Healthcare Record Systems and Operational Difficulties in Selected Hospitals in Bayelsa State, Nigeria

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DOI: https://doi.org/10.51244/IJRSI.2026.1315PH00144

Received: 13 July 2026; Accepted: 18 July 2026; Published: 30 July 2026

ABSTRACT

Healthcare record systems form the backbone of patient information management in clinical settings. Even though digital health technology has advanced a great deal around the world, hospitals in developing countries still struggle to adopt and maintain record systems that work well. This study looked at the types of healthcare record systems currently used in three selected hospitals in Bayelsa State, Nigeria, and at the operational problems tied to managing them. A descriptive cross sectional survey was carried out among 94 Health Information Management professionals at Federal Medical Centre Yenagoa, Yenagoa Hospital and Maternity, and Kolo General Hospital. Data were gathered with a structured questionnaire and analysed using descriptive statistics and chi square tests.The results showed three distinct patterns of adoption. Paper based systems dominated at Federal Medical Centre Yenagoa, at 86.2 percent, fully electronic systems were used at Yenagoa Hospital and Maternity, at 8.5 percent, and a hybrid system was in place at Kolo General Hospital, at 5.3 percent. Operational difficulties were common across all three facilities. The most severe were unstable electricity supply (mean 4.62), insufficient maintenance funding (mean 4.55), inadequate training (mean 4.50), duplication of data entry (mean 4.48), and a shortage of computers (mean 4.41). A statistically significant association was found between facility type and system type (p less than 0.001).These findings show that healthcare digitalisation in Bayelsa State is moving at different speeds depending on each institution's infrastructure and capacity. Because the study covered only three hospitals out of the 97 in Bayelsa State, about 3.1 percent, the results cannot be generalised across Nigeria as a whole. Closing the gaps identified will require investment in power infrastructure, ongoing training built around real competency, and a phased, policy driven move toward fully electronic systems. Future studies should include the views of clinicians, administrators, technical staff, and patients, to build a fuller picture of how well these record systems actually work.

Keywords: Healthcare Record Systems, Electronic Health Records, Hybrid Systems, Operational Difficulties, Health Information Management, Bayelsa State, Digital Health Transformation

INTRODUCTION

Healthcare record systems sit at the centre of how patient information is managed and how care is delivered. They give hospitals an organised way to collect, store, retrieve, and manage a patient's medical information across the whole span of care. When these systems work well, doctors and nurses can find accurate, complete information quickly, and that supports sound clinical decisions. Good record systems also support continuity of care, improve communication between providers, cut down on medical errors, and make it easier to practise medicine based on evidence. Beyond the clinic, these systems support hospital administration too, feeding into planning, monitoring, evaluation, research, policy, and the management of resources (World Health Organization, 2021; World Bank, 2020).

As information and communication technology has advanced, healthcare record keeping has shifted from paper documentation toward Electronic Health Record systems. Unlike paper files, EHRs allow patient

information to be stored, retrieved, shared, and analysed electronically, which improves how accessible, accurate, secure, and efficient that information is. Electronic systems also speed up communication among providers, cut the duplication of records, improve how patient care is coordinated, and support better decisions on both the clinical and administrative sides (McBride & Tietze, 2018; Atasoy, Greenwood, & McCullough, 2019). Because of these benefits, many countries have made EHR adoption part of wider digital health strategies aimed at improving quality, patient safety, and how well institutions function.

Even with these advantages recognised, adoption of healthcare record systems remains uneven, especially in low and middle income countries. Some hospitals have moved fully to electronic records, but many still depend on paper, or run hybrid systems that mix paper and electronic records. In Nigeria, the shift to fully digital records has been slow, held back by weak infrastructure, unreliable electricity, poor internet access, limited funding, a shortage of skilled IT staff, and few chances for staff to receive proper training (Adeleke, Lawal, Adio, & Adebisi, 2019; Wager, Lee, & Glaser, 2021). These problems affect how efficient, reliable, and sustainable healthcare record systems can be.

Bayelsa State reflects this national picture closely. Its healthcare landscape includes a mix of public and private facilities at primary, secondary, and tertiary levels, each with a different level of technological readiness and institutional capacity. Some hospitals have adopted Electronic Health Records, while others still rely mostly on manual documentation or hybrid systems. These differences show up in how care is delivered, how information is managed, and how efficiently each facility runs. Continued reliance on paper and hybrid systems tends to slow down retrieval of patient information, duplicate documentation, add to healthcare workers' workload, weaken coordination of care, and raise the risk of records that are incomplete or wrong (Kruse, Stein, Thomas, & Kaur, 2017; Menachemi& Collum, 2020). These weaknesses reduce how effective healthcare services can be and make it harder to reach national digital health goals.

Knowing what types of record systems are currently used in health facilities, and what challenges come with using them, matters for improving health information management overall. This knowledge gives policymakers evidence to design better policy, strengthen institutions, upgrade ICT infrastructure, and build interventions that help Electronic Health Record systems succeed and last. It also helps policymakers, hospital administrators, and development partners see where investment and technical support are needed most.

With this background in mind, this study assessed the types of healthcare record systems operating in selected hospitals in Bayelsa State and examined the operational problems affecting how well these systems are used. The findings offer evidence that can support policy decisions, guide investment in digital health infrastructure, strengthen capacity building, and support better management of healthcare information across Bayelsa State and Nigeria more broadly.

LITERATURE REVIEW

Concept of Healthcare Record Systems

Healthcare record systems cover the methods, processes, and technologies used to collect, store, retrieve, and manage patient health information. They serve both clinical and legal purposes, documenting each stage of a patient's contact with health services and giving a basis for accountability and quality control (Ozair, Jamshed, Sharma, & Aggarwal, 2015). How well these systems work depends on several things, including how the system is designed, how skilled the users are, what infrastructure is available, and how much support the organisation gives it.

Types of Healthcare Record Systems

Paper Based Health Record Systems

Paper based systems are the traditional way of managing health information, built around physical documents such as case notes, registers, folders, and filing cabinets. Staff record patient information by hand, covering

demographic details, medical history, diagnoses, treatment plans, and clinical outcomes. These systems are still common in settings with limited resources because they are simple and need little technical support (Menachemi& Collum, 2020).

Still, paper based systems carry real limitations. Records can be lost, damaged, or misplaced, especially in busy clinical settings. Physical storage struggles to keep up as patient numbers grow, which adds administrative strain and inefficiency (Nguyen, Bellucci, & Nguyen, 2021). Finding a record means searching through filing archives by hand, which slows clinical work and makes emergency response slower. Because there is no automation, records get duplicated and documentation becomes inconsistent, which weakens data reliability and the quality of care (Alpert, DesRoches, & Kralovec, 2019). These weaknesses can affect clinical outcomes, particularly when a patient's full history needs to be available quickly.

Electronic Health Record Systems

Electronic Health Record systems offer a digital way of managing patient information across a healthcare setting. EHRs build a full, ongoing record of a patient's health that authorised providers can access and share in real time (Hoyt & Yoshihashi, 2020; Wager et al., 2021). These systems pull together clinical data from many visits, including demographic details, medical history, diagnoses, medication, laboratory results, and treatment plans.

EHR systems support better clinical decisions by giving providers quick access to accurate patient information. They improve how care is coordinated by allowing information to move smoothly between departments and institutions, which cuts down on repeated tests and reduces avoidable errors (Adler-Milstein & Jha, 2017). EHRs also support research, planning, and policy work by providing structured data that can be studied and evaluated (McGonigle & Mastrian, 2022). Clinical decision support tools built into EHR systems can also warn clinicians about drug interactions, deviations from guidelines, and missed opportunities for preventive care, which helps patient safety and the overall quality of service.

Even so, how well an EHR system works depends on adequate infrastructure, stable electricity, technical skill, and ongoing staff training. High costs, limits on interoperability, cybersecurity risks, and resistance to change can all get in the way of successful adoption, especially where resources are limited.

Hybrid Health Record Systems

Hybrid systems sit between paper and electronic record keeping, with both running side by side. This usually happens when a hospital brings in electronic systems gradually, because of financial limits, weak infrastructure, and the time it takes staff to adjust (Oachs & Watters, 2020; Wager et al., 2021). Patient information ends up split between paper files and electronic databases, creating two separate records that are never fully joined together.

Hybrid systems bring real inefficiencies into clinical work. Providers must check both paper and electronic sources to get a complete picture of a patient's history, which takes more time and breaks up the workflow. Without one unified system, clinical decisions suffer because information is not always available when it is needed (McBride & Tietze, 2018). Hospitals also have to maintain both physical and digital infrastructure at the same time, which raises costs and lowers overall efficiency (Hoyt & Yoshihashi, 2020). And because patient data is split across two formats, there is more room for documentation errors, missing information, and breaks in continuity of care.

Operational Difficulties in Healthcare Record Systems

Several operational problems stand in the way of implementing and using healthcare record systems well. Infrastructure issues, including unreliable electricity, inadequate ICT equipment, and poor internet access, all affect how well these systems perform (Adenuga, Ijatuyi, & Oluwole, 2021; Gbenga & Olaniyi, 2018). Money

problems limit how systems are bought, maintained, and how well staff are trained (Ezenwosu& Uzochukwu, 2019; Owolabi & Akinola, 2019). Human resource issues, including too little training, low ICT skill, and resistance to change among healthcare workers, add further obstacles to effective use (Nnaji & Okafor, 2021; Hassan & Ismail, 2018).

These problems tend to feed into each other, creating cycles of inefficiency that are hard to break. Weak infrastructure limits how effective training can be, while financial limits restrict both the technology a hospital can buy and the capacity it can build in its staff (Greenhalgh, Robert, Bate, Macfarlane, & Kyriakidou, 2004). Understanding how these challenges connect matters for building interventions that deal with root causes rather than symptoms. Taken together, these problems show up as poorer data quality, weaker patient safety, and hospitals that simply do not run as well as they could.

Theoretical Framework

This study draws on the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology to explain why systems get adopted and used the way they do. The Technology Acceptance Model holds that how useful a technology seems, and how easy it seems to use, are what drive people to accept it (Alalwan, Dwivedi, & Rana, 2017; Maillet, Mathieu, & Sicotte, 2015). The Unified Theory builds on this by adding social influence and facilitating conditions as further factors that shape how technology gets used inside an organisation (Venkatesh, Thong, & Xu, 2016; Williams, Rana, & Dwivedi, 2015).

Both frameworks fit healthcare record systems well, since how useful and how easy to use a system feels shapes whether staff actually adopt it. Facilitating conditions, such as available infrastructure, technical support, and training, matter greatly in deciding whether adoption turns into steady, effective use (Bozan, Parker, & Davey, 2016; Kruse, Kothman, Anerobi, &Abanaka, 2016). These frameworks help explain why some hospitals succeed in adopting digital record systems while others keep relying on older methods, even when everyone agrees the benefits are real.

METHODOLOGY

Research Design and Study Area

This study used a descriptive cross sectional survey design, carried out in three selected healthcare facilities in Bayelsa State, Nigeria: Federal Medical Centre Yenagoa, Yenagoa Hospital and Maternity in Kpansia, and Kolo General Hospital. These facilities operate at different levels of healthcare delivery and under different ownership models, which together give a fuller picture of how record systems are used across different institutional settings.

Study Context and Justification for Facility Selection

Bayelsa State sits in the South South geopolitical zone of Nigeria and has a healthcare landscape made up of public and private facilities at primary, secondary, and tertiary levels. According to the Bayelsa State Health Insurance Scheme, the state has 203 accredited healthcare facilities, made up of 97 hospitals and 106 health centres (Bayelsa State Ministry of Health, 2022). The Nigeria Health Facility Registry lists 311 health facilities across the state, which shows how varied and complex healthcare delivery is in this region (Federal Ministry of Health, 2021).

The three study facilities were chosen on purpose, to represent different tiers of healthcare delivery in Bayelsa State.

- Federal Medical Centre Yenagoa is a tertiary facility owned by the federal government. It provides specialised medical services and acts as a referral centre for the state and surrounding regions.

- Yenagoa Hospital and Maternity, in Kpansia, is a secondary level facility owned by the state. It provides general and maternity services to the urban population of Yenagoa.
- Kolo General Hospital is a secondary level facility set in a semi urban and rural area. It represents the kind of healthcare delivery found in the less urbanised parts of the state.

This selection was meant to capture the range of institutional characteristics, resources, and administrative structures that shape how healthcare record systems get adopted. These three facilities make up only 3.1 percent of the 97 hospitals in Bayelsa State, but together they reflect the tertiary, secondary urban, and secondary semi urban tiers of care found across the state. This fits the aim of the study, which is to compare record systems across different institutional settings rather than to produce a statistically representative survey of every facility in the state.

Population and Sample

The study population was made up of 98 Health Information Management professionals working across the selected facilities: 83 at Federal Medical Centre Yenagoa, 10 at Yenagoa Hospital and Maternity, and 5 at Kolo General Hospital. A total enumeration approach was used, and 94 valid questionnaires were returned, giving a response rate of 95.9 percent.

Data Collection Instrument

A structured questionnaire made up of three main sections was used to collect data. Section A recorded demographic details, Section B looked at the types of healthcare record systems in use, and Section C examined operational difficulties using a five point Likert scale, running from 1 for strongly disagree to 5 for strongly agree. The instrument was adapted from tools that have already been validated, including the WHO Health Information Technology Assessment tool (2021) and the EHR barriers scale developed by Kruse and colleagues (2016).

Validity and Reliability

Content and face validity were checked through review by academics working in Health Information Management and research methods. Reliability was tested through a pilot study using 10 percent of similar respondents, and every construct achieved a Cronbach's Alpha of 0.70 or higher.

Data Analysis

Data were analysed using SPSS version 26.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were worked out for categorical items and Likert scale items. Chi square tests were used to check associations between variables, with significance set at p less than 0.05.

Ethical Considerations

Ethical approval came from the Research Ethics Committee of Federal University Otuoke Business School and the Bayelsa State Ministry of Health. Every participant gave written informed consent, and responses were kept anonymous to protect confidentiality.

Study Limitations

This study covered only three hospitals in Bayelsa State, which is 3.1 percent of the state's 97 hospitals, so the findings cannot be generalised to other healthcare facilities across Nigeria. The study also relied only on Health Information Management professionals, which means it may miss the views of clinicians, administrators, technical staff, or patients, all of whom interact with these record systems too. Because the study is descriptive, it cannot establish cause and effect between operational challenges and outcomes such as workflow efficiency, data quality, or patient care. Future research should widen its geographic reach, involve more and more varied facilities, and bring in the perspectives of multiple stakeholders.

ISSNNo. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue XV July 2026 | Issue on Public Health

RESULTS

4.1 Demographic Characteristics of Respondents

Table 4.1: Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Age	20 to 29 years	24	25.5
	30 to 39 years	41	43.6
	40 to 49 years	19	20.2
	50 years and above	10	10.6
Gender	Male	38	40.4
	Female	56	59.6
Educational Qualification	Diploma in Health Information Management	31	33.0
	Bachelor's Degree in Health Information Management	48	51.1
	Master's Degree in Health Information Management	9	9.6
	Other Qualifications	6	6.4
Years of Experience	Less than 2 years	12	12.8
	2 to 5 years	28	29.8
	6 to 10 years	31	33.0
	Above 10 years	23	24.5

Interpretation

Table 4.1 sets out the demographic profile of the 94 respondents who took part in this study. Respondents aged 30 to 39 years made up the largest group, at 41 respondents, or 43.6 percent. Those aged 20 to 29 years came next, at 24 respondents, or 25.5 percent, while those aged 40 to 49 and those aged 50 and above made up 19 (20.2 percent) and 10 (10.6 percent) of the sample. This shows that most respondents fell within the active working age population.

On gender, 56 respondents, or 59.6 percent, were female, while 38, or 40.4 percent, were male. Women therefore formed the majority of participants in this study.

On education, just over half of respondents, 48 or 51.1 percent, held a Bachelor's Degree in Health Information Management. Another 31, or 33.0 percent, held a Diploma in the same field, 9, or 9.6 percent, held a Master's Degree, and 6, or 6.4 percent, held other qualifications. This suggests that most participants had the training needed to give informed answers to the survey.

On work experience, 31 respondents, or 33.0 percent, had between 6 and 10 years of experience, 28, or 29.8 percent, had 2 to 5 years, 23, or 24.5 percent, had more than 10 years, and 12, or 12.8 percent, had less than 2

years. This spread of experience gave the study a balanced view of Electronic Health Record adoption and how it shapes institutional effectiveness.

4.2 Types of Healthcare Record Systems in Use

Table 4.2: Distribution of Healthcare Record Systems Across the Selected Facilities

Facility	Paper Based Only	Fully Electronic (EHR)	Hybrid System	Total
FMC Yenagoa	81 (100%)	0 (0%)	0 (0%)	81
Yenagoa Hospital and Maternity	0 (0%)	8 (100%)	0 (0%)	8
Kolo General Hospital	0 (0%)	0 (0%)	5 (100%)	5
Total	81 (86.2%)	8 (8.5%)	5 (5.3%)	94

Interpretation

Table 4.2 shows how healthcare record systems are distributed across the selected facilities. All 81 respondents at Federal Medical Centre Yenagoa, 100 percent, reported using a paper based system, which tells us that electronic health records had not yet been put in place at that facility when the study was carried out. At Yenagoa Hospital and Maternity, all 8 respondents, again 100 percent, reported using a fully electronic health record system. At Kolo General Hospital, all 5 respondents, also 100 percent, said their facility ran a hybrid system that combined paper and electronic records.

Across the whole sample, 81 respondents, or 86.2 percent, worked in facilities relying only on paper records, while 8, or 8.5 percent, worked where EHRs had been fully adopted. The remaining 5, or 5.3 percent, worked under a hybrid system. Paper based record management is clearly still the dominant practice among these hospitals, even though some facilities have moved to fully electronic or hybrid systems. This spread points to real differences between facilities in infrastructure, funding, institutional policy, and how ready each one is for new technology.

Table 4.3: Availability of Electronic Health Record Features (n = 91)

EHR Feature	Frequency	Percentage (%)
Patient registration	76	80.9
Clinical notes	58	61.7
Laboratory results	45	47.9
Electronic prescribing	38	40.4
Billing system	52	55.3
Data backup	29	30.9
Interoperability	6	6.4

Interpretation

Table 4.3 shows which Electronic Health Record features were available among the facilities that had adopted them, out of 91 respondents. Patient registration was the most widely available feature, reported by 76

respondents, or 80.9 percent. Clinical notes came next, available to 58 respondents, or 61.7 percent, followed by billing systems at 52 respondents, or 55.3 percent. Laboratory results were available to 45 respondents, or 47.9 percent, and electronic prescribing to 38, or 40.4 percent.

Data backup was available to only 29 respondents, or 30.9 percent, which suggests that many facilities lack proper safeguards for protecting electronic health information. Interoperability was the least available feature, reported by only 6 respondents, or 6.4 percent, showing that very few facilities can exchange patient information with other institutions.

Taken together, these findings suggest that the EHR systems in place mainly support basic administrative and clinical tasks, while more advanced capabilities, interoperability above all, remain underdeveloped. This points to a real need for greater investment in integrated digital health infrastructure, both to improve how information is shared and to strengthen continuity of care.

4.3 Operational Difficulties Associated with Healthcare Record Systems

Table 4.4a: Top Five Operational Difficulties by Mean Score

Rank	Challenge	Mean Score
1	Unstable electricity supply	4.62
2	Insufficient maintenance funding	4.55
3	Inadequate training	4.50
4	Duplication of data entry	4.48
5	Insufficient computers	4.41

Table 4.4: Operational Difficulties Associated with Healthcare Record Systems (n = 94)

Item	Statement	Mean	SD
	Infrastructure Factors		
C1	Unstable electricity disrupts system use	4.62	0.58
C2	Inadequate number of computers	4.41	0.67
C3	Poor internet connectivity	4.38	0.71
C4	Lack of IT support staff	4.35	0.69
C5	Limited storage space for paper records	4.23	0.74
	Training and Skills		
C6	Inadequate training on record systems	4.50	0.62
C7	Low ICT literacy among staff	4.31	0.70
C8	Lack of refresher training	4.28	0.73
C9	Difficulty using the system interface	4.15	0.78

	Financial Constraints		
C10	Insufficient funding for system maintenance	4.55	0.61
C11	High cost of software and licensing	4.32	0.68
C12	Limited budget for ICT infrastructure	4.26	0.72
	Organisational Factors		
C13	Resistance to change	4.08	0.81
C14	Fear of increased workload	3.95	0.84
C15	Weak management support	3.87	0.86
C16	Low motivation to adopt technology	3.72	0.89
	System Design Issues		
C17	Frequent system failures	4.20	0.76
C18	Poor integration across departments	4.10	0.79
C19	Duplication of data entry	4.48	0.65
C20	Difficulty retrieving paper records	4.34	0.70

Interpretation

Table 4.4 sets out how respondents rated the operational difficulties tied to healthcare record systems across the selected hospitals. All twenty items scored above the benchmark of 3.00, showing that respondents agreed each of these issues posed a real challenge to managing records well.

Among infrastructure related factors, unstable electricity supply ranked highest, with a mean of 4.62 and a standard deviation of 0.58. This was followed by an inadequate number of computers (mean 4.41, SD 0.67), poor internet connectivity (mean 4.38, SD 0.71), a lack of IT support staff (mean 4.35, SD 0.69), and limited storage space for paper records (mean 4.23, SD 0.74). These results show that weak infrastructure remains a real obstacle to running healthcare record systems well.

On training and staff capacity, respondents agreed that inadequate training (mean 4.50, SD 0.62), low ICT literacy (mean 4.31, SD 0.70), a lack of refresher training (mean 4.28, SD 0.73), and difficulty using the system interface (mean 4.15, SD 0.78) all got in the way of using record systems effectively.

Financial constraints also stood out as a major challenge. Insufficient funding for system maintenance scored a mean of 4.55 (SD 0.61), while the high cost of software and licensing (mean 4.32, SD 0.68) and limited budgets for ICT infrastructure (mean 4.26, SD 0.72) were both rated highly.

On organisational factors, resistance to change (mean 4.08, SD 0.81), fear of a heavier workload (mean 3.95, SD 0.84), weak support from management (mean 3.87, SD 0.86), and low motivation to adopt new technology (mean 3.72, SD 0.89) were all named as barriers to successful adoption.

On system design, respondents agreed that duplicating data entry (mean 4.48, SD 0.65), difficulty retrieving paper records (mean 4.34, SD 0.70), frequent system failures (mean 4.20, SD 0.76), and weak integration across departments (mean 4.10, SD 0.79) all worked against good record management.

Table 4.4a lists the five most serious challenges overall, ranked by mean score: unstable electricity supply, insufficient maintenance funding, inadequate training, duplication of data entry, and a shortage of computers. Together, these findings point to weak infrastructure, poor funding, thin staff training, and system design

problems as the main operational obstacles facing healthcare record systems in these hospitals. Left unaddressed, these problems are likely to keep efficiency low, limit the gains digital health technology could otherwise bring, and slow down improvements at the institutional level.

4.4 Association Between Facility Type and Healthcare Record System

Table 4.5: Chi Square Test of Association Between Facility Type and Healthcare Record System

Variable	Chi Square	df	p value
Facility Type x Healthcare Record System	88.24	4	less than 0.001

Interpretation

Table 4.5 sets out the results of the chi square test examining whether facility type and the type of healthcare record system used are related. The test produced a chi square value of 88.24, with 4 degrees of freedom and a p value below 0.001.

Because this p value falls below the 0.05 significance level, the null hypothesis of no association is rejected. There is a statistically significant relationship between the type of health facility and the record system it uses. In other words, the record system a facility adopts differs in a meaningful way depending on the type of facility it is.

This tells us that adoption of healthcare record systems is shaped by the characteristics of each individual institution, rather than happening uniformly everywhere. Facilities with stronger institutional capacity, better infrastructure, and firmer administrative backing are more likely to run electronic or hybrid systems, while facilities with fewer resources tend to stay with paper. This underlines how much institutional readiness matters for the successful adoption of Electronic Health Record systems.

DISCUSSION

The findings of this study point to clear differences in how healthcare record systems have been adopted across the selected hospitals in Bayelsa State. Federal Medical Centre Yenagoa depends entirely on paper records, Yenagoa Hospital and Maternity has moved fully to Electronic Health Records, and Kolo General Hospital runs a hybrid system that blends paper and electronic records. These differences show that hospitals sit at different stages of digital transformation, and suggest that EHR adoption depends heavily on available resources, management commitment, technological infrastructure, and institutional readiness.

Comparing Adoption Patterns Across Facilities

Comparing how each facility has adopted record systems is worth a closer look. Federal Medical Centre Yenagoa, despite being the largest facility and a federal tertiary hospital with substantial resources, remains entirely paper based. This is not what one might expect. Institutional size and federal backing clearly do not guarantee readiness for digital systems on their own. Possible reasons include bureaucratic delay, competing demands on federal funding, or the absence of a mandated digital health policy at the federal level. By contrast, Yenagoa Hospital and Maternity, a smaller state owned secondary facility, has achieved full EHR adoption. This suggests that state level administrative freedom, strong institutional leadership, and organisational flexibility may matter more for successful digital transformation than facility size or funding alone. Kolo General Hospital's hybrid system reflects a transitional stage, showing awareness of what digitalisation offers but also the resource limits that hold it back. What this variation shows is that digital health policy needs to be tailored to institutional context, rather than applying the same approach to every facility.

This variation fits with earlier studies, which found that healthcare institutions in developing countries adopt digital health technology at different speeds because of differences in funding, infrastructure, and organisational capacity (Afolabi & Adebayo, 2021; Kruse et al., 2018). That Federal Medical Centre Yenagoa still relies on paper records shows that even large public hospitals can struggle to implement digital health

systems. On the other hand, that Yenagoa Hospital and Maternity has fully adopted EHRs suggests that adequate funding, effective management, and organisational flexibility can support successful implementation. Still, given how few facilities this study examined, these patterns should not be generalised too broadly to all Nigerian hospitals.

The study also found several operational challenges affecting how well healthcare records are managed. Unstable electricity supply came out as the most serious of these. Frequent power cuts disrupt electronic systems, delay service, increase downtime, and often push healthcare workers back to manual documentation. This has real consequences for clinical care, since power outages can delay access to critical patient information during emergencies, threaten the accuracy of medication administration, and interrupt clinical workflow. Similar findings turn up in earlier Nigerian studies, which named unreliable electricity as a major barrier to digital health implementation (Adenuga et al., 2021; Gbenga & Olaniyi, 2018).

Money problems also stood out as a real barrier to EHR adoption. Respondents pointed to inadequate maintenance funding, limited ICT infrastructure, and high costs for software and licensing. These issues limit how well hospitals can buy, maintain, and upgrade electronic systems. The financial burden does not stop at initial setup either. Ongoing costs for system updates, technical support, and staff training all need sustained budget commitment. Earlier studies have found much the same thing, that inadequate funding remains one of the biggest constraints on sustainable digital health programmes in developing countries (Ezenwosu& Uzochukwu, 2019; Owolabi & Akinola, 2019).

Another important finding was the lack of adequate training for healthcare workers. Many respondents agreed that too little training, low ICT skill, and the absence of regular refresher courses limited how well healthcare record systems could be used. Without the right knowledge and skill, staff struggle to operate EHR systems properly, which lowers use and cuts into the benefits these systems could bring. This matches earlier studies that stressed continuous staff training as key to successful EHR implementation (Nnaji & Okafor, 2021; Hassan & Ismail, 2018). The link between weak training and low system use suggests that investing in people matters just as much as investing in technology.

The study also found that hybrid record systems add extra workload through duplicated data entry. Healthcare workers must record the same patient information twice, once on paper and once electronically, which takes more time and opens the door to errors and inconsistencies. This duplication cuts into workflow efficiency and puts data quality and patient safety at risk. While hybrid systems may serve as a step on the way from paper to fully electronic records, keeping them in place too long can end up doing more harm than good (Kruse et al., 2017; McBride & Tietze, 2018).

The chi square analysis found a statistically significant relationship between facility type and the record system in use. This tells us that EHR adoption is closely tied to the characteristics and capacity of each individual healthcare institution. Hospitals with stronger infrastructure, better funding, and firmer administrative backing are more likely to run electronic or hybrid systems than those with fewer resources. Policies aimed at expanding EHR adoption should recognise these differences and offer implementation strategies suited to each facility's specific needs and capacity.

These findings also support the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology. The challenges identified here, weak infrastructure, limited funding, and thin staff training, all reduce the conditions needed for EHR systems to be adopted and kept in use. Healthcare workers may well see the benefits of electronic health records, but poor facilitating conditions still hold back how much they can actually use them. Improving infrastructure, strengthening technical support, providing steady funding, and investing in ongoing staff training are therefore all essential if EHR implementation is to succeed and last.

Implications for Policy and Practice

The findings of this study carry real implications for healthcare policy, institutional practice, and future research into digital health transformation.

Policy Implications

- Differentiated implementation strategies. The variation in EHR adoption across the three facilities shows that a single, uniform approach to digital health policy is unlikely to succeed. Policymakers should build tiered implementation frameworks that recognise how tertiary, secondary, and primary facilities differ in capacity, and pair these with phased targets, flexible timelines, and resource allocation that matches how ready each institution actually is.

- Infrastructure investment first. Since unstable electricity supply came out as the most serious operational challenge, digital health investment should come alongside, or even before, improvements to basic infrastructure. Policymakers should look at public private partnerships for solar power, backup generators, and better internet connectivity as groundwork for EHR implementation.

- Funding mechanisms. The financial constraints found in this study show that one time capital investment is not enough to sustain EHR implementation. Policymakers should set up recurring budget lines for system maintenance, software updates, and staff training, and explore financing options such as dedicated digital health levies, public private partnerships, and international development support.

Practice Implications

- Organisational readiness assessment. Hospital administrators should assess institutional readiness before starting EHR implementation, looking at infrastructure, staff skill, financial capacity, and organisational culture. The finding that Federal Medical Centre Yenagoa remains paper based despite being a federal tertiary facility shows why readiness assessments need to identify the barriers and enablers specific to each institution.

- Capacity building. The training gaps found in this study suggest that hospitals should move toward competency based training rather than one off workshops. Continuous professional development, on the job training, and peer mentoring should become part of routine practice, and training should address both technical skill and the resistance that often comes with change.

- Transition planning. Facilities currently running hybrid systems should build clear plans for moving to full EHR implementation within a set timeframe. Staying on hybrid systems too long creates inefficiency through duplicated data and higher costs. Transition plans should include staff engagement, infrastructure upgrades, and clear milestones.

Research Implications

- Wider scope. Future research should move beyond Bayelsa State to cover multiple states across Nigeria's geopolitical zones, comparing states with different levels of digital health investment to better understand what drives or blocks EHR adoption.

- Mixed methods. Because this study relied on quantitative survey data, it does not capture the lived experience of healthcare workers and patients. Interviews and focus group discussions would add rich, contextual understanding of what helps and what gets in the way.

- Outcome evaluation. Future studies should look at how different record systems affect clinical outcomes, including medication errors, continuity of care, patient satisfaction, and institutional efficiency, to build a stronger case for investment in EHR systems.

- Longitudinal studies. This study offers a snapshot of current practice. Tracking facilities over time as they move from paper to hybrid to fully electronic systems would give valuable insight into how digital transformation actually unfolds.

CONCLUSION

This study concludes that healthcare record management in the selected hospitals in Bayelsa State falls into three levels of adoption: paper based, fully electronic, and hybrid. The level of adoption differs across facilities, reflecting differences in institutional readiness, infrastructure, financial capacity, and administrative support. Although some facilities have successfully implemented Electronic Health Records, paper based records remain the dominant method of documentation. This points to a gradual but uneven digital transformation, with institutional characteristics playing a deciding role in how ready each facility is. The finding that the largest facility, Federal Medical Centre Yenagoa, remains entirely paper based, while a smaller facility, Yenagoa Hospital and Maternity, has achieved full EHR implementation, shows just how much institutional leadership, administrative freedom, and organisational culture matter for digital transformation.

The study also concludes that several operational challenges constrain how well healthcare record systems can be implemented and used. These include unstable electricity supply, inadequate funding, limited ICT infrastructure, insufficient staff training, a shortage of technical support, and duplication of data entry under hybrid systems. Together, these challenges reduce operational efficiency, limit how much benefit electronic health technology can actually deliver, and slow the move from paper based to fully digital healthcare records. The effect of these challenges reaches beyond administrative inconvenience, touching clinical decision making, patient safety, and the quality of service.

The significant relationship found between facility type and healthcare record system shows that institutional characteristics play an important part in shaping how far EHR adoption goes. Successful digital transformation will therefore need interventions built around the specific needs and capacity of each healthcare facility. These should include better power supply, greater investment in ICT infrastructure, sustainable funding for system maintenance, ongoing training for healthcare workers, stronger technical support, and policy that supports a gradual move toward integrated, interoperable EHR systems. Putting these measures in place would improve healthcare record management and raise the quality, efficiency, and effectiveness of healthcare service delivery in Bayelsa State.

It is worth acknowledging that the findings of this study are limited to the three hospitals investigated, representing only 3.1 percent of the hospitals in Bayelsa State. While the selected facilities offer useful insight into how record systems work across different institutional levels, the results may not apply to all healthcare facilities in the state or across Nigeria. The perspectives of other stakeholders, including clinicians, administrators, technical staff, and patients, were not captured here, and including them would give a fuller picture of how effective these record systems really are.

RECOMMENDATIONS

Giving the findings of this study, the following recommendations are proposed.

- The Federal and Bayelsa State Governments should invest in reliable electricity supply and adequate ICT infrastructure to support successful and lasting implementation of Electronic Health Record systems. Alternative energy sources, such as solar power and standby backup systems, should be provided to reduce power interruptions, and reliable internet connectivity should be extended to all healthcare facilities. This investment matters for cutting system downtime and keeping patient information accessible.

- Healthcare institutions should provide regular, ongoing training for Health Information Management professionals and other healthcare workers on how to use EHR systems effectively. Training should focus on building ICT skill, raising user competence, and building confidence in digital health technology, with continuous professional development to keep pace as systems evolve.

- Every healthcare facility should set up or strengthen a dedicated ICT support unit, staffed by qualified technical personnel responsible for system maintenance, software updates, troubleshooting, data

security, and user support. This would reduce downtime and improve how reliable and efficient healthcare record systems are.

- The Federal Ministry of Health, working with relevant regulatory agencies and healthcare institutions, should develop a phased policy for moving from paper based and hybrid record systems to fully integrated, interoperable Electronic Health Record systems. This policy should set out clear implementation guidelines, performance targets, monitoring mechanisms, and adequate funding to support successful adoption across different categories of healthcare facility, taking into account the variation in readiness this study found.

- Hospital administrators should set aside adequate financial resources for the purchase, maintenance, upgrading, and long term sustainability of EHR systems. Regular investment in ICT infrastructure and software maintenance would improve system performance and keep service delivery running smoothly. Innovative financing options, including public private partnerships, should be explored to supplement government funding.

- Future studies should examine the long term impact of EHR adoption on healthcare quality, patient outcomes, staff productivity, and institutional effectiveness, across a wider range of healthcare facilities in Nigeria. These studies should use mixed methods that bring in the views of clinicians, administrators, IT personnel, and patients, to build a fuller picture of how effective record systems really are. Research should also look at how different record systems affect clinical workflow, data accuracy, reporting, and patient outcomes across different healthcare settings. Widening the geographic scope beyond Bayelsa State would strengthen how far these findings can be generalised and would help shape national digital health policy. Longitudinal studies that follow facilities through different stages of adoption would offer valuable insight into how digital transformation unfolds and what helps it succeed.

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