Vol. 7(4), pp. 86-95, October 2026
https://doi.org/10.14662/arjhim2026400
Copy©right 2026
Author(s) retain the copyright of this article
ISSN: 2734-2190
https://www.academicresearchjournals.org/ARJHIM/Index.htm

Academic Research Journal on Health Information Management

Full length Research

Availability of Electronic Health Records and Its Effect on Patient Waiting Time in a Nigerian Tertiary Hospital: Evidence from University of Ilorin Teaching Hospital, Ilorin

[1]I. O Salihu and [2]Umar Faruk Abubakar

[1]Department of Health Information Management, Kwara State University.
Corresponding author's E-mail: Toyeenibraheem@Gmail.Com,_Orcid Id: 0009-0003-8991-3585
[2]Federal University of Health Sciences Azare, Bauchi State, Nigeria. E-mail: Famzarab@Gmail.Com

Accepted 19 October 2026

Background: Prolonged patient waiting time remains a persistent problem in Nigerian tertiary hospitals, where manual record handling, repeated registration and slow retrieval of case notes create bottlenecks at almost every service point. Electronic health records (EHR) are expected to shorten these delays, but evidence from Nigerian teaching hospitals is limited.
Objective: This study assessed the availability of EHR and its effect on patient waiting time at the University of Ilorin Teaching Hospital (UITH), Ilorin, Kwara State, Nigeria.
Methods: A descriptive cross-sectional survey was conducted among healthcare professionals (Health Information Management staff, nurses, doctors, laboratory scientists and pharmacists). From a population of 1,481, a sample of 315 was determined using the Taro Yamane formula and allocated proportionately across professional groups. A validated structured questionnaire (Cronbach's $\alpha = 0.76$) was used. Data from 286 valid questionnaires (response rate 90.8%) were analysed using frequencies, percentages, means, standard deviations and the chi-square test of independence at $p < 0.05$, with odds ratio and phi coefficient as measures of effect size.
Results: Most respondents (79.0%) used EHR daily. EHR were available in respondents' departments ($M = 3.23$, $SD = 0.80$), but use across all hospital departments was rated lowest among availability items ($M = 2.65$, $SD = 0.97$), and frequent downtime or slow loading was reported ($M = 3.07$). EHR had a positive effect on patient waiting time (grand mean = 3.06). The strongest effects were faster access to medical histories ($M = 3.30$; 86.7% agreement) and improved patient registration ($M = 3.21$; 83.9%), while improvements in appointment scheduling ($M = 2.89$) and patient-noticed reductions in waiting time ($M = 2.83$) were weaker. Daily EHR use was significantly associated with perceived reduction in waiting time ($\chi^2 = 22.11$, $df = 1$, $p < 0.001$; OR = 4.36, 95% CI 2.29–8.29; $\varphi = 0.28$).
Conclusion: EHR at UITH reduce waiting time mainly by removing record-retrieval and registration bottlenecks. Uneven departmental coverage, weak scheduling functions and system downtime limit the gains. Full hospital-wide deployment, stronger scheduling modules and reliable infrastructure are recommended.

Keywords: Electronic health records; patient waiting time; patient flow; health information management; tertiary hospital; Nigeria

Cite This Article As: Salihu, IO., Abubakar, UF (2026). Availability of Electronic Health Records and Its Effect on Patient Waiting Time in a Nigerian Tertiary Hospital: Evidence from University of Ilorin Teaching Hospital, Ilorin. Acad. Res. J. Health. Inform. Manage. 7(4):86-95

INTRODUCTION

Timeliness is one of the six aims of high-quality healthcare identified by the Institute of Medicine (2001), alongside safety, effectiveness, patient-centredness, efficiency and equity. In many low- and middle-income countries, however, timeliness remains the weakest of these aims. Patients attending Nigerian tertiary hospitals often spend several hours between arrival and consultation, much of it waiting for registration, retrieval of case notes, and transfer of information between service points (Ofili & Ofovwe, 2005; Oche & Adamu, 2013). Long waits reduce patient satisfaction, discourage follow-up attendance and may delay diagnosis and treatment, with consequences for clinical outcomes (Ahmad, Khairatul & Farnaza, 2017).

A large share of this delay originates in the medical records system. In paper-based hospitals, a patient's folder must be physically located, retrieved from a central records library, carried to the clinic and returned after use. Folders are misplaced, duplicated or filed incorrectly, and patients are sometimes asked to open new folders because old ones cannot be found. Studies of outpatient waiting in Nigerian hospitals have consistently identified records retrieval and registration as major contributors to waiting time (Oche & Adamu, 2013; Ameh, Sabo & Oyefabi, 2013).

Electronic health records are digital, longitudinal records of patients' health information, accessible to authorised users across departments and over time (World Health Organization [WHO], 2021). By capturing demographic and clinical information once and making it instantly retrievable, EHR are expected to shorten registration, eliminate folder retrieval, speed up the flow of laboratory results and improve appointment scheduling (Buntin, Burke, Hoaglin & Blumenthal, 2011). Nigeria's National Health ICT Strategic Framework identifies EHR as a central component of health system strengthening (Federal Ministry of Health, 2016), and several federal teaching hospitals have introduced EHR in some or all of their departments.

The expected time savings are not automatic. Systematic reviews show that EHR can increase documentation time for clinicians, particularly during early implementation (Poissant, Pereira, Tamblyn & Kawasumi, 2005), and a time-and-motion study in primary care found no overall difference in visit duration between EHR and paper-based centres, although registration time fell sharply once web-based booking was added (Jabour, 2020). In sub-Saharan Africa, unreliable electricity, poor connectivity and partial deployment further limit the benefits (Akanbi et al., 2012; Odekunle, Odekunle & Shankar, 2017). The effect of EHR on waiting time therefore needs to be established empirically in each setting.

University of Ilorin Teaching Hospital (UITH) is a major federal tertiary hospital in North-Central Nigeria that has implemented EHR in several departments. No published study has assessed how available the system is to frontline professionals or whether its use is associated with reduced waiting time. This study addresses that gap.

Objectives

The study sought to:

1. Determine the availability of electronic health records at UITH.
2. Examine the effect of electronic health records on patient waiting time at UITH.
3. Test the relationship between daily EHR use and perceived reduction in patient waiting time.

1.2 Hypothesis

H_{01}: There is no significant relationship between the use of electronic health records and patient waiting time at UITH.

LITERATURE REVIEW

Patient Waiting Time in Nigerian Hospitals

Patient waiting time is the interval a patient spends waiting for service, from arrival or registration to first contact with a healthcare provider, and between subsequent service points such as the laboratory and pharmacy. In a tertiary hospital in north-western Nigeria, Oche and Adamu (2013) found that most outpatients waited more than an hour before seeing a doctor, with records retrieval among the main determinants. Ofili and Ofovwe (2005) reported that patients at a Nigerian teaching hospital rated the efficiency of services poorly, citing delays at the records and registration points. Ameh et al. (2013), applying queuing theory in a Nigerian tertiary hospital, showed that waiting time is a key driver of patient dissatisfaction and that process redesign at bottleneck points can reduce it. These studies point to the information system, rather than clinical workload alone, as a major source of delay.

How EHR Can Reduce Waiting Time

The literature identifies four main mechanisms through which EHR can shorten waiting time.

Faster registration. In paper systems, each visit may require manual completion and verification of forms. EHR store patient demographic details once and allow returning patients to be identified and registered quickly by hospital number or name (Menachemi & Collum, 2011).

Instant retrieval of medical histories. EHR eliminate the physical search for folders. Clinicians can see previous diagnoses, medications and investigation results at the point of care, removing a delay that in paper systems can take from minutes to hours (Buntin et al., 2011).

Faster flow of orders and results. Electronic laboratory and radiology requests reach the relevant department immediately, and results are visible to clinicians once validated, avoiding the wait for paper reports to be carried back to clinics (Chaudhry et al., 2006).

Appointment scheduling and patient flow management. Scheduling modules can spread appointments across the day, reduce clustering of patients at opening time and, in some systems, send reminders. Jabour (2020) observed that registration time in Saudi primary care centres fell from 5.5 to 0.9 minutes after web-based booking linked to the EHR was introduced.

Evidence of Mixed Effects

Not all studies show time savings. EHR can create new delays when they are introduced without changes to the surrounding workflow. Menachemi and Collum (2011) noted that productivity often falls temporarily after implementation as staff learn new procedures, and that poorly configured systems can add steps to routine tasks. When registration is computerised but consultation, laboratory and pharmacy processes remain partly manual, patients may still wait for paper forms to move between points, and staff may duplicate work by recording the same information on paper and on the computer. EHR may also slow consultations if clinicians must navigate many screens or enter extensive structured data. These findings suggest that EHR reduce administrative delay more reliably than clinical consultation time, and that the net effect on waiting depends on system design, user skill and workflow integration.

EHR in Sub-Saharan Africa

Reviews of EHR in low-resource settings report that implementation is frequently partial, with systems deployed in some departments but not others, and with paper records continuing in parallel (Williams & Boren, 2008; Ohuabunwa, Sun, Jubanyik & Wallis, 2016). Fritz, Tilahun and Dugas (2015) identified reliable power, network infrastructure, user training and management commitment as critical success factors. Odekunle et al. (2017) attributed slow adoption in sub-Saharan Africa to high costs, poor infrastructure and limited computer skills. Partial implementation matters for waiting time because a patient whose journey crosses an EHR-enabled clinic and a paper-based laboratory may still experience the delays of the paper system.

Empirical Studies on EHR and Time Efficiency

Empirical studies on EHR and time use have produced a consistent picture: administrative and information-retrieval tasks become faster, while clinical documentation may become slower. In their systematic review of 23 studies, Poissant et al. (2005) found that nurses' documentation time fell substantially when EHR were used at the bedside, while physicians' documentation time often rose, particularly with desktop systems. Sinsky et al. (2016) observed physicians in four specialties in the United States and found that they spent about 27% of their office day on direct face time with patients and 49% on EHR and desk work. These studies show that EHR redistribute time between tasks rather than simply saving it.

Studies that focus on the patient's experience of waiting are fewer. Jabour (2020), using time-and-motion observation in Saudi primary care centres, found no significant difference in the time patients spent at reception, in the waiting area, in consultation or at the pharmacy between EHR and paper-based centres. Registration time nevertheless fell from 5.5 to

0.9 minutes after a web-based booking system was added. In Nigerian outpatient settings, Oche and Adamu (2013) found that most patients waited over an hour to see a doctor and identified the time spent retrieving records and the number of doctors on duty as determinants. Taken together, this evidence suggests that EHR should reduce waiting time most clearly at registration and records retrieval, while the effect on total time in hospital depends on what happens at other service points.

Theoretical Framework

The study is guided by the DeLone and McLean Information Systems Success Model (DeLone & McLean, 2003). The model proposes that system quality, information quality and service quality influence system use and user satisfaction, which in turn produce net benefits for individuals and organisations. In this study, EHR availability reflects the system's presence and accessibility (a precondition of system quality and use), daily EHR use represents the "use" construct, and reduced patient waiting time is one of the organisational "net benefits". The model also explains why technical problems such as downtime and slow loading, which lower system quality, are expected to weaken the benefits of EHR. The Technology Acceptance Model (Davis, 1989) complements this view by suggesting that professionals who find the system useful and easy to use will use it more often, increasing the likelihood of time savings.

Gap in Literature

Most evidence on EHR and waiting time comes from high-income countries with mature, hospital-wide systems. Nigerian studies of waiting time have largely examined paper-based hospitals, while Nigerian EHR studies have focused on adoption and barriers rather than on service timeliness. There is little evidence from Nigerian teaching hospitals on how available EHR are to frontline professionals and whether their use is associated with shorter waiting time.

METHODOLOGY

Study Design and Setting

A descriptive cross-sectional survey design was adopted. The study was conducted at University of Ilorin Teaching Hospital (UITH), Ilorin, Kwara State, a federal tertiary hospital that provides outpatient, inpatient, surgical, emergency and diagnostic services and serves as a referral centre for Kwara State and neighbouring states. UITH has implemented EHR in several departments, making it suitable for examining the effect of the system on service delivery.

Population and Sample

The population comprised 1,481 healthcare professionals in five groups that interact with patient records during service delivery: nurses (745), doctors (475), Health Information Management (HIM) staff (127), laboratory staff (71) and pharmacy staff (63). The inclusion criteria were membership of these groups, availability during data collection and consent to participate.

The sample size was determined using the Taro Yamane (1967) formula, $n = N / [1 + N(e)^2]$, with $N = 1,481$ and $e = 0.05$, giving $n = 315$. The sample was allocated proportionately to professional groups (Table 1). Respondents within each group were selected from those on duty and willing to participate during the data collection period.

Table 1: Population, Proportional Sample and Valid Responses by Professional Group

Professional group	Population	Proportional sample	Valid responses	Response rate (%)
Nursing	745	158	144	91.1
Doctors	475	101	92	91.1
Health Information Management	127	27	24	88.9
Laboratory	71	15	14	93.3
Pharmacy	63	14	12	85.7
Total	1,481	315	286	90.8

Instrument

Data were collected with a self-administered structured questionnaire. Section A captured demographic information and EHR experience, including whether the respondent used EHR daily. Section B contained five items on EHR availability, and Section C contained six items on the effect of EHR on patient waiting time. Items were rated on a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2) and Strongly Disagree (1).

Content validity was established by experts in health information management and medical statistics, and the instrument was pretested in a comparable hospital. Ambiguous items were revised. Internal consistency was acceptable, with Cronbach's alpha of 0.76 (Nunnally, 1978).

Data Collection and Analysis

Questionnaires were distributed and retrieved over one week, with respondents completing them outside clinical duties to avoid disruption of patient care. Data were analysed with SPSS version 25. Frequencies, percentages, means and standard deviations were computed. A mean of 2.50 was used as the criterion: items with $M \geq 2.50$ were accepted as agreement. For hypothesis testing, respondents were cross-classified by daily EHR use (yes/no) and by perceived reduction in waiting time (agreed/disagreed), and the chi-square test of independence was applied at $\alpha = 0.05$. The odds ratio with 95% confidence interval and the phi coefficient were computed as measures of effect size, with φ of 0.10, 0.30 and 0.50 interpreted as small, medium and large (Cohen, 1988).

Ethical Considerations

Ethical approval was obtained from the UITH Ethics Research Committee. Respondents gave informed consent, participation was voluntary, and anonymity and confidentiality were maintained.

RESULTS

Characteristics of Respondents

Table 2: Socio-demographic Characteristics and EHR Experience of Respondents (N = 286)

Variable	Category	Frequency	Percentage (%)
Age (years)	18–25	18	6.3
	26–35	73	25.5
	36–45	96	33.6
	46–55	68	23.8
	56 and above	31	10.8
Gender	Male	128	44.8
	Female	158	55.2
Highest qualification	SSCE	8	2.8
	ND	43	15.0
	BSc/HND	151	52.8
	MSc	71	24.8
	PhD	13	4.5
Experience with HER	None	15	5.2
	Less than 1 year	32	11.2
	1–2 years	72	25.2
	3–5 years	94	32.9
	More than 5 years	73	25.5
Daily EHR use	Yes	226	79.0
	No	60	21.0

Table 2 shows that respondents were mostly aged 26–55 years (82.9%), and slightly more were female (55.2%). Over four-fifths held at least a first degree or HND. Most respondents had substantial EHR experience: 58.4% had used EHR for three years or more, and 79.0% used EHR daily. Only 5.2% had no EHR experience.

Availability of EHR

Table 3: Availability of Electronic Health Records at UITH (N = 286)

S/N	Statement	SA n (%)	A n (%)	D n (%)	SD n (%)	Mean	SD	Decision
1	EHR are available for use in my department	119 (41.6)	126 (44.1)	28 (9.8)	13 (4.5)	3.23	0.80	Agreed
2	The hospital has implemented EHR for over a year	106 (37.1)	113 (39.5)	45 (15.7)	22 (7.7)	3.06	0.91	Agreed
3	Healthcare providers have easy access to EHR systems	93 (32.5)	128 (44.8)	47 (16.4)	18 (6.3)	3.03	0.86	Agreed
4	All departments in the hospital currently use HER	64 (22.4)	96 (33.6)	88 (30.8)	38 (13.3)	2.65	0.97	Agreed
	Availability grand mean (items 1–4)					2.99		Agreed
5	Technical issues such as downtime or slow loading occur frequently	110 (38.5)	105 (36.7)	51 (17.8)	20 (7.0)	3.07	0.92	Agreed

Criterion mean = 2.50. Item 5 is negatively worded and is reported separately from the availability grand mean.

Table 3 shows that EHR were available in respondents' departments (M = 3.23; 85.7% agreement), had been in use for over a year (M = 3.06) and were easily accessible to providers (M = 3.03). The availability grand mean was 2.99. However, hospital-wide use received the lowest rating (M = 2.65), with 44.1% of respondents disagreeing that all departments use EHR. Three-quarters of respondents (75.2%) reported frequent technical issues such as downtime and slow loading (M = 3.07).

Effect of EHR on Patient Waiting Time

Table 4: Effect of Electronic Health Records on Patient Waiting Time (N = 286)

S/N	Statement	SA n (%)	A n (%)	D n (%)	SD n (%)	Mean	SD	Rank
1	EHR have made accessing medical histories faster, reducing waiting time	132 (46.2)	116 (40.6)	29 (10.1)	9 (3.1)	3.30	0.78	1st
2	EHR have improved patient registration and reduced waiting times	121 (42.3)	119 (41.6)	32 (11.2)	14 (4.9)	3.21	0.83	2nd
3	EHR implementation has reduced patient waiting time in my department	103 (36.0)	129 (45.1)	42 (14.7)	12 (4.2)	3.13	0.81	3rd
4	Average waiting time has decreased significantly since EHR implementation	88 (30.8)	126 (44.1)	54 (18.9)	18 (6.3)	2.99	0.87	4th

Continuation of Table 4

5	EHR have improved appointment scheduling, reducing waiting times	83 (29.0)	115 (40.2)	61 (21.3)	27 (9.4)	2.89	0.93	5th
6	Patients have noticed a significant reduction in waiting time due to HER	72 (25.2)	118 (41.3)	70 (24.5)	26 (9.1)	2.83	0.91	6th
	Grand mean					3.06		Agreed

Criterion mean = 2.50.

All six items exceeded the criterion mean, giving a grand mean of 3.06. The strongest effects were faster access to medical histories (M = 3.30; 86.7% agreement) and improved registration (M = 3.21; 83.9%). Most respondents (81.1%) agreed that EHR had reduced waiting time in their own department. Agreement was lower for improved appointment scheduling (69.2%) and for patients noticing a reduction in waiting time (66.4%).

Test of Hypothesis

Table 5: Chi-square Test of Daily EHR Use and Perceived Reduction in Patient Waiting Time

Daily EHR use	Agreed waiting time reduced	Disagreed	Total	% Agreed
Yes	196	30	226	86.7
No	36	24	60	60.0
Total	232	54	286	81.1

$\chi^2 = 22.11$, df = 1, $p < 0.001$ (Yates-corrected $\chi^2 = 20.40$, $p < 0.001$); OR = 4.36 (95% CI 2.29–8.29); $\varphi = 0.28$. Decision: H_{01} rejected.

Daily EHR users were far more likely to report reduced waiting time (86.7%) than non-daily users (60.0%). The association was statistically significant ($\chi^2 = 22.11$, df = 1, $p < 0.001$) and remained significant after Yates' continuity correction. Daily users had 4.4 times the odds of reporting reduced waiting time compared with non-daily users (95% CI 2.29–8.29). The phi coefficient of 0.28 indicates a small-to-medium association. H_{01} was therefore rejected.

DISCUSSION

Availability of EHR

EHR were available and accessible to most professionals at UITH, and nearly four in five respondents used the system daily. This indicates that the hospital has moved beyond the pilot stage typical of many sub-Saharan African implementations (Williams & Boren, 2008). However, the lowest-rated availability item concerned use across all departments, with over two-fifths of respondents disagreeing that every department was on the system. This pattern of partial, department-by-department deployment is widely reported in low-resource settings (Ohuabunwa et al., 2016; Fritz et al., 2015).

Partial deployment matters for waiting time. A patient's visit typically crosses registration, consultation, the laboratory, radiology and the pharmacy. If one link in this chain remains paper-based, information must still be transcribed or carried physically, and the delay of the slowest link governs the patient's total waiting time. The finding that three-quarters of respondents experienced frequent downtime or slow loading further suggests that availability is not the same as dependable availability. In DeLone and McLean's (2003) terms, system quality remains a constraint on the net benefits the hospital can obtain.

Effect of EHR on Waiting Time

Respondents agreed that EHR had reduced patient waiting time, and the pattern of item ratings shows where the gains come from. The two highest-rated items, faster access to medical histories and improved registration, both concern the records function at the start of the patient journey. This is precisely where Nigerian studies have located the largest delays

in paper-based hospitals (Oche & Adamu, 2013; Ofili & Ofovwe, 2005). The finding supports the view that EHR reduce waiting time mainly by eliminating folder retrieval and repeated data entry (Buntin et al., 2011; Menachemi & Collum, 2011).

Gains were weaker for appointment scheduling. This is consistent with Jabour (2020), who found that time savings appeared only after dedicated booking tools were added to the EHR. It suggests that UITH's scheduling functions may be underused or not fully deployed. Without effective scheduling, patients may still arrive together early in the morning, creating queues that registration speed alone cannot remove.

The lowest-rated item was whether patients had noticed a reduction in waiting time. Two explanations are plausible. First, staff may perceive time savings in their own tasks that are not visible in the patient's total time in the hospital, which also depends on consultation length, the number of doctors on duty and queues at other service points. Second, increased documentation time during consultations, reported in several studies (Poissant et al., 2005; Sinsky et al., 2016), may offset some of the gains made at registration. This finding cautions against assuming that faster records automatically mean shorter total waits, and points to the need for objective time measurement.

Daily EHR Use and Waiting Time

The significant association between daily EHR use and perceived reduction in waiting time supports the use–benefit pathway of the DeLone and McLean (2003) model. Professionals who use the system routinely are more familiar with it, navigate it faster and are better placed to exploit its time-saving features. Occasional users may experience the system as an additional burden, especially when they must switch between paper and electronic records. The finding agrees with the Technology Acceptance Model (Davis, 1989), which links frequent use to perceived usefulness. Because the design is cross-sectional, the direction of the relationship cannot be established: professionals who already perceive time savings may also be more willing to use the system daily.

Role of Health Information Management Professionals

Health Information Management (HIM) professionals occupy a central position in the relationship between EHR and waiting time. In Nigerian teaching hospitals, the records department is traditionally the first service point patients encounter, responsible for registration, folder retrieval and appointment booking. The finding that the largest time savings occur at registration and records retrieval means that the HIM department is where EHR deliver their most visible benefits. It also means that HIM professionals carry particular responsibility for sustaining these gains.

Three roles are especially relevant. First, HIM staff maintain the master patient index; duplicate or incorrect registrations slow retrieval and can split one patient's history across several records. Second, HIM professionals are well placed to manage appointment scheduling, which this study identified as an under-performing function. Using the EHR scheduling module to allocate time slots, monitor clinic capacity and remind patients could spread arrivals across the day and reduce congestion. Third, HIM staff can use EHR timestamps to measure waiting time at each service point. Routine reports on registration-to-consultation time would give management objective evidence of the system's effect and help identify bottlenecks. Strengthening these roles through training and clear responsibilities would help UITH convert perceived time savings into measurable improvements in patient experience.

Implications for Practice

The findings suggest three practical priorities for UITH and similar hospitals. First, extending EHR to all departments, particularly those that form part of the outpatient pathway, would remove the paper links that still slow patient flow. Second, strengthening and actively using appointment scheduling modules could spread patient arrivals and reduce morning congestion. Third, improving infrastructure reliability would ensure that the time savings of EHR are not lost during downtime.

LIMITATIONS

The study measured healthcare professionals' perceptions rather than objectively recorded waiting times, and did not include patients' own reports. Perceived reductions may differ from actual time savings. The cross-sectional design does not permit causal inference, and the use of available respondents within each professional group may limit generalisability. The study was conducted in a single tertiary hospital. Future studies should use time-and-motion methods or EHR timestamp data to measure waiting time before and after implementation, and should include patients' perspectives.

CONCLUSION AND RECOMMENDATIONS

EHR are widely available and used daily by most healthcare professionals at UITH, and their use is significantly associated with reduced patient waiting time. The benefits come mainly from faster access to medical histories and faster registration. Deployment is not yet hospital-wide, scheduling functions contribute less than expected, frequent technical problems persist, and patients may not yet experience the full reduction in waiting time that staff perceive.

The study recommends that:

1. UITH management should extend EHR to all departments, prioritising service points on the outpatient pathway such as the laboratory, radiology and pharmacy.
2. The appointment scheduling module should be fully deployed and used to stagger patient arrivals, with reminders where possible.
3. The hospital should provide reliable power backup and network connectivity to reduce downtime and slow loading.
4. Routine monitoring of waiting time, using EHR timestamps, should be introduced to measure the system's effect objectively.
5. Professionals who do not yet use EHR daily should receive targeted training and support to encourage routine use.

REFERENCES

Ahmad, B. A., Khairatul, K., & Farnaza, A. (2017). An assessment of patient waiting and consultation time in a primary healthcare clinic. *Malaysian Family Physician, 12*(1), 14–21.

Akanbi, M. O., Ocheke, A. N., Agaba, P. A., Daniyam, C. A., Agaba, E. I., Okeke, E. N., & Ukoli, C. O. (2012). Use of electronic health records in sub-Saharan Africa: Progress and challenges. *Journal of Medicine in the Tropics, 14*(1), 1–6.

Ameh, N., Sabo, B., & Oyefabi, M. O. (2013). Application of queuing theory to patient satisfaction at a tertiary hospital in Nigeria. *Nigerian Medical Journal, 54*(1), 64–67.

Buntin, M. B., Burke, M. F., Hoaglin, M. C., & Blumenthal, D. (2011). The benefits of health information technology: A review of the recent literature shows predominantly positive results. *Health Affairs, 30*(3), 464–471.

Chaudhry, B., Wang, J., Wu, S., Maglione, M., Mojica, W., Roth, E., Morton, S. C., & Shekelle, P. G. (2006). Systematic review: Impact of health information technology on quality, efficiency, and costs of medical care. *Annals of Internal Medicine, 144*(10), 742–752.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems, 19*(4), 9–30.

Federal Ministry of Health. (2016). *National health ICT strategic framework 2015–2020*. Federal Ministry of Health, Nigeria.

Fritz, F., Tilahun, B., & Dugas, M. (2015). Success criteria for electronic medical record implementations in low-resource settings: A systematic review. *Journal of the American Medical Informatics Association, 22*(2), 479–488.

Institute of Medicine. (2001). *Crossing the quality chasm: A new health system for the 21st century*. National Academies Press.

Jabour, A. M. (2020). The impact of electronic health records on the duration of patients' visits: Time and motion study. *JMIR Medical Informatics, 8*(2), e16502.

Menachemi, N., & Collum, T. H. (2011). Benefits and drawbacks of electronic health record systems. *Risk Management and Healthcare Policy, 4*, 47–55.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.

Oche, M., & Adamu, H. (2013). Determinants of patient waiting time in the general outpatient department of a tertiary health institution in north western Nigeria. *Annals of Medical and Health Sciences Research, 3*(4), 588–592.

Odekunle, F. F., Odekunle, R. O., & Shankar, S. (2017). Why sub-Saharan Africa lags in electronic health record adoption and possible strategies to increase its adoption in this region. *International Journal of Health Sciences, 11*(4), 59–64.

Ofili, A. N., & Ofovwe, C. E. (2005). Patients' assessment of efficiency of services at a teaching hospital in a developing country. *Annals of African Medicine, 4*(4), 150–153.

Ohuabunwa, E. C., Sun, J., Jubanyik, K. J., & Wallis, L. A. (2016). Electronic medical records in low to middle income countries: The case of Africa. *African Journal of Emergency Medicine, 6*(1), 38–43.

Poissant, L., Pereira, J., Tamblyn, R., & Kawasumi, Y. (2005). The impact of electronic health records on time efficiency of physicians and nurses: A systematic review. *Journal of the American Medical Informatics Association, 12*(5), 505–516.

Sinsky, C., Colligan, L., Li, L., Prgomet, M., Reynolds, S., Goeders, L., Westbrook, J., Tutty, M., & Blike, G. (2016). Allocation of physician time in ambulatory practice: A time and motion study in 4 specialties. *Annals of Internal Medicine, 165*(11), 753–760.

Williams, F., & Boren, S. A. (2008). The role of the electronic medical record (EMR) in care delivery development in developing countries: A systematic review. *Informatics in Primary Care, 16*(2), 139–145.

World Health Organization. (2021). *Global strategy on digital health 2020–2025*. World Health Organization.

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.