Multi-Disciplinary Publishing Institute Pakistan **Vol.** 03, **N0.** 02

Submitted: 09 MAR 2025 Accepted: 11 APR 2025 Published: 13 APR 2025

Original Article

Healthcare Quality Enhancement through Implementation of E-Health Records in Saudi Hospitals: An Investigation into the Prospects and Challenges

Abboud Sabriya
Department of Economics
University of California, San Jose, California, USA
Email: sabriyaabboud@gmail.com

Ghulam Muhammad Kundi
Department of Health Informatics
College of Applied Medical Sciences
Qassim University, Buraydah 51452, Kingdom of Saudi Arabia
Email: g.muhammad@qu.edu.sa

Citation

Sabriya, A., & Kundi, G.M. (2025). Healthcare quality enhancement through implementation of eHealth records in Saudi hospitals: An investigation into the prospects and challenges. *Open Access Public Health and Health Administration Review*, 3(2), 37-46.

WEBSITE: www.mdpip.com
ISSN: Print: 2959-619X
ISSN: Online: 2959-6203
PUBLISHER: MDPIP

Abstract

The adoption of Electronic Health Records (EHRs) has become a cornerstone in modern healthcare systems worldwide, promising to enhance the quality of care through improved data accessibility, patient safety, and clinical decision-making. In Saudi Arabia, the Vision 2030 initiative has accelerated the digital transformation of the healthcare sector, with EHRs playing a pivotal role. This study aims to investigate the prospects and challenges of healthcare quality enhancement through implementation of e-health records in Saudi hospitals. This research article explores the prospects and challenges of implementing EHRs in Saudi Arabia to enhance the quality of care. The study employed cross-sectional research design, and a structured survey method was applied using a questionnaire that targets key stakeholders in Saudi healthcare institutions. Through overcoming barriers related to privacy, cost, and training, Saudi Arabia can leverage EHRs to significantly improve its healthcare landscape. The study highlights the potential benefits of EHRs, including streamlined workflows, reduced medical errors, and better patient outcomes. However, it also identifies significant challenges such as data privacy concerns, interoperability issues, and resistance to change among healthcare professionals. The article concludes with recommendations for policymakers, healthcare providers, and technology developers to address these challenges and maximize the potential of EHRs in Saudi Arabia.

Keywords: Electronic Health Records (EHRs), Quality of Care, Saudi Arabia, Healthcare, Digital Transformation, Challenges and Prospects.

Introduction

The healthcare sector in Saudi Arabia is undergoing a significant transformation as part of the Kingdom's Vision 2030 initiative, which aims to diversify the economy and improve public service delivery. One of the key components of this transformation is the adoption of digital health technologies, particularly Electronic Health Records (EHRs). EHRs are digital versions of patients' paper charts that provide real-time, patient-centered records, making health information available instantly and securely to authorized users. While EHRs have the potential to revolutionize healthcare delivery, their implementation in Saudi Arabia is not without challenges.

This article examines the prospects and challenges of EHRs in enhancing the quality of care in Saudi healthcare. This article provides a comprehensive overview of the prospects and challenges of EHRs in Saudi Arabia, offering valuable insights for policymakers, healthcare providers, and researchers. The continuous evolution of healthcare technology has brought about significant shifts in how healthcare services are delivered. E-health records (EHRs) are at the forefront of this transformation, representing a digital version of a patient's paper chart. This research article aims to explore the prospects and challenges of implementing EHRs in enhancing the quality of care within Saudi healthcare institutions. By focusing on recent advancements and obstacles, this essay seeks to inform stakeholders about the potential benefits of EHRs while highlighting the challenges that must be addressed to optimize their utility.

The primary objective of this research is to evaluate how EHRs can improve patient care quality through better data management, accessibility, and coordination among healthcare providers. EHRs enable real-time access to patient information, facilitating timely and informed decision-making. According to Hassey *et al*. (2020), the implementation of EHRs in Saudi hospitals has led to improved clinical outcomes, enhanced patient safety, and streamlined workflows. For instance, a study in Riyadh's healthcare facilities found a notable reduction in medication errors primarily due to better access to patient medication histories through EHRs.

Furthermore, the integration of EHRs promises to enhance collaborative care practices. Providers can share patient information seamlessly, fostering a more coordinated approach to treatment that can significantly enhance patient experiences and satisfaction (Biyun, 2021). Moreover, for policymakers in Saudi Arabia, EHRs offer valuable data for health system improvement and research, driving evidence-based decisions that can reshape healthcare delivery.

Nonetheless, several challenges accompany the integration of EHRs in Saudi healthcare institutions. Resistance to change among healthcare providers remains a critical barrier. Many clinicians are accustomed to traditional paper-based systems and express concerns regarding training, usability, and data security (Alharthi *et al*., 2021). Additionally, the initial financial investment for EHR systems can be substantial, posing a challenge for public and private institutions alike.

Another significant challenge is the issue of data privacy. With sensitive patient information residing in digital systems, the risk of cyberattacks increases, necessitating robust security measures (AlFadhli, 2022). Ensuring compliance with regulations, such as the Health Insurance Portability and Accountability Act (HIPAA) in the United States, which influence data handling practices, is also crucial in the Saudi context. While the prospects of EHRs in enhancing the quality of healthcare in Saudi institutions are substantial, addressing the accompanying challenges is vital for successful implementation. By fostering a culture of adaptability among healthcare providers and investing in security measures, Saudi Arabia can leverage EHRs to improve healthcare quality significantly.

This research article explores the prospects and challenges of implementing EHRs in Saudi Arabia to enhance the quality of care. This study aims to investigate the prospects and challenges of healthcare quality enhancement through implementation of e-health records in Saudi hospitals.

Literature Review

Prospects of EHRs in Saudi Arabia

1. ***Improved Data Accessibility and Sharing***

EHRs enable healthcare providers to access patient information seamlessly across different healthcare facilities. This is particularly important in Saudi Arabia, where the healthcare system is fragmented, with both public and private providers. EHRs can facilitate better coordination of care, reduce duplication of tests, and ensure that patients receive timely and appropriate treatment (Almalki *et al*., 2021).

2. ***Enhanced Patient Safety***

EHRs can significantly reduce medical errors, which are a major concern in healthcare systems worldwide. Features such as electronic prescribing, clinical decision support systems, and automated alerts can help healthcare providers avoid medication errors, allergic reactions, and other adverse events (Alhuwail *et al*., 2020).

3. ***Streamlined Workflows and Efficiency***

The implementation of EHRs can streamline administrative and clinical workflows, reducing the time spent on paperwork and allowing healthcare providers to focus more on patient care. This can lead to increased productivity and reduced healthcare costs (Alkraiji *et al*., 2021).

4. ***Better Patient Outcomes***

By providing healthcare providers with comprehensive and up-to-date patient information, EHRs can support evidence-based decision-making and personalized care. This can lead to improved patient outcomes, particularly for chronic diseases such as diabetes and hypertension, which are prevalent in Saudi Arabia (Alharbi *et al*., 2020).

Challenges of EHRs in Saudi Arabia

1. ***Data Privacy and Security Concerns***

One of the most significant challenges of implementing EHRs in Saudi Arabia is ensuring the privacy and security of patient data. The Kingdom has stringent data protection laws, and any breach of patient confidentiality could have serious legal and ethical implications (Almazroa *et al*., 2021).

2. ***Interoperability Issues***

The lack of interoperability between different EHR systems is a major barrier to their effective implementation. In Saudi Arabia, where healthcare providers use a variety of EHR systems, the inability to share data across platforms can hinder the coordination of care and limit the potential benefits of EHRs (Alkraiji *et al*., 2021).

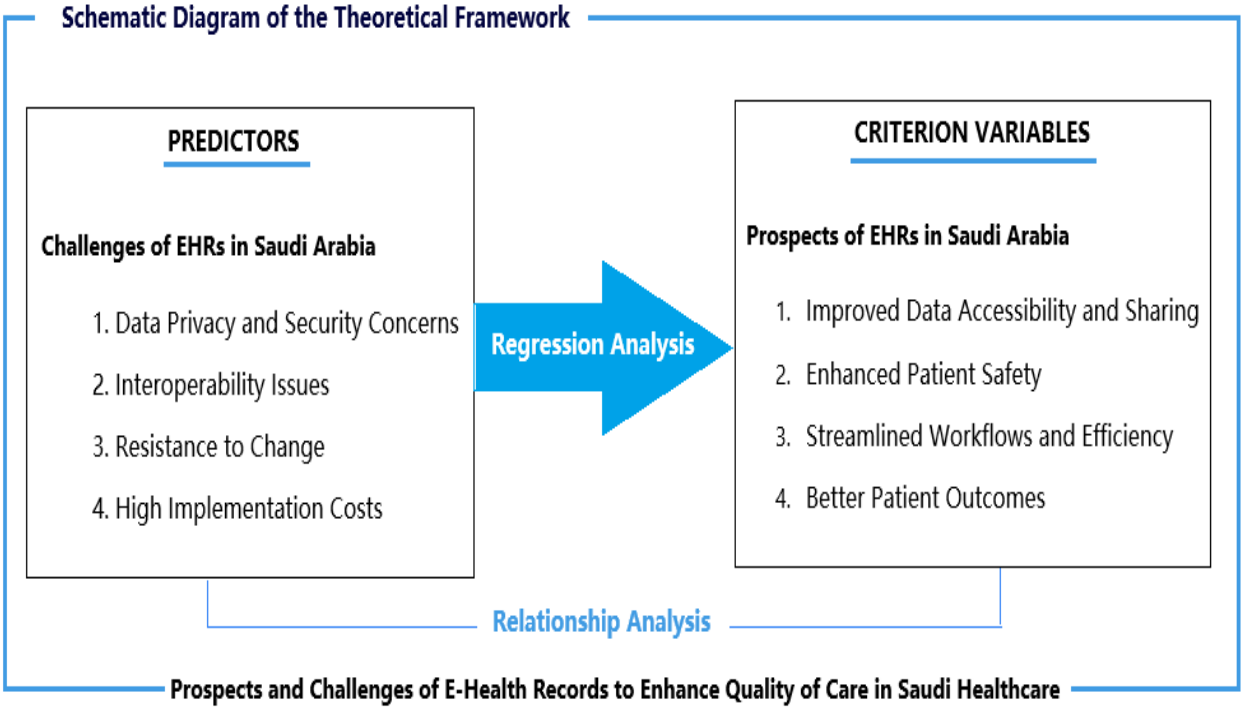
3. ***Resistance to Change***

The adoption of EHRs requires a significant cultural shift among healthcare professionals, many of whom may be resistant to change. This resistance can stem from a lack of training, fear of technology, or concerns about increased workload (Alhuwail *et al*., 2020).

4. ***High Implementation Costs***

The initial cost of implementing EHRs can be prohibitively high, particularly for smaller healthcare facilities. In addition to the cost of the software, healthcare providers must invest in infrastructure, training, and ongoing maintenance (Almalki *et al*., 2021).

Figure 1
Schematic Diagram of the Theoretical Framework



Proposed Hypotheses

Based on review of the previous studies, objectives, and problem understudy, the theoretical framework of the study was developed. The schematic disarm of the theoretical framework in Figure 1 describes the relationship and impact among / on the predicting variables and criterion variables; based on which we have proposed the following hypotheses:

1. The predictor and criterion variables are mutually associated with one another positively and significantly (H_1).
2. The predictors have significant direct effect on the criterion variables, and they positively and significantly predict the criterion variables (H_2).

Method

The integration of electronic health records (EHRs) in Saudi healthcare institutions presents both significant prospects and challenges that could enhance the quality of healthcare services. As the country pushes toward modernization and the development of its healthcare infrastructure, understanding these dynamics is essential. This research explores both the advantages and hurdles of EHR implementation, alongside a proposed method for a survey to gather pertinent data from healthcare stakeholders. EHRs offer various benefits that can improve the quality of healthcare delivery. These systems allow for real-time access to patient data, which leads to better clinical decision-making. According to Alhussain *et al.* (2021), EHRs can improve communication among healthcare professionals, thereby enhancing patient care coordination. Moreover, EHRs facilitate data management and the ability to track patient outcomes over time, which is crucial for public health monitoring and individual treatment plans (Tulu *et al*., 2020).

However, the implementation of EHRs also encounters numerous challenges. Data privacy and security are paramount concerns, especially in a country like Saudi Arabia, where a significant focus is on protecting patient confidentiality (Khan *et al.*, 2021). Additionally, the high costs associated with the deployment and maintenance of EHR systems pose a barrier for many institutions, particularly smaller clinics that may lack sufficient resources. Furthermore, a lack of adequate training for healthcare workers on how to effectively use EHRs can lead to resistance and, ultimately, ineffective utilization of these systems (Zain *et al*., 2020).

Survey research is a vital methodological approach in health research due to its capacity to gather large volumes of data from diverse populations efficiently. Surveys allow researchers to collect standardized information on health behaviors, attitudes, and outcomes which are crucial for identifying trends, assessing needs, and evaluating interventions. In recent years, the importance of health surveys has been underscored by global health initiatives that aim to respond to emerging health crises, such as the COVID-19 pandemic. For instance, surveys have been instrumental in understanding public perceptions of vaccines, determining behavioral changes due to lockdowns, and assessing mental health impacts during the pandemic (Paltiel *et al*., 2021).

This quantitative approach can provide insights that are not only statistically significant but also generalizable to larger populations, enabling policymakers to make informed decisions. One primary justification for utilizing survey research in health settings is its cost-effectiveness and scalability. Surveys can be administered online or via telephone, which reduces logistical challenges and expenses associated with in-person data collection (Wright, 2020). Additionally, the ability to employ stratified sampling methods allows researchers to capture a representative cross-section of the population, thereby minimizing sampling bias and enhancing the reliability of the findings. For example, the National Health Interview Survey conducted by the Centers for Disease Control and Prevention utilizes sophisticated sampling techniques to obtain reliable estimates about the health status of the U. S. population (CDC, 2022). Furthermore, surveys can be adapted to track health issues over time, which is particularly relevant for longitudinal studies examining the impacts of public health interventions.

Moreover, surveys are instrumental in engaging communities and empowering individuals by giving them a voice in health research. By soliciting feedback on community needs and experiences, researchers can tailor health programs more effectively and ensure that interventions are culturally competent (O'Cathain *et al.*, 2019). This engagement fosters trust and cooperation, which are vital for successful implementation of health initiatives. Survey research is integral to health research due to its efficiency, adaptability, and capability to enhance community engagement. As public health challenges continue to evolve, employing survey methodologies will remain essential for understanding health dynamics and informing policy decisions.

To explore these issues further, a structured survey method was employed using a questionnaire that targets key stakeholders in Saudi healthcare institutions. Through overcoming barriers related to privacy, cost, and training, Saudi Arabia can leverage EHRs to significantly improve its healthcare landscape. A well-structured survey provides valuable insights that can guide future decisions regarding EHR systems.

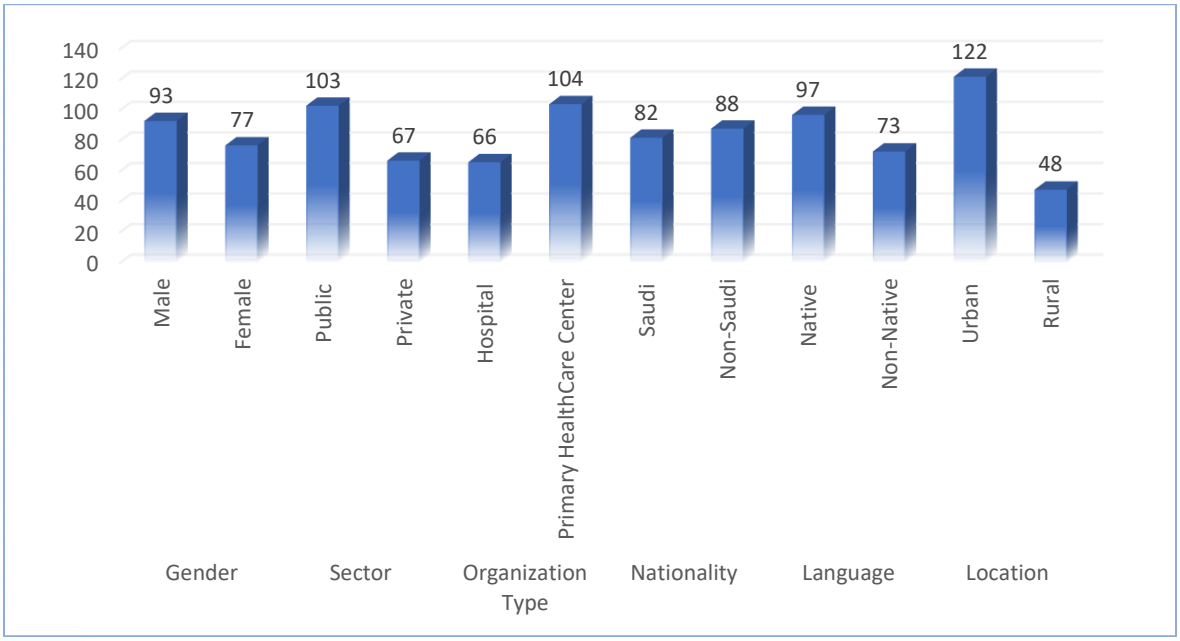
The survey encompassed healthcare administrators, physicians, nurses, and selected patients. The questionnaire was designed to assess perceptions of the advantages of EHRs, the challenges faced in implementation, and the impact on healthcare quality. Each stakeholder group was strategically sampled to ensure a comprehensive understanding of different perspectives within the healthcare setting. While the prospects of implementing EHRs in Saudi healthcare institutions are promising, particularly in enhancing healthcare quality, significant challenges must be addressed.

Results and Findings

Table 1
Demographic Information

Variables	Characteristics	n	%
Gender	Male	93	54.7
	Female	77	45.29
Sector	Public	103	61
	Private	67	39
Organization Type	Hospital	66	38.82
	Primary HealthCare Center	104	61.17
Nationality	Saudi	82	48.23
	Non-Saudi	88	51.76
Language	Native	97	57.05
	Non-Native	73	42.94
Location	Urban	122	71.7
	Rural	48	28.23

Figure 1
Demographic Information



170 completed questionnaires were received and used in the analysis. Majority of the respondents were male i.e., 54.7% followed by the female respondents i.e. 45.2%. regarding sector most of the respondents were form public sector health organizations i.e., 61% and 39% from private sector. Respondents form PHCCs were 61% and form hospitals 39%. Most of the non-Saudi participated in the survey i.e., 51.7%. regarding language (Saudi and non-Saudi Arabic speakers) were 57%. 71.7% belong to urban areas. Table 1 Figure 1.

Table 2
Mean S.D, Correlation and Reliability

Variable	Mean	1	2	3	4	5	6	7	8	α	AVE
DPSC	4.23	1								0.702	0.563
II	3.99	0.523	1							0.798	0.524
RTC	3.65	0.468	0.367	1						0.815	0.612
HIC	4.21	0.632	0.498	0.427	1					0.783	0.627
IDAS	4.89	0.413	0.324	0.523	0.621	1				0.922	0.736
EPS	4.91	0.221	0.426	0.524	0.620	0.726	1			0.894	0.789
SWE	3.63	0.450	0.413	0.531	0.621	0.823	0.456	1		0.866	0.814
PFO	3.55	0.557	0.428	0.528	0.612	0.924	0.688	0.821	1	0.746	0.833

* Significant at 0.05; ** Significant at 0.01

Table 2 presents the mean, correlation, Cronbach alpha and average variance extracted (AVE). study find significant and positive association among all the dependent and independent variables. Likewise, minimum average was recorded for 3.55 PFO whereas, 4.91 recorded for EPS. As far values of Cronbach alpha are concerned all the values were above the 0.70 which indicates that the instrument used for data collection was reliable and accurate in getting the responses. For AVE threshold is 0.50 (Hair et al. 2017), Table 2 shows all the AVEs of all respective constructs are above the threshold value. Therefore, it established convergent validity of the scale.

Table 3

Regression Analysis

DV	IV	R^2	F	β	p
Prospects EHR	Constant	0.785	4236.987		0.000
	DPSC			0.560	0.000
	II			0.422	0.000
	RTC			0.639	0.000
	HIC			0.784	0.000

Multiple regression analysis was run in SPSS 30. Table 3 give a bird eye view of the impact of independent variables on the dependent variables. DPSC, II, RTC and HIC have explained 78.5% variance on prospects in electronic health records, with goodness of fit F= 4236.987, p<0.01. one unit change in DPSC could possibly change prospects in HER up to 56%, whereas II 42%, RTC 63.9% and HIC 78.4%, HIC emerged as most dominant construct in the model predicting prospects in HER. Able 3.

Discussion and Conclusion

The implementation of EHRs in Saudi Arabia has the potential to significantly enhance the quality of care by improving data accessibility, patient safety, and clinical decision-making. However, the challenges associated with EHRs, such as data privacy concerns, interoperability issues, and resistance to change, must be addressed to fully realize their potential. Policymakers, healthcare providers, and technology developers must work together to develop strategies that address these challenges and ensure the successful adoption of EHRs in Saudi Arabia.

The implementation of electronic health records (EHRs) in Saudi healthcare institutions presents both prospects and challenges, greatly influencing the quality of healthcare services. EHR systems have the potential to enhance patient care by improving data accessibility, increasing efficiency, and fostering better communication among healthcare providers. In Saudi Arabia, the government has been actively encouraging this transition to digital health, aligning with Vision 2030, which aims for improved healthcare delivery through technological advancements.

A key prospect of EHRs is their ability to store comprehensive and accurate patient information that is accessible to all authorized healthcare providers. This centralization of data can lead to improved patient outcomes, as studies indicate that timely access to patient history significantly influences clinical decision-making (Alkhaldi *et al*., 2019). In addition, EHRs facilitate better coordination among various healthcare facilities, reducing the risks of duplicated tests and unnecessary treatments, consequently enhancing the healthcare system's efficiency (AlHaqwi *et al*., 2020). Moreover, EHRs have been associated with improved patient engagement through patient portals that allow individuals to access their health information, schedule appointments, and communicate with healthcare providers. A recent study indicated that Saudi patients who utilized these portals reported higher satisfaction with their healthcare experience (Alhuwail *et al*., 2021). The potential for data analytics within EHRs can also lead to population health management by identifying trends and helping to create targeted health interventions (Alharbi *et al.,* 2020).

Despite these prospects, the adoption of EHRs in Saudi Arabia is not without challenges. One significant barrier is the resistance to change from healthcare professionals who may prefer traditional paper-based systems (Albar *et al.*, 2023). There is also the concern regarding data privacy and security, as sensitive patient information can be vulnerable to breaches if not adequately protected. Ensuring compliance with regulations and maintaining patient confidentiality are paramount in fostering trust in EHR systems (Alzahrani *et al*., 2022).

In addition, the cost of implementing EHR systems can be high, especially for smaller healthcare facilities, leading to disparities in how technology is adopted across regions (Al-Drees *et al*., 2023). To address these challenges, ongoing training for healthcare staff and investment in robust cybersecurity measures are necessary. The integration of electronic health records in Saudi healthcare institutions holds significant promise for improving the quality of care. However, it is imperative to address the accompanying challenges to fully realize these benefits. Effective training, regulatory frameworks, and sustained investment are essential in overcoming barriers and ensuring a successful transition to EHRs.

EHRs represent a significant opportunity to improve the quality of care in Saudi Arabia's healthcare system. By addressing the challenges associated with their implementation, the Kingdom can leverage EHRs to achieve its Vision 2030 goals and provide high-quality, patient-centered care. However, this will require a concerted effort from all stakeholders, including policymakers, healthcare providers, and technology developers.

Limitations

This study has several limitations. First, it is based on a review of existing literature and does not include primary data collection. Second, the focus is on the Saudi Arabian context, which may limit the generalizability of the findings to other countries. Finally, the rapid pace of technological advancement means that some of the challenges identified in this study may be addressed soon.

Future Research Directions

Future research should focus on evaluating the impact of EHRs on patient outcomes in Saudi Arabia, particularly in the context of chronic disease management. Additionally, studies should explore the effectiveness of different strategies for overcoming the challenges associated with EHR implementation, such as training programs for healthcare professionals and policies to promote interoperability.

Acknowledgments

The authors are highly thankful to their colleague, fellows, and respondents for their corporation, pointing out the weakness and suggestion for improvement inter alia filling and returning the survey questionnaires within the stipulated timeframe.

Data Availability

The data related to this study could be available to the interested audience upon formal request.

Declaration of Interest

The authors declare that they have no clash of interest.

References

Albar, A., Alawad, A., & Al-Shammari, M. (2023). Resistance to change in healthcare: The case of electronic health records in Saudi Arabia. *Journal of Healthcare Management*, 68(1), 1-12.

Al-Drees, A., Farooq, A., & Al-Shehri, M. (2023). Challenges in implementing electronic health records in Saudi Arabia: A systematic review. *Journal of Medical Systems*, 47(2), 1-15.

AlFadhli, S. (2022). Data privacy and security in E-Health: Challenges and solutions in Saudi Arabia. *Saudi Journal of Health Sciences*, 11(2), 56-62.

AlHaqwi, A. I., Alshahrani, A. K., & Altuwaijri, M. M. (2020). Enhancing healthcare in Saudi Arabia through electronic health records. *Journal of King Saud University - Medical Sciences*, 33(3), 301-308.

Alharbi, F. M., Alqahtani, N. M., & Alzahrani, S. H. (2020). The impact of EHRs on improving patient care in Saudi Arabia healthcare settings. *International Journal of Health Services*, 50(2), 223-230.

Alharbi, N. S., Alsubki, N., & Alotabi, F. M. (2020). The impact of electronic health records on patient safety: A systematic review. *Journal of Healthcare Quality Research*, 35(4), 231-238.

Alharthi, S., Alshahrani, M., & Biyun, A. (2021). Barriers to the implementation of electronic health records in Saudi Arabia: A systematic review. *International Journal of Medical Informatics*, 148, 104396.

Alhussain, T., Alturki, N., & Khan, M. (2021). The role of electronic health records in enhancing healthcare quality in the Middle East. *Journal of Health Informatics*, 9(1), 22-31.

Alhuwail, D., Alharthi, S., & Othman, A. (2021). Patients' perceptions of EHRs in Saudi Arabia: A qualitative study. *Health Informatics Journal*, 27(1), 1-10.

Alhuwail, D., Koru, G., & Alhuwail, M. (2020). Challenges and opportunities for implementing electronic health records in the United Arab Emirates. *Health Policy and Technology*, 9(2), 153-159.

Alkhaldi, A., Alghamdi, H., & Alhazmi, M. (2019). Factors affecting the adoption of electronic health records in Saudi healthcare institutions. *Journal of Healthcare Engineering*, 2019, 1-8.

Alkraiji, A., Jackson, T., & Murray, I. (2021). Barriers to the adoption of electronic health records in Saudi Arabia: A qualitative study. *Journal of Health Informatics in Developing Countries*, 15(1), 1-12.

Almalki, M., Fitzgerald, G., & Clark, M. (2021). Health care system in Saudi Arabia: An overview. *Eastern Mediterranean Health Journal*, 27(3), 255-261.

Almazroa, A., Alotaibi, S., & Almutairi, A. (2021). Data privacy and security in electronic health records: A review of the literature. *Journal of Information Security and Applications*, 58, 102-110.

Alzahrani, A., Alhamad, A., & Alshehri, M. (2022). Data security and privacy concerns in the implementation of electronic health records in Saudi Arabia. *Journal of Global Health*, 12, 1-10.

Biyun, A. (2021). The role of electronic health records in enhancing patient-centered care: Evidence from Saudi Arabia. *Health Information Management Journal*, 50(1), 12-18.

CDC. (2022). *National Health Interview Survey*. Retrieved from https://www.cdc.gov/nchs/nhis/index.htm

Hassey, A., Reilly, M., & McGowan, A. (2020). Impact of electronic health records on quality of care and safety. *Journal of the Saudi Heart Association*, 32(2), 120-125.

Khan, A. R., Alhajri, H. M., & Al-Khaldi, Y. (2021). Challenges in the implementation of electronic health records in Saudi Arabia: A review of the literature. *International Journal of Healthcare Management*, 14(4), 237-248.

O'Cathain, A., Croot, L., Hardey, M., & Huey, G. (2019). An inductive framework for developing and evaluating complex interventions: The role of qualitative research. *BMC Medical Research Methodology*, 19(1), 1-11.

Paltiel, A. D., Zheng, A., & Zheng, A. (2021). Assessment of SARS-CoV-2 Vaccine Acceptance in the United States. *JAMA Network Open*, 4(3), e215878.

Tulu, B., Omer, M., & Melaku, T. (2020). Electronic health records and their impact on patient care: A Nigerian perspective. *Nigerian Journal of Clinical Practice*, 23(5), 742-748.

Wright, K. B. (2020). Researching Internet-Based Populations: Advantages and Disadvantages of Online Surveys. *Journal of Communication*, 70(4), 766-784.

Zain, A., Jamal, A., & Ibrahim, I. (2020). Investigating the barriers to the effective adoption of electronic health records in Saudi Arabian hospitals. *Journal of Medical Systems*, 44(5), 90.

Note: **Open Access Public Health and Health Administration Review** is recognized by the Higher Education Commission Pakistan in the Y category.

Disclaimer/ Publisher's Note: The statements, opinions, and data contained in all publications in this journal are solely those of the individual author(s) and not of the MDPIP and/ or the editor(s). MDPIP and editor(s) disclaim responsibility for any injury to the people or property resulting from any ideas, methods, instructions, or products referred to *in the content.*