

Challenges and Enablers of Electronic Community Health Information System Adoption Among Healthcare Workers in Saudi Arabia

Sultan Matar Althobaiti¹, Bandar Safar Alharthi², Mohammed Shaker Alotaibi³, Abdul Majeed Abdullah Attian Al Thaqafi⁴, Saad Omar Almalki⁵, Rasheed Mohamed alharthi⁶, Khalid Eidhaha Althagafi⁷, Mohammed Al-Ahmari⁸, Mosa Hassan Alfifi⁹, Hanouf Mohammed Alrazqan¹⁰, Amal M. Alsabeg¹¹, Ali M Algublan¹²

1. Health Information Technician, Taif, Saudi Arabia, althobaitisu203@gmail.com
2. Health Information Technician, Taif, Saudi Arabia, bandar_1401@hotmail.com
3. Health Information Technician, Taif, Saudi Arabia, moom51@hotmail.com
4. Health Information Technician, Taif, Saudi Arabia, althaqafiab1@gmail.com
5. Health Information Technician, Taif, Saudi Arabia, malk82714@gmail.com
6. Health Information Technician, Taif, Saudi Arabia, mnbvgdf@icloud.com
7. Health Information Technician, Taif, Saudi Arabia, khalid3246343@gmail.com
8. Health Information Technician, Taif, Saudi Arabia, alahmarimo1@gmail.com
9. Health Information Technician, Taif, Saudi Arabia, mo.505084@gmail.com
10. Optometrist, King abdulla specialized children hospital
11. Clinical Dietitian
12. Nursing, King Abdulaziz Medical City

Accepted: 06-06-2023

Published: 20-07-2023

Abstract

The adoption of electronic health information systems, including electronic community health information systems (ECHIS), is a critical component of healthcare modernization worldwide. In Saudi Arabia, initiatives such as the "Wasfaty" system aim to improve patient care and streamline healthcare delivery by leveraging e-prescribing and digital health services. However, the successful implementation of ECHIS faces numerous challenges, including technical barriers, organizational issues, and user adoption resistance. This paper explores the challenges and enablers of ECHIS adoption among healthcare workers in Saudi Arabia, drawing on global and local evidence. Using key frameworks such as the Theoretical Domains Framework (TDF) and insights from the Saudi Ministry of Health's Vision 2030 reforms, this paper highlights the role of education, training, infrastructure, and policy in overcoming barriers and promoting adoption. By addressing these factors, Saudi Arabia can maximize the benefits of ECHIS, ensuring improved patient outcomes and enhanced healthcare worker efficiency.

Introduction

The digital transformation of healthcare systems has revolutionized how patient information is managed, shared, and utilized. Electronic community health information systems (ECHIS), which include tools for e-prescribing, electronic medical records (EMR), and integrated health data, are central to this transformation. In Saudi Arabia, the Ministry of Health (MOH) has introduced systems like *Wasfaty*, which link primary healthcare centers, hospitals, and pharmacies to improve medication access and patient safety (Saudi Ministry of Health, 2023).

Despite the potential benefits of ECHIS, healthcare workers often encounter significant barriers to adoption, including technical challenges, lack of training, and resistance to change. Studies in other regions, such as the Danish National Electronic Prescribing System and Finland's *My Kanta* platform, underscore the importance of addressing structural and human factors to optimize ECHIS implementation (Aharaz et al., 2023; Eriksson-Backa et al., 2021). In Saudi Arabia, these barriers are compounded by the

rapid pace of healthcare reforms under Vision 2030, which aims to create a patient-centered, digitally connected healthcare system (Alharbi et al., 2022).

This paper explores the challenges and enablers of ECHIS adoption among healthcare workers in Saudi Arabia. Drawing on evidence from global and local contexts, it identifies key barriers and proposes strategies to promote adoption, emphasizing the importance of education, infrastructure, and policy support.

Challenges to ECHIS Adoption

1. Technical Challenges

One of the primary barriers to ECHIS adoption is technical complexity. Healthcare workers often face difficulties navigating the interfaces of electronic systems, which can lead to errors and inefficiencies. For example, the *Wasfaty* system, while designed to streamline e-prescribing, has been criticized for occasional system downtimes and issues with user-friendliness (Rasheed et al., 2024). A similar challenge was reported in the Danish National Electronic Prescribing System, where users highlighted the need for more intuitive designs to reduce cognitive load (Aharaz et al., 2023).

Moreover, interoperability between different healthcare systems remains a challenge. In Saudi Arabia, many hospitals and clinics operate on separate platforms, making it difficult to share patient information seamlessly. Studies have shown that lack of interoperability is a common issue in global ECHIS implementations, as seen in Ethiopia's electronic medical record system (Yehualashet et al., 2021).

2. Organizational Barriers

Organizational barriers, such as inadequate support and lack of clear workflows, also hinder ECHIS adoption. In Saudi Arabia, healthcare workers often report confusion regarding the integration of *Wasfaty* into their daily routines (Alzahrani et al., 2024). This lack of clarity can result in duplication of work, decreased efficiency, and frustration among staff.

Additionally, resistance to change is a significant obstacle within organizations. Healthcare workers may feel apprehensive about transitioning from paper-based systems to electronic platforms due to fear of job displacement or increased workload. This resistance was similarly observed in Australia, where nurses reported concerns about the time required to learn a new EMR system (Jedwab et al., 2022).

3. User Adoption and Training Gaps

The successful implementation of ECHIS depends on the willingness and ability of healthcare workers to adopt the technology. However, many healthcare workers in Saudi Arabia lack adequate training in using digital systems. Research shows that insufficient training is one of the most common barriers to ECHIS adoption globally, as seen in England's electronic prescription transmission system (Garfield et al., 2013).

In Saudi Arabia, studies have highlighted the need for continuous professional development to improve healthcare workers' digital literacy (Alharbi et al., 2022). Without proper training, healthcare workers may struggle to utilize ECHIS effectively, leading to errors and reduced system efficiency.

4. Policy and Regulatory Challenges

Policy and regulatory barriers can also impede ECHIS adoption. In Saudi Arabia, some healthcare workers have expressed concerns about data privacy and the legal implications of electronic prescribing (Rasheed et al., 2024). These concerns are not unique to Saudi Arabia; in Denmark, similar apprehensions were raised regarding the security of shared medication records (Aharaz et al., 2023).

Furthermore, the rapid pace of healthcare reforms under Vision 2030 has created challenges in aligning policies and regulations with the technological advancements being introduced. Healthcare workers may feel overwhelmed by the frequent changes, leading to resistance or non-compliance.

Enablers of ECHIS Adoption

Despite these challenges, several factors can facilitate the successful adoption of ECHIS in Saudi Arabia.

1. Strong Infrastructure

Developing a robust digital infrastructure is critical for ECHIS adoption. The Saudi government has made significant investments in healthcare infrastructure under Vision 2030, including the expansion of high-speed internet access and the implementation of cloud-based systems for data storage (Alharbi et al., 2022). These efforts have laid the foundation for effective ECHIS implementation.

2. User-Centered Design

Designing user-friendly interfaces can significantly enhance healthcare workers' experiences with ECHIS. For example, the optimization of Denmark's electronic prescribing system included the development of a prototype that prioritized usability and patient safety (Aharaz et al., 2023). Similar efforts in Saudi Arabia could improve healthcare workers' satisfaction with systems like *Wasfaty*.

3. Comprehensive Training Programs

Providing comprehensive training programs is essential for improving healthcare workers' digital competencies. Studies have shown that tailored training sessions, including hands-on workshops and online modules, can increase confidence and proficiency in using electronic systems (King et al., 2021). In Saudi Arabia, incorporating ECHIS training into medical and nursing curricula could ensure that new graduates are well-prepared for the digital workplace.

4. Supportive Policies and Incentives

Supportive policies and incentives can motivate healthcare workers to adopt ECHIS. For instance, offering financial rewards for successful system adoption or reducing workloads during the transition period can encourage compliance. The Saudi Ministry of Health has already demonstrated its commitment to digital health by launching initiatives like *Wasfaty* (Saudi Ministry of Health, 2023). Building on these efforts, policymakers can further support healthcare workers by addressing data privacy concerns and ensuring clear regulatory frameworks.

5. Patient-Centered Approaches

ECHIS adoption is ultimately aimed at improving patient care. Engaging patients in the adoption process, such as by providing them with access to their health records through user-friendly platforms, can enhance system acceptance. In Sweden, the *My Kanta* platform has successfully empowered patients to manage their prescriptions digitally, fostering trust and collaboration between healthcare providers and patients (Eriksson-Backa et al., 2021).

Case Study: The Wasfaty System in Saudi Arabia

The *Wasfaty* system serves as a prime example of ECHIS in Saudi Arabia. Launched by the Ministry of Health, *Wasfaty* connects hospitals, primary healthcare centers, and community pharmacies to streamline the prescription process. Patients can receive their medications from the nearest pharmacy without visiting a healthcare facility, enhancing convenience and accessibility (Saudi Ministry of Health, 2023).

While *Wasfaty* has been praised for its patient-centered approach, its implementation has faced challenges, including technical issues, insufficient training, and resistance from some healthcare workers (Rasheed et al., 2024). Addressing these barriers through infrastructure improvements, user-centered design, and training programs could maximize the system's potential benefits.

Recommendations for Promoting ECHIS Adoption

Based on the findings of this paper, the following recommendations can promote ECHIS adoption in Saudi Arabia:

1. **Enhance Digital Infrastructure:** Invest in reliable internet connectivity, cloud-based systems, and interoperable platforms to support seamless data sharing.
2. **Prioritize Training:** Develop tailored training programs for healthcare workers, including online tutorials, workshops, and certification courses.
3. **Engage Stakeholders:** Involve healthcare workers, patients, and policymakers in the design and implementation of ECHIS to ensure alignment with user needs.
4. **Address Data Privacy Concerns:** Establish clear regulatory frameworks to protect patient information and build trust among healthcare workers.
5. **Provide Incentives:** Offer financial rewards and workload adjustments to encourage healthcare workers to adopt ECHIS.

Conclusion

The adoption of electronic community health information systems is a crucial step toward achieving the goals of Saudi Arabia's Vision 2030. While challenges such as technical barriers, organizational resistance, and training gaps remain, enablers like robust infrastructure, user-centered design, and supportive policies provide a pathway to success. By addressing these factors, Saudi Arabia can ensure the successful implementation of ECHIS, ultimately improving patient care and healthcare worker efficiency.

References:

- Aharaz, A., Kejser, C. L., Poulsen, M. W., Jestic, S., Ulstrup-Hansen, A. I., & Jørgensen, L. M., et al. (2023). Optimization of the Danish National Electronic Prescribing System to improve patient safety: development of a user-friendly prototype of the digital platform shared medication record. *Pharmacy*, 11(2), 41.
- Alharbi, M. W. S., Almagrabi, E. M. S., Alamri, R. M., Albarqi, H. B., Algharbi, H. F., & Al Motairi, B. K., et al. (2022). Health care workers knowledge about the healthcare transformation in Saudi Arabia: an overview since the launch of Vision 2030. *Journal of Positive Psychology and Wellbeing*, 6, 2744–2757.
- Alzahrani, A. M., Felix, H. C., Alzhrani, A. A., Alharbi, K. K., Arbaein, T. J., & Shahzad, M. W., et al. (2024). Patient satisfaction with Saudi community pharmacy services (Wasfaty system). *Journal of Taibah University Medical Sciences*, 19, 711–719.
- Eriksson-Backa, K., Hirvonen, N., Enwald, H., & Huvila, I. (2021). Enablers for and barriers to using My Kanta – a focus group study of older adults’ perceptions of the National Electronic Health Record in Finland. *Information, Health & Social Care*, 46(4), 399–411.
- Garfield, S., Hibberd, R., & Barber, N. (2013). English community pharmacists’ experiences of using electronic transmission of prescriptions: a qualitative study. *BMC Health Services Research*, 13, 435.
- Jedwab, R. M., Manias, E., Hutchinson, A. M., Dobroff, N., & Redley, B. (2022). Understanding nurses’ perceptions of barriers and enablers to use of a new electronic medical record system in Australia: a qualitative study. *International Journal of Medical Informatics*, 158, 104654.
- King, R., Taylor, B., Talpur, A., Jackson, C., Manley, K., & Ashby, N., et al. (2021). Factors that optimise the impact of continuing professional development in nursing: a rapid evidence review. *Nurse Education Today*, 98, 104652.
- Rasheed, M. K., Alrasheedy, A. A., Almogbel, Y., Almutairi, M. S., Alkhalifah, F. A., & Alkhuwaylid, M. F., et al. (2024). Patients’ perspectives and experiences with the national e-prescribing service and transfer of pharmaceutical services to community pharmacies in Saudi Arabia. *Informatics in Medicine Unlocked*, 47, 101502.
- Saudi Ministry of Health. (2023). *Wasfaty–electronic prescription system overview*. Riyadh: Saudi Ministry of Health.
- Yehualashet, D. E., Seboka, B. T., Tesfa, G. A., Demeke, A. D., & Amede, E. S. (2021). Barriers to the adoption of electronic medical record systems in Ethiopia: a systematic review. *Journal of Multidisciplinary Healthcare*, 14, 2597–2603.