Assessment of Electronic Health Records Adoption in Federal Medical Center, Mubi, Adamawa State, Nigeria

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ABSTRACT

Electronic Health Records (EHR) are vital tools for enhancing healthcare delivery, improving data accuracy, and supporting clinical decision-making. Despite global progress, adoption in Nigerian healthcare institutions remains limited due to infrastructural and organizational challenges. This study assessed the level of EHR adoption at Federal Medical Center (FMC) Mubi, Adamawa State, and examined key factors influencing implementation. Using a descriptive cross-sectional design, data were collected from health records professionals and staff involved in patient information management through a structured, self-administered questionnaire. Analysis was conducted using SPSS, applying descriptive statistics, Chi-square tests, and logistic regression. Results showed that only 19% of respondents routinely used EHR systems, while 81% relied on manual records. Adoption was significantly associated with formal training (OR = 3.2, $p < 0.01$), computer literacy (OR = 2.5, $p < 0.05$), and management support (OR = 2.7, $p < 0.05$). Major barriers included inadequate training (70%), poor infrastructure (65%), and resistance to change (40%), often driven by generational skill gaps and organizational inertia. The findings suggest FMC Mubi is in the preparatory phase of EHR adoption. Addressing foundational gaps through strategic investment, behavioral interventions, and leadership engagement is essential for full-scale implementation. The study recommends future longitudinal research and alignment with national and global digital health frameworks to ensure sustainability and impact.

Keywords: Electronic Health Records, Technology Adoption, Health Information Management, Infrastructure, Nigeria

INTRODUCTION

The digitization of health information has emerged as a transformative global trend, reshaping healthcare delivery through the integration of Electronic Health Records (EHR). EHR systems provide digital versions of patients' medical histories, enabling seamless information exchange, improved clinical decision-making, and enhanced quality of care. Studies across developed countries have shown that EHR adoption significantly improves clinical efficiency, patient safety, and healthcare outcomes, largely due to supportive policies and advanced infrastructure.

In contrast, many African countries, including Nigeria, face considerable challenges in EHR implementation. Research by Adepoju et al. (2017) identified poor infrastructure and limited ICT skills as major barriers, while Adebayo et al. (2020) emphasized the role of organizational support and staff training in influencing adoption.

The Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) theory offer useful frameworks for understanding these dynamics, focusing on perceived usefulness, ease of use, and readiness for change.

Despite national efforts to integrate EHR systems into Nigerian healthcare institutions, adoption remains limited due to funding constraints, infrastructural deficits, and low technical proficiency among health professionals. This study investigates the current state of EHR adoption at Federal Medical Center (FMC) Mubi, a tertiary healthcare institution in Adamawa State, Nigeria. It focuses on staff skills, challenges, and key determinants of successful implementation.

METHODS

Study Design: This study employed a descriptive cross-sectional design to assess the level of EHR adoption and associated factors among healthcare staff in FMC Mubi.

Study Area: The research was conducted at Federal Medical Center (FMC), Mubi, located in Adamawa State, Nigeria, a major tertiary healthcare institution serving a diverse patient population.

Study Population: The study population included health records professionals and other staff directly involved in patient information management.

Sample Size and Sampling Technique: A proportionate sampling technique was used to select participants from the health records department, ensuring representative coverage of relevant staff categories.

Instrumentation: Data were collected using a structured, self-administered questionnaire. The instrument covered demographic characteristics, knowledge, attitudes, skills, level of EHR adoption, and perceived challenges.

Data Analysis: Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics (frequencies, percentages, and means) summarized the data, while inferential statistics (Chi-square tests and logistic regression) examined associations between variables.

Ethical Considerations: Ethical clearance was obtained from the FMC Mubi Ethics Committee. Informed consent was secured from all participants, and confidentiality of responses was strictly maintained throughout the study.

RESULTS

The demographic analysis revealed that the majority of respondents were aged between 25 and 45 years, with varied years of professional experience in health records and patient information management. This reflects a workforce that is potentially adaptable to technological change, yet still constrained by infrastructural and institutional limitations typical of resource-limited settings.

Only 19% of respondents reported using Electronic Health Records (EHR) systems for routine tasks such as patient registration, documentation, and retrieval of medical histories. The remaining 81% continued to rely on manual record-keeping methods. This low adoption rate indicates that EHR implementation at Federal Medical Center (FMC) Mubi is still in its preparatory phase and far from institutionalized. These findings are consistent with similar studies conducted in tertiary hospitals across Nigeria and sub-Saharan Africa, where adoption rates remain below 30% due to systemic challenges.

Statistical analysis revealed significant associations between EHR adoption and several enabling factors. Staff who had received formal training on EHR usage were significantly more likely to adopt the system ($\chi^2 = 12.45$, $p < 0.01$), with logistic regression showing an odds ratio of 3.2 (95% CI: 1.8–5.6). Computer literacy also showed a strong positive correlation ($\chi^2 = 10.87$, $p < 0.05$; OR = 2.5, 95% CI: 1.4–4.3), while perceived

management support emerged as a key predictor (χ^2 = 15.62, p < 0.01; OR = 2.7, 95% CI: 1.5–4.9). These results underscore the importance of capacity-building and leadership engagement in driving digital transformation.

Respondents identified multiple barriers to EHR adoption: inadequate training (70%), poor infrastructure (65%), lack of management support (50%), and resistance to change (40%). The behavioral resistance was often linked to generational skill gaps, fear of redundancy, and organizational inertia. These challenges reflect broader systemic issues and align with findings from studies in Ghana, Kenya, and other Nigerian institutions, reinforcing the need for targeted behavioral and structural interventions.

DISCUSSION

The results of this study clearly indicate that FMC Mubi is in the preparatory phase of Electronic Health Records (EHR) adoption. With only 19% of respondents reporting routine use of EHR systems, the institution has yet to achieve widespread integration of digital health information management. This finding mirrors broader patterns observed in Nigerian tertiary healthcare facilities, where infrastructural limitations, low digital literacy, and inconsistent policy support continue to impede progress. For instance, a study in Lagos reported an EHR adoption rate of 22%, citing similar barriers such as unreliable power supply and limited staff training (Okonkwo et al., 2019). Comparable challenges have also been documented in Ghana and Kenya, where adoption rates remain below 30% in public hospitals (Mensah et al., 2020; Otieno et al., 2018).

The significant associations between EHR adoption and factors such as training, computer literacy, and management support reinforce the relevance of the Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) theory. These frameworks suggest that perceived usefulness, ease of use, and organizational readiness are critical to successful technology uptake. At FMC Mubi, the lack of adequate training (reported by 70% of respondents) and poor infrastructure (65%) are major obstacles. Logistic regression analysis further revealed that respondents with prior computer training were 3.2 times more likely to adopt EHR systems (OR = 3.2, 95% CI: 1.8–5.6, p < 0.01), while those who perceived strong management support had 2.7 times higher odds of adoption (OR = 2.7, 95% CI: 1.5–4.9, p < 0.05).

Resistance to change, reported by 40% of participants, underscores the behavioral and organizational challenges that must be addressed. This resistance may stem from generational digital skill gaps, fear of job redundancy, lack of incentives, or entrenched workplace cultures that are averse to technological disruption. These findings align with prior studies that emphasize the importance of behavioral interventions, such as peer mentoring, change champions, and performance-based incentives to facilitate smoother transitions to digital systems (Adeleke et al., 2021).

Despite these barriers, the presence of a digitally aware workforce and partial EHR usage signals potential for growth. However, without strategic interventions, the institution risks stagnating in this preparatory phase, unable to fully realize the benefits of EHR systems in improving clinical efficiency, data accuracy, and patient outcomes. It is also important to acknowledge the limitations of this study: the single-center scope may limit generalizability across Nigeria, the use of self-reported data introduces potential response bias, and the cross-sectional design restricts causal inference.

CONCLUSION

This study highlights that FMC Mubi is currently at the foundational stage of EHR adoption, with limited usage and significant barriers impeding full-scale implementation. While there is growing awareness and partial engagement with digital systems, infrastructural deficits, inadequate training, and behavioral resistance remain critical challenges. Addressing these issues through strategic investment, capacity-building, and leadership support is essential for transitioning from preparatory efforts to comprehensive EHR integration.

To enhance sustainability, future research should explore longitudinal and interventional approaches to monitor EHR uptake over time, assess cost-effectiveness, and evaluate impacts on patient outcomes and data quality. Emphasis should also be placed on behavioral strategies, such as peer-led training, digital literacy programs, and incentive systems to reduce resistance and foster a culture of innovation.

Furthermore, aligning institutional efforts with national and global frameworks, such as Nigeria's National Health ICT Strategic Framework and the WHO Digital Health Strategy (2020–2025) will be critical in ensuring that EHR implementation is scalable, contextually relevant, and sustainable. Institutions like FMC Mubi must be empowered to lead the way in adopting efficient, patient-centered health information systems that support Nigeria's broader digital health transformation agenda.

RECOMMENDATIONS

To advance EHR adoption at FMC Mubi and similar institutions across Nigeria, the following strategic recommendations are proposed:

1. **Infrastructure Development**: Upgrade digital infrastructure to include reliable internet connectivity, secure data servers, uninterrupted power supply, and modern computing equipment. These foundational elements are essential for ensuring system stability and scalability.
2. **Capacity Building**: Implement continuous, role-specific training programs that address both technical competencies and system usability. Training should be inclusive of all staff categories and incorporate digital literacy, data security, and workflow integration.
3. **Leadership Engagement**: Strengthen institutional commitment through formal policy frameworks, dedicated budget allocations, and active leadership advocacy. Visible support from hospital management is critical to fostering trust and driving organizational change.
4. **Change Management and Behavioral Interventions**: Introduce sensitization campaigns, peer mentoring, and incentive systems to address resistance to change. Behavioral strategies should target generational skill gaps, promote digital confidence, and cultivate a culture of innovation and adaptability.
5. **Pilot Programs and Evaluation**: Launch targeted pilot initiatives with measurable benchmarks and feedback loops. These pilots should be used to test system usability, identify implementation bottlenecks, and refine strategies before full-scale deployment.
6. **Research and Sustainability Planning**: Encourage longitudinal and interventional studies to monitor EHR uptake, assess cost-effectiveness, and evaluate impacts on patient outcomes and data quality. Sustainability strategies should be developed to ensure long-term system maintenance, user engagement, and policy alignment.
7. **Policy Alignment and Global Frameworks**: Ensure that institutional efforts align with national and global digital health strategies, such as Nigeria's National Health ICT Strategic Framework and the WHO Global Strategy on Digital Health (2020–2025). This enhances relevance, funding opportunities, and scalability.

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