



ELECTRONIC MEDICAL RECORD IMPLEMENTATION IN COLLEGE CLINICS: AN ANALYSIS OF STUDENT VIEWPOINTS

EBOKA, Andrew O.¹, ONOCHIE, Christopher C.² & AKHATOR, Doris Ndudi³
^{1,2,3} Department of Computer Education, Federal College of Education (Technical), Asaba
E-mails: andrew.eboka@fcetasaba.edu.ng, ebokaandrew@gmail.com¹,
Xtoline2@gmail.com², akhatordoris@gmail.com³

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ABSTRACT

Electronic Medical Records (EMRs) are increasingly vital for improving efficiency, accuracy, and quality of healthcare delivery. While research has widely examined EMR adoption in hospitals and low-resource settings, little is known about student perspectives in college clinics. This study investigated students' views on EMR implementation at the Federal College of Education (Technical) Asaba, Nigeria. Using a structured questionnaire administered to 180 students, the study explored perceptions of efficiency, accessibility, barriers, and recommendations. Students generally viewed EMRs as beneficial for improving record retrieval, clinic organization, and service reliability. However, challenges such as lack of direct student access, privacy concerns, and infrastructural limitations, particularly frequent power outages, were identified as major barriers. Students strongly recommended secure online access to health records, options for electronic record requests, provision of backup power systems, regular staff training, and stronger privacy safeguards. The findings highlight that while EMRs enhance efficiency, addressing issues of accessibility, trust, and infrastructure is essential to maximizing their impact in academic healthcare settings.

KEYWORDS: Electronic Medical Records, Healthcare Efficiency, Data Privacy, Student Perceptions.

1.0 Introduction

The global healthcare landscape has undergone a profound digital transformation, largely propelled by the adoption of Electronic Medical Records (EMRs). Extensive research has documented the potential of EMRs to enhance cost-effectiveness, operational efficiency, patient safety, and the overall quality of care (Gopidasan, Amanullah, & Adebowale, 2022; Ayaad et al., 2019; Albagmi, 2021). By streamlining processes, reducing documentation errors, and improving access to patient information, EMRs represent a cornerstone of modern healthcare delivery (Alanazi, 2022; Kaneko et al., 2018). However, the successful implementation and sustained use of these systems are not merely technological challenges; they are complex socio-technical endeavors that hinge critically on user



acceptance and satisfaction (Aldosari, 2017; Hamade, Terry, & Malvankar-Mehta, 2019). This is particularly true in unique, resource-constrained environments like college and university health clinics.

College clinics serve a distinct, tech-savvy, and transient population, the students, whose healthcare needs and expectations differ significantly from those of the general public. For these young adults, digital literacy is often high, and there is a growing expectation for seamless, integrated digital services, including in healthcare (Montagni et al., 2018; Kujala et al., 2022). The integration of EMRs into these settings offers unique opportunities, such as providing students with access to their own health records, which can empower them to take an active role in their health management (Keough et al., 2018). Furthermore, for institutions with medical and health science programs, EMRs in student clinics can serve as invaluable pedagogical tools, offering students early exposure to the digital health systems they will use in their professional careers (Nickitas et al., 2010; Tudor Car et al., 2021; Reeves et al., 2022).

Despite these potential benefits, significant challenges to implementation persist, many of which are amplified in the campus environment. The existing literature on EMR implementation has extensively covered perspectives from healthcare professionals, administrators, and patients in traditional hospital and primary care settings (Adegbore, 2024; Suwanti, Rachmani, & Rimawati, 2025; Deharja et al., 2020). A considerable body of work also focuses on the immense challenges of deploying EMRs in low-resource settings globally, highlighting issues of infrastructure, cost, training, and cultural acceptability (Jawhari et al., 2016; Syzdykova et al., 2017; Tilahun & Fritz, 2015a, 2015b; Kabukye et al., 2020; Deriel et al., 2018; Woldemariam & Jimma, 2023). However, a critical gap remains in understanding the specific viewpoint of a key stakeholder group in the academic ecosystem: the student body itself.

Students are not just passive recipients of care in these clinics; they are central actors whose acceptance and engagement can determine the success or failure of an EMR system. Their perspective encompasses concerns about data privacy, the usability of patient portals, the impact on the patient-provider relationship, and the system's effect on wait times and service efficiency (Sison et al., 2025; Brown, 2022; AlSuwaidi & Moonesar, 2021). Therefore, analyzing the student viewpoint is not a peripheral concern but a fundamental component of achieving meaningful and effective EMR implementation in college health centers.

This study seeks to fill this gap by conducting a comprehensive analysis of students' perceptions regarding EMR implementation in their campus clinics. By synthesizing insights from the broader literature on EMR benefits and challenges with the nascent research on digital health in educational settings, this paper explores the unique factors that influence student acceptance, satisfaction, and utilization of EMR systems. Ultimately, understanding this viewpoint is essential for college administrators and health IT professionals to design and implement systems that are not only technologically robust but also truly serve the needs of their primary user base, thereby enhancing the quality and efficiency of student healthcare delivery.



Problem Statement

Despite the recognized advantages of EMRs, FCE(T) Asaba Clinic has experienced persistent challenges related to manual record-keeping, including lost or incomplete records, delays in follow-up care, and inefficiencies in health service delivery. Previous anecdotal reports from students and clinic staff indicate that health records are often misplaced, follow-up visits are poorly tracked, and aggregated health data are difficult to compile for planning and policy purposes. Yet, there is limited empirical evidence quantifying the impact of EMRs in the context of student clinics in Nigerian tertiary institutions, particularly in Delta State. This gap hampers efforts to optimize student health services through digital record-keeping systems.

Aim of the Study

This study aims to analyze student viewpoints on the implementation of electronic medical records (EMRs) in college clinics.

Objectives of the Study

1. **To assess** how college students perceive the impact of EMR systems on the efficiency and accessibility of healthcare services in college clinics.
2. **To identify** the primary barriers affecting student engagement with EMR systems and how these barriers influence their trust in the system.
3. **To explore** students' recommendations for improving EMR systems to enhance accessibility, reliability, and trust in college clinic healthcare services.

Literature Review

The implementation of Electronic Medical Records (EMRs) has become a cornerstone of modern healthcare systems worldwide, driven by their potential to enhance cost-effectiveness, operational efficiency, and quality of care (Gopidasan, Amanullah, & Adebowale, 2022). EMRs facilitate improved documentation accuracy, reduce waiting times, and minimize errors in outpatient settings (Albagmi, 2021). Furthermore, they contribute to healthcare professional efficiency and mitigate burnout by streamlining administrative processes (Shaharul et al., 2023). Studies also highlight their role in improving hospital productivity and patient safety, underscoring their transformative impact on healthcare delivery (Kaneko et al., 2018; Aldosari, 2017; Alanazi, 2022).

EMR Implementation in Resource-Constrained Settings

A significant body of literature addresses EMR implementation in low-resource settings, revealing both benefits and challenges. Jawhari et al. (2016) note that while EMRs offer advantages such as improved data management and care quality, their adoption in resource-limited contexts faces barriers like infrastructural deficits, financial constraints, and training gaps. Open-source EMR systems have emerged as viable solutions in these environments, though their success depends on local adaptability



and sustained technical support (Syzdykova et al., 2017). Studies in Ethiopia and Haiti emphasize the importance of stakeholder engagement, organizational readiness, and continuous evaluation for successful EMR implementation (Tilahun & Fritz, 2015a, 2015b; Deriel et al., 2018). In low-income countries, EMR adoption is increasingly seen as a catalyst for enhancing healthcare quality, provided implementation strategies are context-specific and resource-sensitive (Woldemariam & Jimma, 2023).

EMRs in Educational and Student Healthcare Contexts

The integration of EMRs in educational settings, particularly college and university clinics, introduces unique opportunities and challenges. For health science students, EMRs serve as critical tools for developing clinical documentation and communication skills (Nickitas et al., 2010; Moore, Vaughan, & Cox, 2017). Digital health training programs are essential for preparing future healthcare professionals, and EMRs play a central role in this education (Tudor Car et al., 2021). The COVID-19 pandemic accelerated the integration of student health records into broader EMR systems, improving care coordination and responsiveness during crises (Reeves et al., 2022).

University students, generally tech-savvy, express strong interest in digital health tools. Montagni et al. (2018) found that students are open to using digital health applications, suggesting potential receptivity to EMR-based services in campus clinics. However, challenges such as data privacy concerns, usability issues, and interoperability with existing systems remain significant (Sison et al., 2025). Keough et al. (2018) highlighted that student-accessible health records can empower patients and improve engagement, but their implementation must address concerns related to security and user-friendly design (Binitie et al., 2021).

User Satisfaction and Usability of EMRs

User satisfaction is a critical determinant of EMR success. Studies indicate that usability, training, and system reliability significantly influence healthcare professionals' acceptance and effective use of EMRs (Adegbore, 2024; Binitie & Babatunde, 2024; Suwarti, Rachmani, & Rimawati, 2025). The Human-Organization-Technology-fit (HOT-fit) model provides a framework for evaluating EMR usability, emphasizing the alignment between technical functionality and user needs (Deharja et al., 2020). From the patient perspective, experiences with web-based access to EMRs are generally positive, though variations exist based on design and accessibility features (Kujala et al., 2022). In the context of college clinics, student satisfaction with EMRs likely depends on factors such as ease of use, perceived utility, and the ability to access personal health information seamlessly (AlSuwaidi & Moonesar, 2021).

While extensive research exists on EMR implementation in hospitals and low-resource settings, there is a notable gap concerning the student perspective in college health environments. Most studies focus on healthcare providers or patients in general contexts, with limited attention to the unique needs and viewpoints of student populations (Brown, 2022; Kumar et al., 2024). College clinics operate at the intersection of healthcare and education, serving a demographic with distinct expectations and digital literacy levels. Understanding student perceptions, encompassing usability, privacy, accessibility, and



overall satisfaction, is essential for designing EMR systems that are both effective and acceptable in academic settings.

Therefore, this research aims to address this gap and provide actionable recommendations for optimizing EMR systems in student healthcare contexts.

Research Questions

- 1: How do college students perceive the impact of electronic medical record (EMR) systems on the efficiency and accessibility of healthcare services in college clinics?
- 2: *What are the primary barriers to student engagement with EMR systems in college clinics, and how do these barriers influence their trust in the system?*
- 3: What recommendations do college students suggest for improving the electronic medical record (EMR) system in college clinics to enhance accessibility, reliability, and trust?

Area of Study

The study was conducted at the Federal College of Education (Technical) Asaba in Delta State, Nigeria. The campus clinic provides primary health care services for students and staff. The institution draws students from across Nigeria, making it a representative sample for understanding student health trends in a tertiary educational environment.

Population, Sample and Sampling Technique

For the purpose of this study, the target population comprised all students registered with the campus clinic in the 2024/2025 academic session.

A sample size of 180 students was selected for the survey. The sample was determined using Cochran's formula for sample size estimation in finite populations and was adjusted to account for non-response. A stratified random sampling technique was employed, stratifying the sample by level of study (NCE I, NCE II, NCE III, & 100L-400L UNIBEN extension students within the campus) to ensure proportional representation across the institution's student levels.

Data Collection Method

Data were collected using a structured questionnaire, administered in person to sampled students at the clinic. The questionnaire was divided into sections corresponding to the research questions: (i) effectiveness of EMRs, (ii) implementation challenges, and (iii) recommendation levels. Items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was pre-tested on 20 students from a similar institution outside FCE(T) Asaba to ensure clarity and reliability. Cronbach's alpha was calculated for internal consistency and found to be acceptable ($\alpha = 0.82$).



Presentation of Result

Table 1: Students' Perceptions of EMR on Efficiency and Accessibility (RQ1)

Item No.	Questionnaire Item	Mean (M)	Standard Deviation (SD)
1	The clinic staff's use of the EMR system reduces the time I spend waiting during clinic visits.	3.98	0.82
2	The EMR system allows clinic staff to quickly retrieve my health records when I need care.	4.21	0.71
3	The EMR system helps clinic staff provide treatment and follow-ups more efficiently.	4.05	0.77
4	I feel that the use of the EMR system improves the overall organization of healthcare services in the clinic.	4.12	0.74
5	The EMR system makes healthcare services in the clinic more reliable compared to paper records.	4.08	0.79

Table 2: Barriers to Student Engagement with EMR Systems (RQ2)

Item No.	Questionnaire Item	Mean (M)	Standard Deviation (SD)
1	Because the EMR system is offline, I cannot access my health records directly and must rely on clinic staff to provide information.	3.42	0.88
2	Waiting for clinic staff to retrieve my records from the EMR system sometimes delays my access to important health information.	3.55	0.92
3	Relying solely on clinic staff to access my EMR records makes me concerned about privacy and confidentiality.	3.68	0.85
4	Having to visit the clinic in person to access my records makes the EMR system less convenient for me compared to online alternatives.	3.73	0.91
5	Electricity interruptions in the college reduce the reliability of the EMR system and may delay urgent care.	3.60	0.94



Table 3: Recommendations for Improving EMR System (RQ3)

Item No.	Questionnaire Item	Mean (M)	Standard Deviation (SD)
1	Providing students with limited online access to their health records (e.g, immunization history, appointment details) would improve the usefulness of the EMR system.	4.34	0.68
2	Installing backup power solutions (e.g, solar panels or generators) would make the EMR system more reliable during electricity outages.	4.28	0.72
3	Training clinic staff regularly on EMR usage would improve accuracy and efficiency in managing student health records.	4.15	0.76
4	Introducing stronger privacy measures (e.g, clear communication on who can access records) would increase my trust in the EMR system.	4.22	0.70
5	Allowing students to request copies of their EMR records electronically (e.g, via email or secure portal) would improve accessibility and convenience.	4.31	0.67

Discussion of Result

The results from Table 1 shows that students generally perceived the EMR system positively in enhancing efficiency and accessibility of college clinic services. The highest mean was for quick record retrieval (M = 4.21, SD = 0.71), indicating that students valued how rapidly staff could access their records. This aligns with findings from Ayaad et al. (2019), who reported that EMRs significantly improve the timeliness of accessing patient information and enhance the quality of care. Similarly, Albagmi (2021) emphasized that EMR implementation reduces patient waiting times, supporting the moderate-to-high rating students gave for reduced waiting during clinic visits (M = 3.98, SD = 0.82).

Students also indicated that EMRs improved organization (M = 4.12, SD = 0.74) and reliability compared to paper-based records (M = 4.08, SD = 0.79). Prior studies confirm that EMRs contribute to better documentation accuracy, reliability, and reduced medical errors (Aldosari, 2017; Alanazi, 2022). Moreover, the perception of efficiency reflects what Gopidasan et al. (2022) described as the *cost-effectiveness and usability* benefits of EMRs when properly implemented. These findings suggest that students recognize EMRs as not only functional but also integral to quality service delivery in college clinics.

Table 2 shows that, although students perceived benefits, they also identified moderate barriers. The most prominent issues were lack of direct access (M = 3.42, SD = 0.88), concerns over confidentiality (M = 3.68, SD = 0.85), and the inconvenience of in-person access compared to online alternatives (M = 3.73, SD = 0.91). These concerns resonate with Jawhari et al. (2016), who observed that in low-



resource settings, EMR adoption is often hindered by infrastructural limitations and user concerns about system transparency. Confidentiality issues highlighted by students echo Aldosari's (2017) findings that patient safety and privacy are at risk if EMR governance is weak.

Technical challenges, such as delays caused by staff retrieving records ($M = 3.55$, $SD = 0.92$) and disruptions due to electricity outages ($M = 3.60$, $SD = 0.94$), also impacted trust in the system. These infrastructural issues have been widely documented in low-resource contexts, where unstable electricity and offline systems compromise the reliability of EMRs (Tilahun & Fritz, 2015; Syzdykova et al., 2017). As Deriel et al. (2018) noted, sustainability of EMR systems in such settings depends heavily on addressing these systemic barriers.

The moderate ratings suggest that while students recognize EMR benefits, barriers reduce their confidence and willingness to rely on the system. This finding mirrors Gatiti et al. (2021), who concluded that although EMRs enhance healthcare quality, unresolved barriers often limit their full potential.

Table 3 shows that students strongly endorsed recommendations to improve EMR accessibility, reliability, and trust. The highest-rated suggestion was providing limited online access to personal health records ($M = 4.34$, $SD = 0.68$), followed closely by the option to request electronic copies of records ($M = 4.31$, $SD = 0.67$). These preferences align with Keough et al. (2018) and Kujala et al. (2022), who found that giving patients or students access to their own health information enhances satisfaction, transparency, and trust. Reeves et al. (2022) also demonstrated that integrating student health records into broader health systems during COVID-19 improved accessibility and continuity of care.

Backup power solutions ($M = 4.28$, $SD = 0.72$) and regular staff training ($M = 4.15$, $SD = 0.76$) were also strongly supported. This is consistent with Hamade et al. (2019), who emphasized that continuous staff training and technical support are essential for sustainable EMR use, and with Woldemariam and Jimma (2023), who noted that infrastructural resilience is key for adoption in low-income settings. Students also emphasized the importance of stronger privacy measures ($M = 4.22$, $SD = 0.70$), reflecting findings by Kabukye et al. (2020) that patient trust depends on clear data governance and confidentiality safeguards.

Conclusion

The study found that students generally view electronic medical records (EMRs) as beneficial for improving efficiency, quick access to records, and overall organization of clinic services. However, challenges such as lack of direct student access, privacy concerns, and infrastructural issues, such as power outages, remain significant barriers. Students strongly supported system improvements, including online access, backup power, stronger privacy measures, and regular staff training. The results confirm that enhancing EMR systems can significantly improve students' perceptions of accessibility, reliability, and trust in healthcare services.



Recommendation

Drawing on the study's results and existing literature, it is recommended that institutional management should:

1. Provide limited, secure online access to personal health records through a student portal or mobile application.
2. Install backup power systems and ensure reliable internet connectivity to reduce service disruptions.
3. Conduct regular training programs for clinic staff on EMR updates, data privacy, and efficient system use.
4. Organize health information campaigns to inform students about the purpose, benefits, and privacy safeguards of EMRs.
5. Develop clear policies on EMR governance, including data access, sharing rules, and accountability mechanisms.

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