communication between healthcare providers such as physicians, pharmacies, patients, and insurance companies (16). In this study, the participants were satisfied with the system being connected to the insurance systems and the patients' electronic medical records. The use of the electronic prescription system has also helped control costs, according to Marceglia et al.'s study (17), and the study's respondents agreed that the system is cost-effective, saves money on paper usage, and speeds up pharmacy activities.

Abramson et al.'s study demonstrated that the electronic prescription system reduced medication errors in a one-year period (18). Similarly, the study participants were satisfied with the reduction of medication errors. Satisfaction was also obtained from the reduction of writing errors and the improvement of drug prescriptions. These findings align with Abramson's study, which demonstrated that the electronic prescribing system reduced errors caused by the illegibility of medical prescriptions.

Walsh et al. concluded in their study that implementing the electronic prescribing system has decreased dangerous medication errors by 7% (3). The study's findings indicated that the participants believed that the electronic prescription system had reduced errors in prescribing the dosage amount, drugs with similar names, and drug names. These results were consistent with Jebraeilan's study (19), which showed an acceptable level of satisfaction in reducing drug interactions after implementing the electronic prescription system. However, there are still shortcomings in this field, and the developers of the electronic prescription system must improve the system's capabilities.

CONCLUSION

Overall, the electronic prescription system increases efficiency, improves drug prescriptions, reduces errors in drug delivery, and reduces costs, which is consistent with Ajami's study (20). However, slow internet speed and software problems are two significant

causes of dissatisfaction in pharmacies. It is hoped that by taking the necessary measures to reduce problems and provide more training to users, these issues will be resolved, and satisfaction with this system will increase.

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CONTRIBUTORSHIP STATEMENT

A.H. conceived of the idea. M.H., H.M. and A.H. developed and designed the study. H.M. and M.H. performed the experiments and collected data. A.H. and M.H. analyzed the data. H.M. verified the results. All authors discussed the results. H.M. and M.H. wrote the first draft with contributions from A.H., and All authors reviewed and commented on the manuscript, as well as all are 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 from the corresponding author on reasonable request.

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