





ORIGINAL ARTICLE

Evaluating user satisfaction with the electronic prescription system in Ahvaz medical centers: A social insurance organization perspective

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ABSTRACT

The electronic prescription system is a significant concern for medical staff today. In Iran, the social insurance organization, as a non-profit entity, is responsible for providing health insurance services. This research aims to evaluate the electronic prescription system of social insurance from the perspective of users in selected medical centers in Ahvaz. This descriptive and analytical research was conducted in 2022-2023. The study's statistical population comprised all users of the electronic prescription system in the pharmacies, laboratories, and

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clinics of medical centers affiliated with social insurance organization. The descriptive statistical methods used to analyze the checklist results were based on five Likert ranges. The results indicated a relative level of satisfaction among respondents in the medical centers of the Social Insurance Organization. Specifically, 58.6% of respondents rated the performance quality of the laboratory subsystem as high. In comparison, 37.3% and 30.7% of respondents rated the performance quality of the pharmacy and clinic subsystems as high, respectively. Despite the relative satisfaction with this system's features and its widespread use in social insurance-affiliated medical centers, some drawbacks hinder user interaction quality and can negatively impact the treatment process. Therefore, it is essential to identify and address these issues to improve the system.

Keywords: electronic prescribing, user interface, electronic health, social insurance

INTRODUCTION

Information technology (IT) plays a central role in the healthcare field in the 21st century, providing a wide range of services through e-health for both care providers and recipients. The European Union defines e-prescribing as the process of electronically transmitting a prescription from a healthcare provider to a pharmacy for medication dispensing to patients (1). Many countries use electronic prescription systems to enhance their electronic health systems (2).

In Iran, the electronic prescription project was first launched in 2015 to create an electronic health record in the doctors' offices contracted with the Social Insurance Organization, aiming to streamline the workflow of pharmacies and paraclinic centers. This electronic prescription system in Iran exclusively serves individuals covered by social insurance organizations in clinics affiliated with the organization.

Although electronic prescribing is not the main component of electronic health, it is a crucial tool for the development of e-health, enhancing the efficiency of services provided to patients (1). Electronic prescribing systems can either stand alone or be integrated into an electronic health record (EHR). Integrated electronic prescribing is generally considered ideal as it increases the availability of patient information at the time of prescribing. However, standalone systems, which are easier to implement and may be a viable option for providers, have not been adequately described (3).

Electronic prescribing is supported by computerized physician order entry (CPOE) systems. CPOE refers to various computer-based medication ordering systems that automate the medication ordering process. These systems offer varying levels of decision support, including checking drug-drug interactions, drug contraindications to allergies, and prescriptions against a patient's recent lab results. This results in alerts and reminders for prescribing doctors. These advanced features enhance patient safety and reduce costs by helping physicians and pharmacists identify potential therapeutic contraindications.

Computerized physician order entry (CPOE) systems significantly reduce the relative risk of medication errors by 13 to 99%. Medication errors can lead to adverse drug events (ADEs), which are defined as "any response to a drug that is harmful and unwanted" (4). It is evident that the quality of the implementation process affects the success of CPOE implementation, and inadequate planning can negatively impact both the process and the outcome of care (5).



When designed and implemented effectively, electronic prescription systems offer numerous benefits to the healthcare system, particularly for patients. These systems provide a platform for the safe transfer of electronic prescription information between parties, either directly or through an intermediary, thereby reducing the risk of data transmission errors. Additional benefits include cost savings for recipients, providers, health plans, and insurance organizations, reducing prescription forgery, accessing up-to-date prescription information, improving clinical workflows related to drug management, creating a secure national infrastructure for data exchange, and increasing the readability, accuracy, and completeness of prescriptions. Furthermore, electronic prescriptions facilitate knowledge sharing, ease of receiving prescriptions, better patient acceptance of medication, and increased patient satisfaction (6-9).

To ensure successful system implementation, frequent monitoring of system performance from the users' perspective is essential. Given the crucial role of electronic prescription systems in enhancing medical services, this study aims to investigate the efficiency and satisfaction of users, along with related factors, in the electronic prescription system of hospitals affiliated with the Social Insurance Organization of Ahvaz.

METHODS

This study is a cross-sectional descriptive study. Initially, various aspects of the electronic prescribing system were identified through field and library studies in databases, and by surveying users of the electronic prescription system and health information technology experts. Based on these results, a checklist was designed to meet the specific objectives of the research. The validity of the checklist was then assessed by two health information technology specialists and two medical informatics doctors.

The research data were collected using this checklist, which was completed by expert users of the electronic prescribing system working in the pharmacy, laboratory, and clinic units of the Social Insurance Organization's medical service centers, including Amirul Mominin (AS), Milad, and Shahid Rajaei Polyclinic Center affiliated with the Social Insurance Organization. The statistical population of this study comprised all users of the electronic prescription system in these pharmacies, laboratories, and clinics. The checklist was designed based on a five-point Likert scale, and the results were statistically analyzed using SPSS 20.

This study received ethical approvals from the Ethics Research Committee of Ahvaz Jundishapur University of Medical Sciences, Iran.

RESULTS

Pharmacy Subsystem Performance

The performance quality of the pharmacy subsystem in the electronic prescribing system of medical centers affiliated with the Social Insurance Organization has been assessed based on 22 criteria. According to the respondents, the performance quality of the pharmacy subsystem in these medical centers is distributed as follows:

- The lowest performance quality level is 11.8%, which falls within the 80-100% range.

- The highest performance quality level is 25.5%, which falls within the 60-80% range.
 - Additionally, 37.3% of respondents rated the quality of the pharmacy subsystem as high.
- These results indicate variability in the performance quality of the pharmacy subsystem in Figure I, with a notable proportion of users expressing a high level of satisfaction.

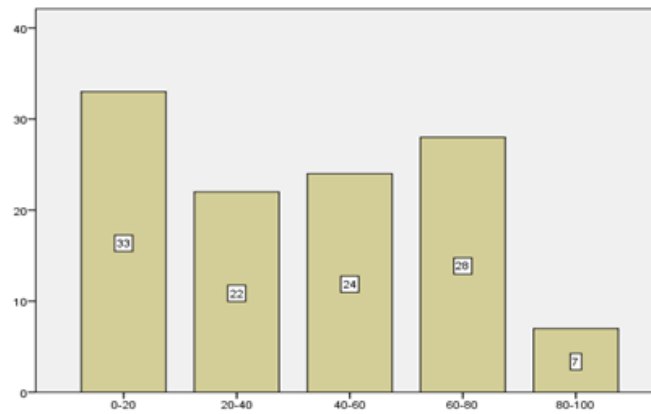


FIGURE I. THE PERFORMANCE OF ELECTRONIC PRESCRIPTION IN THE PHARMACY SUBSYSTEM

Laboratory Subsystem Performance

The performance quality of the laboratory subsystem in the electronic prescribing system of medical centers affiliated with the Social Insurance Organization is assessed based on 19 criteria. According to the respondents:

- 3.2% rated the performance quality within the 20-40% range.
- 30.9% rated the performance quality within the 60-80% range.
- 58.6% of respondents rated the performance quality of the laboratory subsystem as high.

These results indicate a significant portion of users view the laboratory subsystem performance positively, as illustrated in the Figure II.

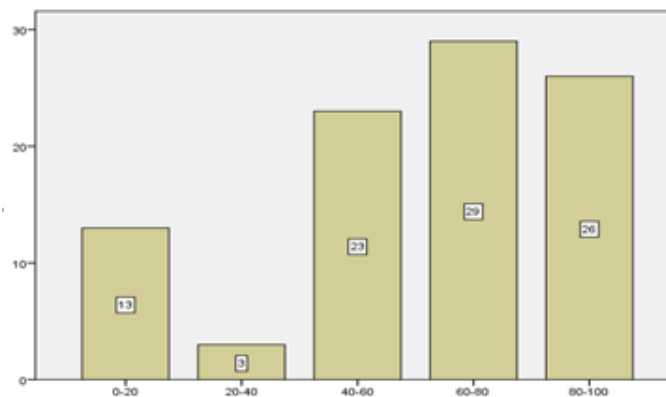


FIGURE II. THE PERFORMANCE OF ELECTRONIC PRESCRIPTION IN THE LABORATORY SUBSYSTEM

Clinic Subsystem Performance

The performance of the clinic subsystem in the electronic prescribing system of medical centers affiliated with the Social Insurance Organization is evaluated based on 23 criteria. According to the respondents:

- The lowest performance quality level is 6.1%, within the 80-100% range.
- The highest performance quality level is 28.9%, within the 0-20% range.
- 30.7% of respondents rated the performance quality of the clinic subsystem as high.

These findings suggest variability in the clinic subsystem performance, with a notable percentage of users expressing high satisfaction, as illustrated in the Figure III.

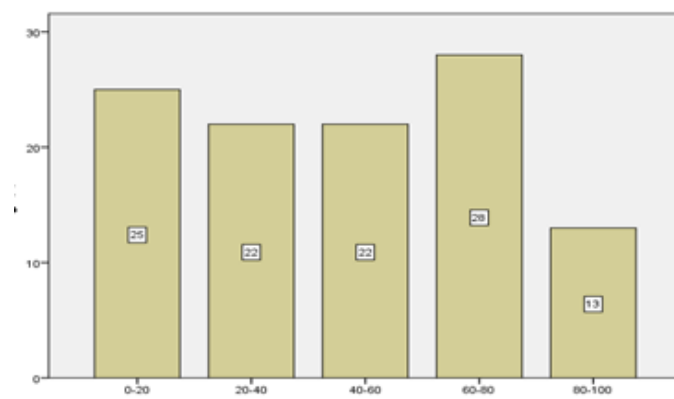


FIGURE III.. THE PERFORMANCE OF ELECTRONIC PRESCRIPTION IN THE CLINICAL SUBSYSTEM

User Satisfaction Levels for Pharmacy, Laboratory, and Clinic Subsystems

The Table I illustrates users' satisfaction levels of the pharmacy, laboratory, and clinic subsystems in the electronic prescribing system within teaching hospitals and medical centers affiliated with the Social Insurance Organization.

According to the respondents, satisfaction levels with the performance quality of these subsystems are measured using four criteria:

- The lowest satisfaction level, 10%, falls within the 20-40% range.
- A significant portion, 35%, falls within the 40-60% range.
- Overall, 40% of respondents expressed high satisfaction with the performance of the electronic prescribing system across the pharmacy, laboratory, and clinic subsystems.

These findings suggest that while there is room for improvement, a substantial number of users are satisfied with the system's performance.

TABLE I. THE LEVEL OF SATISFACTION OF USERS OF PHARMACY, LABORATORY AND CLINIC SUBSYSTEMS

Criteria	Response (%)				
	80-100	60-80	40-60	20-40	0-20
The level of satisfaction with the speed of system operation in the pharmacy	1	1	1	2	A
Satisfaction with the user relationship of the system in the pharmacy	1	0	4	0	0
User satisfaction of the system in the laboratory	1	3	1	0	0
Satisfaction with the user relationship of the system in the clinic	0	1	1	1	2
Total	3	5	7	3	2
Frequency	15	25	35	15	10

DISCUSSION

This study examined the electronic prescription system from the users' perspective in the medical centers of the Social Insurance Organization in Ahvaz. In this section, we discuss the results in relation to previous similar studies. The performance quality of the pharmacy subsystem in the electronic prescription system within these medical centers revealed that the laboratory subsystem performs at a higher level compared to the pharmacy and clinic subsystems. Additionally, the level of satisfaction with the performance quality of the pharmacy, laboratory, and clinic subsystems was assessed using four criteria. Respondents showed a relative level of satisfaction with the performance quality of the pharmacy, laboratory, and clinic subsystems in the social insurance electronic prescribing system.

In a review study titled "Electronic Prescription and Reducing Medical Errors," Ajmi. S and Savari. E (2016) concluded that medication errors related to inappropriate prescriptions are a significant threat to patient safety (10). They found that implementing an electronic prescribing system alongside an electronic health record can improve prescribing issues. Similarly, Shahamat. M et al (2022), in a cross-sectional descriptive study titled "Study of the Current Status of Prescription Writing and Electronic Prescription in Tabriz and Its Comparison with International Models," demonstrated that, according to most pharmacists and doctors in social insurance hospitals in Tabriz, the electronic prescription system reduces medication errors, organizes drug information, improves drug delivery by having patient drug records available, and reduces costs (11). Over half of the respondents found the system easy to use and beneficial in reducing physical contact and the transmission of various diseases, insurance deductions, and facilitating communication with insurance providers. These findings are consistent with research conducted in other countries, suggesting that electronic prescribing reduces medication errors, costs, and improves drug delivery and information organization.

Although users rated the performance quality of the pharmacy subsystem lower than that of the laboratory subsystem, they expressed relative satisfaction with the pharmacy subsystem's performance. This alignment indicates consistency with previous studies. The higher level of



satisfaction with the laboratory subsystem compared to other subsystems may be attributed to the presence of more advanced computer facilities in medical diagnosis laboratories, which have been in place for years before the implementation of the electronic prescribing system.

As one of the advanced countries in this field, the UK has distinct systems for prescribing and supplying drugs (12). Four UK studies have examined prescribing errors before and after the introduction of electronic prescribing. However, few studies have investigated the effect of electronic prescriptions on pharmacists' interventions. Of the few British studies that reported increased interventions and changes in their nature, only abstracts have been published.

CONCLUSION

Despite the widespread use of electronic prescribing systems across the UK, there are issues within each system that can negatively impact user interaction and potentially diminish the benefits of these systems from the users' perspective, ultimately affecting the quality of the treatment process. Therefore, it is essential for system designers and developers to identify and address these problems. Additionally, modifying the related infrastructure is necessary to resolve these issues.

Future studies should focus on the weak points in the laboratory subsystem of educational hospitals and the clinic subsystem of social insurance hospitals, where significant differences have been observed, and conduct deeper and more detailed investigations into these areas..

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CONTRIBUTORSHIP STATEMENT

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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