

ELECTRONIC HEALTH RECORDS AND HEALTHCARE QUALITY IN NIGERIA: A NARRATIVE REVIEW OF BENEFITS, CHALLENGES, AND POLICY IMPLICATIONS

Matthias Chibuzo Onyema

Department of Sociology, Criminology and Security Studies, Achievers University, Owo, Ondo
State, Nigeria

*onyema.mc@achievers.edu.ng

ABSTRACT: Electronic Health Records (EHRs) have become central to contemporary healthcare reform because they improve the storage, retrieval, sharing, and use of patient information. In Nigeria, where healthcare delivery is frequently constrained by weak infrastructure, fragmented records, limited workforce capacity, and uneven data quality, EHRs offer significant opportunities for improving clinical decision-making, patient safety, care coordination, and health system planning. This paper adopts a narrative review method to examine the role of EHRs in improving healthcare quality in Nigeria. Although relevant scholarly literature and policy-oriented sources on EHR adoption, digital health, health information systems, and healthcare quality were reviewed and thematically synthesized. The review shows that EHRs can enhance healthcare quality by improving access to patient records, reducing documentation errors, supporting continuity of care, strengthening health data management, and enabling evidence-informed policy decisions. However, the effective adoption of EHRs in Nigeria remains limited by inadequate digital infrastructure, high implementation costs, poor interoperability, insufficient training, data security concerns, and resistance to technological change among healthcare workers. Using the socio-technical approach as its theoretical lens, the paper argues that successful EHR implementation requires more than technological investment; it also demands attention to users, institutions, workflows, policy frameworks, and organizational culture. The paper concludes that EHRs can significantly improve healthcare quality in Nigeria if implementation is supported by sustainable funding, workforce training, interoperability standards, cybersecurity safeguards, and context-sensitive digital health policies.

Keywords: Electronic Health Records; Healthcare Quality; Digital Health; Health Information Systems; Health Informatics; Nigeria

INTRODUCTION

The digital transformation of healthcare has become a defining feature of contemporary health systems across the world. Central to this transformation is the adoption of Electronic Health Records (EHRs), which facilitate the electronic creation, storage, retrieval, and exchange of patient information across healthcare institutions. EHRs are increasingly recognized as critical tools for improving healthcare quality through enhanced clinical decision-making, reduction of medical errors, improved continuity of care, efficient health information management, and evidence-based policy development. Consequently, governments, healthcare organizations, and international

development agencies have invested heavily in digital health technologies as part of broader efforts to strengthen healthcare systems and achieve universal health coverage (World Health Organization [WHO], 2021). Recent studies indicate that EHRs contribute significantly to healthcare efficiency, patient safety, and service quality, particularly in health systems seeking to overcome longstanding challenges associated with fragmented medical records and poor information management (Harerimana et al., 2025; Olukorode et al., 2024).

From the standpoint of medical sociology, however, healthcare technologies are not merely technical innovations but social systems embedded within organizational structures, professional cultures, institutional practices, and broader relations of power. Medical sociologists have consistently argued that the impact of technological innovations depends not only on their technical capabilities but also on the social environments within which they are introduced and utilized. Consequently, debates concerning digital health technologies increasingly focus on the interaction between technological change, professional practice, organizational behaviour, and healthcare outcomes. While proponents of EHRs emphasize their potential to improve healthcare quality and efficiency, critics caution that technological systems may also create new forms of administrative burden, intensify workplace surveillance, alter professional autonomy, and reproduce existing inequalities within healthcare institutions. These competing perspectives suggest that the effectiveness of EHRs cannot be understood solely through technological considerations but must be examined within the broader socio-organizational contexts that shape healthcare delivery.

These debates are particularly significant in low- and middle-income countries where healthcare systems continue to confront severe resource constraints and infrastructural deficiencies. Across many developing countries, EHRs have been promoted as mechanisms for improving health system performance, strengthening accountability, enhancing data quality, and facilitating evidence-based healthcare planning. Nevertheless, the implementation of digital health technologies in such contexts remains uneven. Studies have shown that inadequate technological infrastructure, unreliable electricity supply, poor internet connectivity, insufficient funding, low digital literacy, and workforce shortages frequently limit the effectiveness of EHR systems (Egwudo et al., 2025; Adedeji et al., 2022). Consequently, there remains considerable scholarly interest in understanding the conditions under which digital technologies can meaningfully improve healthcare quality in resource-constrained settings.

Nigeria presents a particularly important case within these discussions. Despite possessing one of the largest healthcare systems in Africa, the country continues to face substantial challenges relating to healthcare access, workforce capacity, health information management, and service delivery. Many healthcare facilities still depend heavily on paper-based record systems characterized by duplication, information loss, delayed retrieval, poor coordination, and limited accessibility. Such deficiencies often undermine clinical decision-making, compromise continuity of care, weaken disease surveillance mechanisms, and impede effective healthcare planning. In response to these challenges, various digital health initiatives have promoted the adoption of EHRs as a means of strengthening healthcare quality and improving patient outcomes. Evidence from recent studies suggests that EHR implementation in Nigeria has improved healthcare data quality, enhanced patient record management, and strengthened healthcare coordination in facilities where digital systems have been successfully deployed (Olukorode et al., 2024; Aniekwe et al., 2023).

Despite these promising developments, significant challenges continue to hinder the widespread adoption and effective utilization of EHRs within the Nigerian healthcare system. Financial constraints, inadequate infrastructure, limited interoperability between systems, insufficient training opportunities, cybersecurity concerns, and resistance to organizational change remain persistent barriers to implementation (Adedeji et al., 2022). More importantly, existing scholarship on EHRs in Nigeria remains fragmented. While some studies focus on technological infrastructure and implementation challenges, others examine healthcare outcomes, policy issues, or adoption patterns. Consequently, there is limited integrative analysis of how EHRs contribute to healthcare quality within the broader social, organizational, and institutional realities that characterize healthcare delivery in Nigeria. Furthermore, relatively little attention has been devoted to examining EHR adoption through the analytical lens of medical sociology, which emphasizes the interconnectedness of technology, professional practice, institutional structures, and healthcare outcomes.

This gap in the literature raises important questions concerning the role of EHRs in improving healthcare quality within the Nigerian healthcare system. To what extent do EHRs contribute to healthcare quality improvement in Nigeria? What benefits have been associated with EHR adoption in healthcare institutions? What challenges continue to impede the effective implementation and utilization of EHR systems? What policy and institutional measures are necessary for maximizing the potential of EHRs in improving healthcare delivery and patient outcomes? Addressing these questions is important not only for understanding the effectiveness of digital health technologies but also for informing healthcare policy, institutional reforms, and future digital transformation initiatives.

Against this background, this study undertakes a narrative review of the role of Electronic Health Records in improving healthcare quality in Nigeria. Specifically, the study seeks to examine the evolution and adoption of EHRs, assess their contributions to healthcare quality, identify the major challenges affecting their implementation, and explore policy measures capable of enhancing their effectiveness within the Nigerian healthcare system. Drawing upon the socio-technical perspective, the paper argues that successful EHR implementation depends not only on technological infrastructure but also on the interaction between healthcare professionals, organizational structures, institutional capacities, and policy environments. By synthesizing existing literature from a medical sociological perspective, the study contributes to ongoing debates concerning digital transformation, healthcare quality, and health system development in contemporary Africa.

METHODOLOGY

This study adopts a narrative review design to examine the role of Electronic Health Records (EHRs) in improving healthcare quality in Nigeria. A narrative review was considered appropriate because it allows for the synthesis and critical evaluation of existing scholarly literature on a subject that spans multiple disciplines, including medical sociology, health informatics, public health, and healthcare management (Abbas & Michael, 2021). Unlike empirical studies that rely on primary data collection, narrative reviews draw upon existing knowledge to identify key themes, debates, trends, and gaps in the literature.

Relevant literature was sourced from reputable academic databases, including Google Scholar, PubMed, Scopus, Web of Science, and ScienceDirect. The search focused on publications relating to Electronic Health Records, healthcare quality, digital health, health information systems, medical informatics, and EHR adoption in Nigeria and other developing countries. Key search terms included “Electronic Health Records,” “Electronic Medical Records,” “Healthcare Quality,” “Digital Health,” “Health Information Systems,” “EHR Adoption in Nigeria,” and “Health Informatics in Africa.” To ensure currency and relevance, priority was given to peer-reviewed journal articles, institutional reports, and policy documents published between 2021 and 2026, although a limited number of seminal works were retained to provide historical and theoretical context.

The collected literature was subjected to thematic analysis. Studies were reviewed and organized around major themes, including the evolution of EHRs, healthcare quality improvement, benefits of EHR adoption, implementation challenges, and policy implications for Nigeria. Through this process, the study critically synthesizes existing evidence and identifies the socio-technical factors influencing the effectiveness of EHR systems in improving healthcare quality within the Nigerian healthcare system.

Inclusion and Exclusion Criteria

To ensure the credibility and relevance of the review, explicit inclusion and exclusion criteria were applied during source selection. Included sources comprised peer-reviewed journal articles, scholarly books, authoritative institutional reports, and policy documents published primarily between 2021 and 2026 that addressed Electronic Health Records, healthcare quality, digital health, health information systems, or EHR implementation within Nigeria or comparable low- and middle-income countries. Seminal publications published before 2021 were retained where they provided foundational theoretical or historical insights into the evolution of EHRs and the socio-technical approach. Sources were excluded if they were conference abstracts, unpublished manuscripts, dissertations, opinion pieces, newspaper articles, commercial websites, duplicate publications, or studies whose primary focus was unrelated to Electronic Health Records or healthcare quality. Following the application of these criteria, the selected literature was critically reviewed and synthesized thematically to identify recurring patterns, debates, and evidence relevant to the study objectives.

LITERATURE REVIEW

Conceptualizing Electronic Health Records and Healthcare Quality

Electronic Health Records (EHRs) have emerged as one of the most significant innovations in contemporary healthcare systems. They represent the transition from paper-based medical record systems to digitally managed health information infrastructures designed to facilitate the storage, retrieval, sharing, and utilization of patient information across healthcare settings. Although the concepts of Electronic Medical Records (EMRs) and Electronic Health Records are sometimes used interchangeably, scholars generally distinguish between the two. Electronic Medical Records are digital versions of patient records maintained within a single healthcare facility, whereas Electronic

Health Records are broader systems that allow information exchange across multiple healthcare institutions and healthcare providers (Häyrynen et al., 2008). Consequently, EHRs are regarded as more comprehensive tools for supporting continuity of care, interdisciplinary collaboration, and integrated healthcare delivery.

Contemporary scholarship increasingly views EHRs not merely as technological databases but as socio-technical systems that connect healthcare professionals, patients, institutions, and information infrastructures. This perspective reflects broader developments within medical sociology and science and technology studies, which emphasize that healthcare technologies derive their meaning and effectiveness from the social contexts in which they operate. According to socio-technical scholars, the success of digital health innovations depends not only on technological sophistication but also on organizational culture, professional acceptance, institutional support, and user competence. Thus, EHR implementation involves both technical transformation and organizational change.

The growing prominence of EHRs has coincided with increased scholarly interest in healthcare quality. Healthcare quality generally refers to the degree to which healthcare services improve desired health outcomes and conform to established professional standards. The World Health Organization (2021) identifies effectiveness, safety, timeliness, efficiency, equity, and people-centeredness as core dimensions of healthcare quality. Similarly, the Institute of Medicine conceptualizes quality healthcare as care that is safe, effective, patient-centered, timely, efficient, and equitable. These dimensions provide a useful framework for assessing the potential contribution of EHRs to healthcare delivery.

Within the healthcare quality literature, EHRs are frequently presented as mechanisms for improving clinical effectiveness and patient safety. By providing healthcare professionals with timely access to comprehensive patient information, EHRs reduce the likelihood of diagnostic errors, medication conflicts, and information loss. Digital record systems also facilitate communication among healthcare providers, thereby improving care coordination and continuity of treatment. Recent studies indicate that healthcare facilities utilizing well-designed EHR systems often report improvements in documentation accuracy, clinical workflow efficiency, patient monitoring, and healthcare planning (Olukorode et al., 2024; Aniekwe et al., 2023).

Nevertheless, medical sociologists caution against viewing technological innovation as an automatic solution to healthcare challenges. Technological determinist perspectives assume that digital systems inherently improve organizational performance. However, sociological analyses emphasize that healthcare quality outcomes depend on how technologies are integrated into existing institutional structures and professional practices. EHR systems may improve information accessibility while simultaneously generating new administrative burdens, increasing documentation requirements, and altering professional autonomy. Consequently, the relationship between EHR adoption and healthcare quality remains contingent upon organizational capacity, user acceptance, regulatory frameworks, and broader socio-economic conditions.

The conceptual relationship between EHRs and healthcare quality is therefore neither linear nor deterministic. Rather, it reflects a dynamic interaction between technology, healthcare institutions,

professional actors, and policy environments. Understanding this interaction is particularly important in developing countries where infrastructural limitations and institutional constraints often shape the effectiveness of digital health innovations. Within the Nigerian context, where healthcare delivery continues to face challenges relating to resource shortages, fragmented information systems, and uneven access to healthcare services, EHRs offer considerable potential for improving healthcare quality. However, the realization of this potential depends on addressing the social, organizational, and technological factors that influence implementation and utilization.

Evolution of Electronic Health Records: From Medical Informatics to Digital Health Systems

The development of Electronic Health Records (EHRs) reflects broader transformations in healthcare administration, information management, and medical practice that have occurred over the past six decades. The emergence of EHRs was driven by the growing recognition that traditional paper-based record systems were increasingly inadequate for managing the expanding volume and complexity of healthcare information. As healthcare systems became more specialized and patient care increasingly involved multiple providers and institutions, the need for more efficient methods of storing, retrieving, and sharing medical information became apparent.

The origins of EHRs can be traced to the early development of medical informatics in the 1960s when healthcare institutions in the United States and Europe began experimenting with computerized methods of managing patient information. Early efforts focused primarily on administrative data processing and hospital information systems designed to improve record keeping and operational efficiency. These pioneering systems demonstrated the potential of digital technologies to support healthcare delivery, although their functionality remained limited by the technological capabilities of the period (Shortliffe & Cimino, 2014). During the 1970s and 1980s, advances in computing technology facilitated the development of more sophisticated electronic record systems capable of storing clinical information, laboratory results, diagnostic reports, and treatment histories. These innovations laid the foundation for the modern EHR systems that are widely used today (Collen, 1995).

The expansion of EHR adoption during the 1990s and early 2000s coincided with growing concerns regarding healthcare quality, patient safety, and healthcare costs. Policymakers and healthcare organizations increasingly viewed health information technologies as instruments for reducing medical errors, improving efficiency, and strengthening accountability. The publication of influential reports such as *To Err is Human* and *Crossing the Quality Chasm* by the Institute of Medicine highlighted the importance of information systems in enhancing healthcare quality and reducing preventable adverse events. Consequently, governments across many developed countries introduced policies and financial incentives designed to accelerate the adoption of EHR systems within healthcare institutions (Institute of Medicine, 2001; Institute of Medicine, 2003).

The evolution of EHRs has also been shaped by broader developments in digital health and health information exchange. Contemporary EHR systems differ significantly from earlier electronic record systems because they increasingly support interoperability, real-time data exchange, clinical decision support, telemedicine integration, and population health management. Advances in cloud computing, artificial intelligence, mobile health technologies, and data analytics have expanded the

functional capabilities of EHRs beyond simple record storage. Modern EHR systems now serve as critical infrastructures for healthcare coordination, disease surveillance, healthcare planning, and evidence-based decision-making (WHO, 2021). Consequently, EHRs have become central components of digital health ecosystems that seek to improve healthcare quality, accessibility, and efficiency.

From a medical sociological perspective, the evolution of EHRs reflects more than technological progress. It also represents changing forms of organizational control, professional practice, and information governance within healthcare institutions. Scholars have observed that digital record systems reshape relationships between healthcare professionals, patients, administrators, and policymakers by altering how information is produced, accessed, and utilized. While EHRs facilitate greater standardization and accountability, they may also increase documentation requirements, introduce new forms of workplace monitoring, and transform professional decision-making processes. Thus, the historical development of EHRs illustrates the complex interplay between technological innovation and social organization within healthcare systems.

The emergence of EHRs in Africa has largely occurred within the broader context of health sector reforms and digital transformation initiatives aimed at strengthening healthcare systems. Many African countries have adopted digital health technologies to address challenges associated with fragmented health information systems, weak data management practices, and limited healthcare resources. However, implementation experiences across the continent have been uneven due to persistent infrastructural deficiencies, inadequate funding, workforce shortages, and regulatory challenges. Despite these obstacles, digital health initiatives have increasingly been recognized as important mechanisms for improving healthcare quality and supporting health system development.

Nigeria's experience with EHR adoption reflects both the opportunities and challenges associated with digital transformation in developing healthcare systems. Historically, healthcare institutions in Nigeria relied predominantly on paper-based record systems that were often characterized by inefficiency, duplication, poor accessibility, and data management challenges. As healthcare delivery became more complex and the demand for reliable health information increased, policymakers and healthcare administrators began exploring digital solutions to improve record management and service delivery. The introduction of various digital health initiatives, including electronic medical records, hospital information systems, and health management information systems, marked important steps toward modernizing healthcare administration within the country.

Recent studies suggest that EHR adoption in Nigeria has contributed to improvements in healthcare data quality, patient information management, and service coordination in facilities where implementation has been successful (Olukorode et al., 2024). Furthermore, government-led initiatives promoting digital health have sought to strengthen healthcare information systems and enhance evidence-based planning within the health sector. Nevertheless, the diffusion of EHRs across Nigeria remains uneven. Many healthcare facilities continue to face significant barriers relating to infrastructure, funding, interoperability, technical support, and workforce preparedness. Consequently, the Nigerian experience demonstrates that technological innovation alone is insufficient for healthcare transformation. Rather, the effectiveness of EHRs depends upon the

interaction between technology, institutions, professional actors, and broader socio-economic conditions.

The evolution of EHRs from simple electronic record systems to integrated digital health platforms underscores their growing importance within contemporary healthcare systems. However, the historical experience of EHR implementation also demonstrates that healthcare technologies achieve their intended outcomes only when supported by appropriate organizational structures, policy frameworks, and institutional capacities. This insight is particularly relevant for Nigeria, where ongoing efforts to expand EHR adoption must address both technological and socio-organizational challenges in order to realize meaningful improvements in healthcare quality.

Electronic Health Records and Healthcare Quality: Theoretical and Empirical Perspectives

The relationship between Electronic Health Records (EHRs) and healthcare quality has attracted considerable scholarly attention within health informatics, public health, healthcare management, and medical sociology. At the centre of this interest is the expectation that digital health technologies can contribute to safer, more efficient, and more patient-centred healthcare systems. Nevertheless, the extent to which EHRs improve healthcare quality remains the subject of ongoing theoretical and empirical debate. While many studies report positive outcomes associated with EHR implementation, others caution that technological adoption alone does not automatically translate into improvements in healthcare delivery. Understanding these competing perspectives is particularly important for developing countries where healthcare systems often operate under significant institutional and resource constraints.

Theoretically, EHRs are expected to improve healthcare quality by enhancing the availability, accessibility, accuracy, and usability of patient information. Healthcare quality frameworks developed by the World Health Organization (2021) and the Institute of Medicine identify safety, effectiveness, efficiency, timeliness, patient-centredness, and equity as core dimensions of quality healthcare. EHRs potentially contribute to each of these dimensions. Through real-time access to patient records, healthcare providers can make more informed clinical decisions, reduce duplication of diagnostic procedures, minimize medication errors, and improve continuity of care. Digital records also facilitate communication among healthcare professionals, thereby strengthening coordination across different levels of healthcare delivery.

From a socio-technical perspective, however, the impact of EHRs on healthcare quality depends on more than technological functionality. The socio-technical approach argues that healthcare outcomes emerge from interactions between technological systems and social environments. Consequently, successful EHR implementation requires alignment between technology, organizational culture, institutional structures, professional practices, and user capabilities. This perspective challenges technologically deterministic assumptions that digital systems automatically generate efficiency and quality improvements. Instead, it suggests that healthcare technologies produce different outcomes depending on the contexts within which they are deployed.

Empirical evidence from developed healthcare systems generally supports the view that EHRs contribute positively to healthcare quality. Studies conducted in North America and Europe

consistently report improvements in patient safety, documentation quality, clinical efficiency, and care coordination following EHR implementation. Menachemi and Collum (2011) argue that EHR systems improve the accessibility of patient information, reduce paperwork, and facilitate evidence-based clinical practice. Similarly, Bates and Gawande (2003) demonstrate that computerized clinical information systems contribute significantly to the reduction of medication errors and adverse medical events. More recent studies have shown that integrated EHR systems support population health management, chronic disease monitoring, and healthcare quality assessment by enabling the systematic collection and analysis of health data.

One of the most widely documented benefits of EHRs relates to patient safety. Medical errors remain a significant cause of preventable morbidity and mortality worldwide. EHRs reduce the likelihood of such errors by providing healthcare professionals with complete and up-to-date patient information, automated alerts, and decision-support tools. Electronic prescribing systems, for example, help prevent medication interactions and dosage errors, while integrated laboratory reporting systems improve diagnostic accuracy and clinical decision-making. Through these mechanisms, EHRs contribute directly to safer healthcare delivery.

EHRs have also been associated with improvements in healthcare efficiency. Traditional paper-based record systems often require extensive administrative effort for documentation, retrieval, and storage of patient information. By contrast, electronic systems streamline these processes and facilitate faster access to medical records. Improved information accessibility can reduce waiting times, accelerate clinical workflows, and support more efficient use of healthcare resources. Furthermore, EHRs enable healthcare institutions to generate performance indicators and quality metrics that support organizational learning and continuous quality improvement.

Despite these documented benefits, critical scholarship has identified several limitations and unintended consequences associated with EHR implementation. Some studies report that EHR systems may increase documentation burdens, contribute to clinician fatigue, and reduce the amount of time healthcare professionals spend interacting directly with patients. The growing concern regarding physician burnout has been linked partly to the administrative demands associated with electronic documentation requirements. Medical sociologists argue that these developments illustrate how technological innovations can simultaneously improve efficiency while generating new forms of workplace pressure and professional dissatisfaction.

Concerns regarding surveillance and professional autonomy have also emerged within sociological analyses of EHR systems. Digital records create extensive documentation trails that allow administrators, regulators, and healthcare organizations to monitor professional activities more closely than was possible under paper-based systems. While such monitoring may enhance accountability and quality assurance, it may also alter professional discretion and reshape power relationships within healthcare institutions. Consequently, some scholars argue that EHRs function not only as clinical tools but also as mechanisms of organizational governance and institutional control.

The challenges associated with EHR implementation become even more pronounced in developing countries where healthcare systems often face infrastructural and resource limitations. Research

from Africa, Asia, and Latin America suggests that while EHRs have considerable potential to improve healthcare quality, implementation outcomes often vary with local institutional conditions. Factors such as unreliable electricity supply, poor internet connectivity, inadequate technical support, limited funding, and insufficient workforce training often undermine the effective utilization of digital health technologies. As a result, the anticipated benefits of EHRs are not always fully realized.

Within the African context, recent studies increasingly highlight the importance of contextual factors in shaping EHR outcomes. Harerimana et al. (2025) found that healthcare workers' acceptance of EHR systems is strongly influenced by perceptions of usefulness, ease of use, organizational support, and technological competence. Similarly, studies across sub-Saharan Africa demonstrate that healthcare institutions with stronger leadership support, adequate infrastructure, and sustained training programmes are more likely to achieve successful EHR implementation. These findings reinforce the socio-technical argument that technological systems cannot be separated from the organizational environments within which they operate.

Nigeria provides a particularly revealing case for examining these issues. Existing evidence suggests that EHR adoption has generated measurable improvements in healthcare information management and service delivery in several Nigerian healthcare institutions. Olukorode et al. (2024) report that electronic medical record systems have significantly enhanced data quality, record accessibility, and information management processes within healthcare facilities. Aniekwe et al. (2023) similarly found that electronic health information exchange systems improved the completeness and validity of healthcare data used for monitoring viral load testing and treatment outcomes.

However, the literature also reveals persistent barriers that limit the contribution of EHRs to healthcare quality in Nigeria. Adedeji et al (2022) identify infrastructural deficiencies, inadequate funding, limited technical capacity, and organizational resistance as major obstacles to successful implementation. Other studies highlight concerns relating to data privacy, cybersecurity, interoperability, and workforce preparedness. These challenges suggest that while EHRs possess substantial potential to improve healthcare quality, their effectiveness remains dependent upon broader institutional and socio-economic conditions.

Overall, the literature demonstrates that EHRs can contribute significantly to healthcare quality through improved patient safety, enhanced efficiency, better care coordination, and stronger health information management. However, the evidence also indicates that technological adoption alone is insufficient for achieving these outcomes. Rather, the effectiveness of EHR systems depends upon the interaction between technological infrastructure, organizational capacity, professional practice, policy frameworks, and user acceptance. This insight is particularly relevant in Nigeria, where efforts to expand digital health technologies must address both technical and socio-organizational barriers if meaningful improvements in healthcare quality are to be achieved.

Electronic Health Record Adoption in Nigeria: Benefits, Challenges, and Emerging Policy Directions

The adoption of Electronic Health Records (EHRs) in Nigeria has gained increasing attention as part of broader efforts to modernize healthcare delivery and strengthen health system performance. The growing demand for efficient healthcare services, improved data management, and evidence-based decision-making has prompted healthcare institutions and policymakers to explore digital health technologies as alternatives to traditional paper-based record systems. Although EHR implementation in Nigeria remains at varying stages of development across healthcare facilities, available evidence suggests that digital record systems are gradually transforming the management and delivery of healthcare services.

One of the most significant contributions of EHRs in Nigeria relates to improvements in health information management. Historically, healthcare institutions have relied heavily on paper-based records that are often vulnerable to loss, duplication, deterioration, and retrieval difficulties. Such challenges undermine continuity of care and limit the availability of accurate health information for clinical and administrative purposes. The introduction of EHR systems has improved the accessibility, completeness, and reliability of patient records in facilities where implementation has been successful. Olukorode et al. (2024) found that electronic medical record systems significantly enhanced data quality within Nigerian healthcare institutions, leading to better documentation practices and improved information management. These improvements are particularly important in a healthcare environment where reliable data are essential for disease surveillance, health planning, and resource allocation.

EHRs have also contributed to improved clinical decision-making and patient care. Access to comprehensive and up-to-date patient information enables healthcare professionals to make more informed treatment decisions, monitor patient progress more effectively, and reduce the likelihood of medical errors. Electronic records facilitate the integration of laboratory results, medication histories, diagnostic information, and treatment plans into a single platform, thereby improving continuity of care and coordination among healthcare providers. Aniekwe et al. (2023) observed that electronic health information exchange systems enhanced the completeness and validity of healthcare data used in monitoring treatment outcomes, particularly in HIV care programmes. Such findings suggest that EHRs can play an important role in supporting evidence-based clinical practice and improving healthcare outcomes.

Another important benefit of EHR adoption relates to healthcare administration and organizational efficiency. Digital record systems reduce the administrative burden associated with manual record keeping and facilitate faster retrieval of patient information. Healthcare institutions can also utilize EHR-generated data to monitor service delivery, evaluate performance indicators, and identify areas requiring improvement. In this regard, EHRs contribute not only to clinical care but also to organizational learning and healthcare governance. The increasing availability of health data generated through EHR systems has the potential to strengthen public health surveillance, healthcare planning, and policy formulation at both institutional and national levels.

Despite these benefits, the diffusion of EHRs across Nigeria remains uneven and faces numerous challenges. One of the most persistent barriers is inadequate technological infrastructure. Reliable electricity supply, internet connectivity, computer hardware, and technical maintenance services remain insufficient in many healthcare facilities, particularly in rural and underserved areas. These infrastructural limitations constrain the effective deployment and utilization of digital health technologies. Even where EHR systems have been introduced, recurring power outages and unstable internet access frequently disrupt routine operations and undermine system reliability.

Financial constraints constitute another significant obstacle to EHR implementation. The acquisition, installation, maintenance, and upgrading of EHR systems require substantial financial investment. Many healthcare institutions, especially public hospitals and primary healthcare facilities, operate under limited budgets and struggle to allocate sufficient resources for digital transformation initiatives. Consequently, implementation efforts are often dependent on donor funding, external partnerships, or short-term project support, raising concerns regarding sustainability and long-term system maintenance.

Workforce-related challenges also affect EHR adoption in Nigeria. Successful implementation requires healthcare professionals who possess the digital competencies necessary to utilize electronic systems effectively. However, studies indicate that varying levels of digital literacy, inadequate training opportunities, and resistance to technological change continue to impede adoption. Some healthcare workers perceive EHR systems as additional administrative burdens rather than tools that enhance clinical practice. Such perceptions may reduce user acceptance and limit the realization of anticipated benefits. The socio-technical perspective suggests that addressing these challenges requires not only technical training but also organizational strategies that foster user engagement and institutional support.

Interoperability remains another critical concern. Many healthcare institutions operate different digital platforms that lack the capacity to communicate effectively with one another. The absence of standardized data exchange mechanisms limits the ability of healthcare providers to access patient information across facilities and undermines the continuity of care that EHR systems are intended to promote. Furthermore, concerns relating to data security, privacy protection, and cybersecurity continue to generate apprehension among healthcare providers and patients alike. As healthcare information becomes increasingly digitized, the need for robust legal and regulatory frameworks governing data protection becomes more urgent.

Recent policy developments indicate growing recognition of the importance of digital health within Nigeria's healthcare system. National digital health initiatives and health sector reform programmes increasingly emphasize the need to strengthen health information systems, improve interoperability, and expand the use of digital technologies. However, achieving these objectives requires more than the acquisition of technological infrastructure. Effective implementation demands coordinated investments in workforce development, institutional capacity building, regulatory oversight, and sustainable financing mechanisms.

The Nigerian experience illustrates the central argument of the socio-technical approach: technological innovations achieve meaningful outcomes only when supported by appropriate

social, organizational, and institutional conditions. While EHRs possess considerable potential to improve healthcare quality through better information management, enhanced clinical decision-making, and strengthened healthcare coordination, their effectiveness ultimately depends on the broader contexts within which they are implemented. Consequently, efforts to expand EHR adoption in Nigeria must address both technological deficiencies and the socio-organizational challenges that continue to shape healthcare delivery.

Gap in the Literature and Contribution of the Study

The growing body of literature on Electronic Health Records (EHRs) demonstrates increasing scholarly interest in the role of digital technologies in healthcare delivery. Existing studies have examined various dimensions of EHR implementation, including technological infrastructure, user acceptance, interoperability, healthcare efficiency, patient safety, and health information management. Within the Nigerian context, recent scholarship has highlighted the potential of EHRs to improve healthcare data quality, strengthen clinical decision-making, and enhance service delivery. Similarly, studies conducted across other low- and middle-income countries have emphasized the importance of digital health technologies in promoting healthcare system modernization and supporting evidence-based healthcare planning.

Despite these contributions, several gaps remain evident in the literature. First, much of the existing research adopts a predominantly technological or administrative perspective, focusing on system functionality, implementation barriers, and adoption outcomes. While such studies provide valuable insights into the technical dimensions of EHR deployment, they often pay limited attention to the broader social and organizational contexts that shape technology use within healthcare institutions. Consequently, insufficient attention has been devoted to understanding how interactions between healthcare professionals, institutional structures, organizational cultures, and technological systems influence the effectiveness of EHRs in improving healthcare quality.

Second, the Nigerian literature on EHRs remains fragmented. Existing studies tend to examine specific aspects of implementation, such as data quality, infrastructure, user acceptance, or policy challenges, in isolation. As a result, there is limited integrative scholarship that synthesizes these diverse findings into a coherent understanding of how EHRs contribute to healthcare quality within the Nigerian healthcare system. This fragmentation makes it difficult to appreciate the complex relationship between digital technologies, healthcare institutions, and service delivery outcomes.

Third, relatively few studies have engaged EHR adoption from the perspective of medical sociology. The sociological dimensions of digital health transformation, including issues of professional practice, organizational change, institutional capacity, technological inequality, workplace adaptation, and healthcare governance, remain underexplored within the Nigerian context. Yet these factors are critical for understanding why similar technologies often produce different outcomes across healthcare settings.

This study addresses these gaps by providing a narrative review of the role of Electronic Health Records in improving healthcare quality in Nigeria through the analytical lens of the socio-technical approach. By synthesizing evidence from health informatics, public health, healthcare management,

and medical sociology, the study moves beyond narrowly technical explanations to examine the interplay between technological systems and social institutions. In doing so, it contributes to ongoing scholarly debates concerning digital transformation, healthcare quality, and health system development in developing countries. The study also provides a consolidated account of the benefits, challenges, and policy implications of EHR adoption in Nigeria, thereby offering a useful resource for researchers, healthcare practitioners, and policymakers seeking to strengthen digital health implementation and healthcare quality outcomes.

FINDINGS AND DISCUSSION

EHRs as Instruments for Improving Healthcare Quality

The reviewed literature consistently identifies Electronic Health Records (EHRs) as important tools for improving healthcare quality. Across both developed and developing healthcare systems, EHRs have contributed to enhanced access to patient information, improved clinical decision-making, reduced documentation errors, and better continuity of care. The transition from paper-based records to digital information systems has enabled healthcare providers to retrieve patient information more efficiently and coordinate treatment across multiple points of care. In the Nigerian context, studies indicate that EHR implementation has improved the completeness, accessibility, and reliability of health records, thereby strengthening patient management and healthcare delivery (Olukorode et al., 2024).

From a socio-technical perspective, these improvements cannot be attributed solely to technological advancement. Rather, they result from the interaction between digital systems and healthcare professionals who utilize them in clinical practice. The ability of EHRs to improve healthcare quality depends on how effectively healthcare institutions integrate technology into existing organizational processes and professional workflows. Consequently, EHRs function not merely as information storage systems but as organizational tools that support evidence-based healthcare delivery.

Health Information Management and Evidence-Based Decision-Making

A second major theme emerging from the literature concerns the contribution of EHRs to health information management and evidence-based decision-making. Reliable health information is essential for effective clinical practice, healthcare planning, disease surveillance, and policy formulation. Several studies reviewed indicate that EHR systems improve data accuracy, reduce information loss, and facilitate real-time access to patient records. These improvements strengthen both individual patient care and broader health system management.

Within Nigeria, weaknesses in health information systems have historically limited the availability of accurate healthcare data for planning and resource allocation. The adoption of EHRs has the potential to address these deficiencies by providing healthcare institutions with more reliable data for monitoring service delivery and evaluating healthcare outcomes. Furthermore, digital record systems facilitate the aggregation and analysis of health information, enabling policymakers to make more informed decisions regarding healthcare interventions and resource distribution.

The socio-technical framework helps explain why improvements in information management require more than technological infrastructure. Effective utilization of health information depends upon organizational commitment to data quality, professional competence in digital documentation, and institutional mechanisms that encourage the use of evidence in decision-making processes.

Socio-Organizational Barriers to Effective EHR Implementation

Despite the documented benefits of EHRs, the literature reveals numerous barriers that continue to constrain their effectiveness within the Nigerian healthcare system. Infrastructural deficiencies remain among the most frequently cited challenges. Unreliable electricity supply, poor internet connectivity, inadequate hardware, and limited technical support undermine the consistent operation of EHR systems in many healthcare facilities. These challenges are particularly pronounced in rural and underserved areas where healthcare institutions often operate with limited resources.

The literature also identifies workforce-related challenges as significant obstacles to successful implementation. Inadequate digital literacy, insufficient training opportunities, and resistance to organizational change frequently limit healthcare professionals' willingness and ability to utilize EHR systems effectively. Some healthcare workers perceive digital technologies as increasing administrative workloads rather than enhancing clinical practice. Such perceptions may reduce user acceptance and contribute to implementation failures.

These findings support the central argument of the socio-technical approach, which emphasizes that technological systems cannot function effectively in isolation from their social environments. The success of EHR implementation depends not only on software and hardware but also on organizational culture, leadership commitment, workforce competence, and institutional readiness for change.

Policy, Governance, and the Future of Digital Health in Nigeria

The reviewed literature further highlights the importance of policy and governance frameworks in shaping EHR adoption. Effective digital health systems require supportive regulatory environments, sustainable financing mechanisms, interoperability standards, and robust data protection measures. Although Nigeria has made important progress through various digital health initiatives, the implementation of EHR systems remains fragmented across healthcare institutions.

The absence of comprehensive interoperability standards limits information exchange between healthcare facilities and reduces the potential benefits of integrated digital health systems. Similarly, concerns regarding data privacy and cybersecurity continue to generate apprehension among healthcare providers and patients. As healthcare data become increasingly digitized, the need for stronger governance frameworks becomes more urgent.

From a medical sociological perspective, digital health transformation should be understood as a process of institutional change rather than simply technological adoption. Sustainable EHR implementation requires coordinated efforts involving healthcare professionals, policymakers,

healthcare administrators, technology providers, and regulatory agencies. Without such collaboration, technological investments may fail to produce meaningful improvements in healthcare quality.

DISCUSSION OF FINDINGS

The findings of this review demonstrate that Electronic Health Records possess significant potential to improve healthcare quality in Nigeria through enhanced information management, better clinical decision-making, improved patient safety, and stronger healthcare coordination. These findings are broadly consistent with international evidence indicating that digital health technologies can contribute positively to healthcare delivery when implemented under supportive organizational conditions.

However, the review also reveals that technological capability alone is insufficient to guarantee improved healthcare outcomes. The persistence of infrastructural limitations, workforce challenges, financial constraints, and governance deficiencies suggests that the effectiveness of EHRs is shaped by broader socio-organizational factors. This finding supports the socio-technical framework adopted in this study, which views healthcare technologies as products of interaction between technical systems and social institutions.

The Nigerian experience demonstrates that digital transformation in healthcare is fundamentally both a technological and sociological process. While investments in infrastructure and software remain necessary, equal attention must be devoted to organizational readiness, workforce development, leadership support, regulatory oversight, and institutional capacity building. Consequently, efforts to improve healthcare quality through EHR adoption must move beyond technological solutions toward comprehensive strategies that address the social and organizational realities of healthcare delivery.

Conclusion and Policy Implications

This narrative review examined the role of Electronic Health Records (EHRs) in improving healthcare quality in Nigeria through a socio-technical perspective. The review found that EHRs have significant potential to enhance healthcare quality by improving the accuracy and accessibility of patient records, supporting evidence-based clinical decision-making, strengthening continuity of care, and enhancing health information management. However, the findings also reveal that these benefits remain uneven because EHR implementation is constrained by inadequate digital infrastructure, limited interoperability, insufficient workforce capacity, financial constraints, and weak institutional support. The review therefore demonstrates that improvements in healthcare quality depend not only on the availability of digital technologies but also on the organizational and policy environments within which they operate.

These findings have important policy implications. Since infrastructural deficiencies emerged as the most frequently reported barrier, digital health investments should prioritize reliable technological infrastructure alongside system deployment. Similarly, the consistent evidence on workforce limitations indicates that EHR implementation strategies must integrate continuous

professional training and organizational change management. Furthermore, the recurring concerns regarding fragmented information systems and data governance highlight the need for national interoperability standards and stronger regulatory frameworks to support secure and coordinated healthcare delivery.

Based on the evidence synthesized in this review, the following recommendations are proposed:

1. Health care facilities management should invest in reliable electricity, internet connectivity, and technical support systems to ensure the sustainable operation of EHR platforms across healthcare facilities.
2. Health care facilities management should establish continuous training and institutional support programmes to improve digital literacy, promote user acceptance, and enhance the effective utilization of EHR systems.
3. The Federal Ministry of Health should develop and enforce national standards for health information exchange, data protection, and cybersecurity to facilitate integrated, secure, and patient-centred healthcare delivery.

In conclusion, Electronic Health Records possess significant potential to improve healthcare quality in Nigeria. However, technological adoption alone cannot transform healthcare delivery. Sustainable improvements in healthcare quality require integrated approaches that address both technological and socio-organizational dimensions of digital health implementation. By aligning technological innovation with institutional capacity, workforce development, and effective governance, Nigeria can more fully harness the transformative potential of EHRs to strengthen healthcare delivery and improve population health outcomes.

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