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Challenges of implementing the electronic health prescribing system: Perspectives of patients and community pharmacists in Mashhad, Iran

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Abstract

Electronic prescribing systems have been implemented for years in developed countries, whereas developing countries have limited experience in this field. In Iran, electronic prescribing officially replaced paper-based prescriptions in January 2022. Despite its numerous advantages, the system has imposed multiple challenges on patients, pharmacies, and other stakeholders. This study aimed to explore these challenges from the perspectives of patients and community pharmacists in Mashhad, Iran.

This qualitative phenomenological study was conducted with 22 participants, including patients and pharmacists working in community pharmacies in Mashhad. Data were collected through face-to-face semi-structured interviews and analyzed using qualitative content analysis. Coding and categorization were performed using MAXQDA Analytics Pro 2020.

A total of 496 codes were extracted and categorized into four overarching themes: (1) challenges of the electronic prescribing system, (2) proposed solutions, (3) SWOT analysis (strengths, weaknesses, opportunities, and threats), and (4) future outlook. The main challenges were divided into pharmacy-related and patient-related challenges. The most frequently reported subthemes were “reduced workflow speed” among pharmacists and “internet and infrastructure problems” among patients.

Stakeholders reported diverse challenges related to the electronic prescribing system. Internet disruptions and prescription confirmation failures, which result in delays or non-dispensing of medications, along with insufficient physician cooperation in registering and correcting prescriptions, have contributed to dissatisfaction among pharmacists and patients. Lack of integration among insurance servers, process complexity, and limited access to patients’ medication histories have further compounded these issues. Strengthening technical infrastructure and implementing comprehensive training programs for patients, pharmacists, and physicians are essential to improving system performance and stakeholder satisfaction.

Keywords: Electronic prescribing system, Health services management, Community pharmacy, eHealth, Patient

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Introduction

Prescription writing has historically relied on handwritten documentation as the primary method of communication regarding pharmacotherapy decisions. However, manual prescribing processes are inherently slow and prone to human and transcription errors, which significantly contribute to preventable medical errors (1).

Over the past decade, electronic prescribing (e-prescribing) has emerged as a key component of eHealth solutions for managing health-related data. E-prescribing refers to the electronic transmission of prescription information among stakeholders involved in the prescribing and dispensing process. The increasing demand for high-quality healthcare delivery, alongside governmental initiatives toward digital transformation, has positioned electronic prescribing systems as a strategic solution to address the shortcomings of paper-based prescriptions (2-4).

In addition to improving healthcare quality, electronic prescribing has been associated with cost reduction and enhanced patient safety (5). The system involves multiple stakeholders, including patients, healthcare providers, payers, and policymakers, each playing a critical role in its implementation and management (6). Successful implementation requires coordinated collaboration and robust health information infrastructure (7, 8).

In Iran, despite several pilot programs over previous years, nationwide mandatory implementation began in January 2022, accompanied by the elimination of paper prescriptions (9). Although adoption rates have increased substantially, operational and structural challenges persist. Given the absence of in-depth qualitative research examining these challenges within the Iranian healthcare system, this study seeks to explore stakeholder experiences in the city of Mashhad (10, 11).

Methods

Study Design

This qualitative study employed a phenomenological approach to explore stakeholders' lived experiences regarding the electronic prescribing system (12).

Participants and Sampling

The study population consisted of two primary stakeholder groups: community pharmacists and patients in Mashhad. Purposeful sampling with maximum variation was applied to capture diverse perspectives. Inclusion criteria for pharmacists included substantial experience working with the e-prescribing system. Patients were required to have received at least one prescription through the electronic system. A total of 22 participants were interviewed, including 10 pharmacists and pharmacy staff and 12 patients.

Data Collection

Data were collected through individual, face-to-face semi-structured interviews. Interviews lasted approximately 25–35 minutes for pharmacists and 15–20 minutes for patients. Interviews continued until theoretical saturation was achieved. All interviews were audio-recorded with informed verbal consent and transcribed verbatim.

Data Analysis

Data were analyzed using thematic analysis as described by Miles and Gilbert (2005) and Given (2008). Open coding was first conducted, followed by axial coding to develop thematic categories. MAXQDA Analytics Pro 2020 software was used for data management and coding. Cross-validation of extracted codes was performed by independent reviewers to enhance credibility.

Results

From approximately 540 minutes of recorded interviews, 496 open codes were extracted and categorized into four major themes:

1. Challenges of the electronic prescribing system
2. Proposed solutions

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3. SWOT analysis
4. Future outlook

1. Challenges of the Electronic Prescribing System

A total of 263 codes were related to system challenges, categorized as:

- Pharmacy-related challenges (92 codes)
- Patient-related challenges (101 codes)
- Other stakeholder challenges (physicians and insurers) (70 codes)

1.1 Pharmacy-Related Challenges

The most frequently reported pharmacy-related issues included:

- Reduced workflow speed
- Required costs and infrastructure
- Process complexity
- Economic losses due to system inefficiencies
- Patient complaints
- Lack of access to patients' prescription history
- Risk of dispensing errors

Reduced workflow speed was the most frequent concern, primarily attributed to:

- Internet disruptions
- Prescription confirmation delays
- Insurance platform instability
- Power outages
- Errors in physician registration
- System failures

Pharmacists reported that these disruptions significantly slowed dispensing operations and negatively impacted patient satisfaction.

Financial burdens were also reported, including:

- Need for additional computer systems
- Increased staffing requirements
- Internet expenses
- Opportunity costs

Pharmacists emphasized that system inefficiencies sometimes resulted in patients leaving without receiving medications, causing economic losses.

1.2 Patient-Related Challenges

The main patient-reported challenges included:

- Internet and infrastructure problems
- Overall dissatisfaction with the process
- Process complexity
- Increased visits to physicians and pharmacies
- Tracking code and national ID issues
- Limited access to prescription information
- Data security concerns

Approximately half of patient-related codes concerned internet disruptions, which prolonged medication dispensing times.

Many patients preferred the previous paper-based system, perceiving the electronic process as longer and more complicated. Failure to successfully register prescriptions sometimes required patients to revisit physicians, increasing time and financial burdens.

Tracking code issues (e.g., lost or undelivered SMS codes) were another frequently reported challenge.

1.3 Physician- and Insurance-Related Challenges

Although not the primary focus, participants identified:

Physician-related challenges:

- Lack of cooperation
- Prescribing errors
- Reduced prescribing speed

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- Limited access to patient history
- Difficulty using computers among older physicians

Insurance-related challenges:

- Slow or unstable websites
- Multiple confirmation steps
- Manual and time-consuming approval processes
- Server disruptions

Discussion

Electronic prescribing in Iran is approaching its second anniversary, and today more than ever it is possible to reassess its achievements, drawbacks, advantages, and shortcomings. So far, more than 80 million electronic prescriptions have been registered in Iran, of which 56% belong to the Social Security Insurance Organization, 39% to Health Insurance, and about 5% to other insurance organizations. Experience has shown that, despite its numerous benefits, electronic prescribing may create communication challenges between prescribers, pharmacies, and patients, which should be carefully considered by policymakers, implementers, and regulators. This study examined the challenges of the electronic prescription system from the perspective of two main stakeholders: pharmacists and patients. Several of the most frequent challenges reported in Iran and other countries were then reviewed.

Challenges similar to those in other countries:

1.1 Information security and confidentiality challenges

One of the main concerns of patients in studies conducted in other countries is ensuring the security and confidentiality of their personal information (13–17). In the present study, however, the concepts of privacy and information security were not considered major challenges by our patients, which may be due to a lack of awareness of their civil rights. Nevertheless, from the pharmacists' perspective, access to patient information was considered a strength of the system, as it can facilitate contacting patients in specific situations.

1.2 Process complexity challenges

1.3 Training needs

The complexity of this system and the need for awareness and training were common challenges among stakeholders including physicians, pharmacists, and patients, as mentioned by several interviewees in this study. In this regard, one of the proposed solutions in this study to accelerate widespread adoption of the system among all stakeholders and increase interaction with it is information dissemination, education, and cultural promotion (at the levels of patients, pharmacists, physicians, and managers). Similarly, in a qualitative study conducted in 2022 using semi-structured interviews to examine the advantages and challenges of electronic prescribing from the perspective of general practitioners (GPs) and pharmacists in Australia, the need for training for all stakeholders—especially patients and healthcare staff—was highlighted as a strategy to reduce the impact of lack of experience with new technologies on workflow efficiency (18, 19).

Challenges more specific to the Iranian:

According to a report by the Iran Health Insurance Organization published in the Iran newspaper regarding the latest available statistics on physicians' performance, out of 98,000 physicians who issued prescriptions in June 2023, about 90,000 physicians (92.5%) prescribed their patients' medications entirely electronically (20).

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This statistic is consistent with the evidence obtained in this study indicating that approximately 95% of prescriptions are currently issued electronically related to the financial burden (including costs associated with the use, implementation, and maintenance of the system) have been reported in many studies (21,22). One of the challenges mentioned by pharmacists in this study was the economic loss caused by the inefficiency of this system for pharmacies. Part of this issue stems from infrastructure problems such as internet and electricity outages, slow or disrupted insurance websites, and disruptions in prescription verification (such as barcode failures and loss of medication quotas). These problems slow down the workflow and, in addition to creating high opportunity costs for pharmacies, may in some cases lead to patients withdrawing or prescriptions not being dispensed.

Another part of the costs imposed on pharmacies under this system relates to the required infrastructure and facilities, including additional human resources, separate computer systems, and high-speed internet. All these expenses are added to the persistent financial losses pharmacies already experience due to delays in insurance reimbursements.

In addition, one of the most important challenges mentioned by patients in this study was the opportunity costs created by infrastructure problems such as internet outages, failure to register prescriptions, or not receiving tracking codes. In some cases, these issues lead to repeated visits to physicians and pharmacies, increased waiting time for prescription fulfillment, or even failure to receive the medication. In this regard, the Deputy Head of the Statistics and Information Technology Center of the Ministry of Health stated in an interview with Salamat Weekly on January 20, 2024, regarding the costs imposed on stakeholders by this system: "It was expected that if electronic prescribing were implemented, costs would also decrease. However, the intention was not that when cost reductions occur, only one group of stakeholders benefits from them, and only the basic insurance organizations gain from the situation" (23).

In a study by Alipour et al. conducted in 2023 examining patients' perspectives on the electronic prescribing system in Iran, challenges related to receiving the prescription tracking code via SMS—the main method used to track their prescriptions—were highlighted. The authors argued that greater focus on patient participation and consideration of their needs and circumstances in accessing prescription information and their user profiles within the system is essential for improving service delivery (24). In the present study, receiving the SMS tracking code was also associated with challenges such as the possibility of not receiving the message or losing the code.

Conclusion

If properly optimized and supported, the electronic prescribing system has the potential to enhance pharmaceutical care quality, reduce medication errors, improve resource allocation, and increase patient satisfaction. However, sustainable success depends on coordinated regulatory oversight, infrastructure investment, and stakeholder engagement.

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