

## DIGITIZATION OF MEDICAL RECORDS: IMPLEMENTATION AND IMPACT ON HEALTHCARE DELIVERY IN FEDERAL TEACHING HOSPITAL GOMBE

By

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### Abstract

**Purpose:** This study investigated the digitization of medical records with particular reference to its implementation and impact on healthcare delivery in Federal Teaching Hospital, Gombe. The study adopted the Unified Theory of Acceptance and Utilization of Technology.

**Design/Method/Approach:** The researcher employed a cross-sectional survey method to collect data by using a checklist and questionnaire. The simple random sampling technique was employed to select the sample. The sample size was determined using Taro Yamane's formula, yielding a sample size of three hundred and six (306).

**Findings:** The findings from the study revealed that the Federal Teaching Hospital Gombe uses a variety of electronic medical record (EMR) facilities such as document scanners, cloud storage, Swift practice EMR for the digitization of medical records. The findings also showed that the staff of Federal Teaching Hospital, Gombe, are confident, comfortable, and knowledgeable in using EMR equipment, and also revealed that digitization of medical records has a great impact on healthcare delivery in the institution under study. Institutional factors such as poorly designed interfaces, lack of technical expertise, and erratic power supply are factors militating against the implementation of digital electronic records. Therefore, the research recommended, among others, that Federal Teaching Hospital Gombe should focus on fully integrating all aspects of its EMR system, and the management should schedule training programs to enhance staff proficiency, particularly in advanced EMR tools and software.

**Originality/Value:** Electronic Medical Record adoption at Federal Teaching Hospital Gombe has significantly improved healthcare delivery by enhancing information exchange and patient-centered care

**Implication:** Electronic Medical Record adoption has streamlined record-keeping, improved clinical workflows, facilitated prescriptions, and enhanced collaborative care, reducing hospital remissions and increasing patient satisfaction. Despite these benefits, challenges such as poor interface design, high costs, lack of interconnectivity, and medical staff resistance were identified.

**Keywords:** Digitization, Medical Records, Implementation, Impact, Healthcare Delivery

### Background to the Study

Digital Medical Records (DMR) are electronic versions of traditional paper-

based records designed to enhance patient health and streamline healthcare services. Electronic Medical Records (EMRs)

facilitate the seamless exchange of patient information among healthcare providers, leading to improved coordination and patient-centered care. EMRs store a wide range of health-related data, including medical history, vital signs, medications, immunization status, laboratory results, radiology images, and billing details (Taksler et al., 2021).

Historically, paper-based medical records posed challenges such as storage limitations, retrieval inefficiencies, and risks of misplacement or errors. The transition to digital health records, encouraged by the World Health Organization (WHO), aims to improve healthcare quality, reduce medical errors, and enhance public health initiatives (Tanwar, Parekh, & Evans, 2020; Hohman, 2023). Countries, including Nigeria, have adopted EMR systems like SmartCare to digitize health records and promote universal health coverage.

EMRs contribute to cost reduction, improved data quality, and enhanced operational efficiency in healthcare. The Federal Teaching Hospital (FTH) Gombe is in the process of fully implementing EMRs to improve healthcare delivery. However, challenges such as inadequate funding, interoperability issues, data privacy concerns, and system usability need to be

addressed. Examining EMRs' impact will help optimize their use and further strengthen healthcare systems in Gombe State and Nigeria.

### **Statement of Problem**

The management of health records in most Nigerian health institutions remains predominantly paper-based, leading to inefficiencies, delays in patient care, and communication challenges. Despite the benefits of Electronic Medical Records (EMR) systems, their implementation in low- and middle-income countries like Nigeria faces obstacles such as inadequate infrastructure, lack of management commitment, poor interoperability, and limited support. At the Federal Teaching Hospital (FTH) Gombe, challenges may include high procurement and maintenance costs, insufficient financial incentives, unreliable electricity and Internet, and limited digital literacy among medical staff. This study seeks to identify these barriers and evaluate the impact of digitization on healthcare delivery for effective implementation.

### **Research Objectives**

- i. To ascertain the facilities used for the digitization of medical records in Federal Teaching Hospital, Gombe.
  - ii. To determine the digital literacy of medical staff of Federal Teaching Hospital, Gombe.
  - iii. To assess the level of digitization of medical records in Federal Teaching Hospital, Gombe
  - iv. To determine the impact of digitization of medical records on healthcare delivery in Federal Teaching Hospital, Gombe.
  - v. To determine the institutional factors militating against the implementation of digital electronic record in Federal Teaching Hospital, Gombe.
- v. What are the institutional factors militating against the implementation of digital electronic record on Federal Teaching Hospital, Gombe?

### **Research Hypothesis**

Ho<sub>1</sub>: The digital literacy of medical staff of Federal Teaching Hospital Gombe has no significant effect on the implementation of digital electronic records in Federal Teaching Hospital, Gombe.

Ho<sub>2</sub>: There is no significant relationship between digitization of medical records and healthcare delivery in Federal Teaching Hospital, Gombe

Ho<sub>3</sub>: There is no significant effect of institutional factors on the implementation of digital electronic record of Federal Teaching Hospital, Gombe.

### **Research Questions**

- i. What are the facilities used for the digitization of Medical Records in Federal Teaching Hospital, Gombe?
- ii. What is the digital literacy of medical staff of Federal Teaching Hospital Gombe?
- iii. What is the level of digitization of medical records in Federal Teaching Hospital, Gombe?
- iv. What are the impact of digitization of medical records on healthcare delivery in Federal Teaching Hospital, Gombe?

### **Scope and Limitations of the Study**

This study focuses on the digitization of medical records in Federal Teaching Hospital, Gombe, which encompasses its impact on health delivery, aiming to provide a thorough understanding of its effects. Medical professionals in Federal Teaching Hospital, Gombe were selected for this study because they will offer valuable insights into their experiences and perceptions. However, the study acknowledges potential limitations, including resource constraints,

technical challenges, resistance to change, and the need to ensure data accuracy.

### Literature Review

The transition from paper-based records to Electronic Medical Records (EMRs) began in the 1960s and has since evolved into comprehensive digital systems that manage patient data and billing (Adedeji, Fraser, & Scott, 2022; Adebayo & Akinyoso, 2021). EMRs function as digital repositories within healthcare facilities, integrating applications such as clinical decision support systems to enhance healthcare delivery (Adler-Milstein et al., 2020; Argenziano et al., 2020; Koopman et al., 2021). Various EMR systems, including Cerner EMR and Epic Care EMR, facilitate efficient data access and patient management (Delaney et al., 2022).

The digitization process employs equipment like document scanners and Optical Character Recognition (OCR) software, improving data management but posing challenges related to cost and maintenance (Ahmed et al., 2019; Brown & Miller, 2021). Users of EMRs primarily include medical staff, administrative personnel, and patients, with medical records officers, nurses, and physicians as the main users (Delaney et al., 2022). Additionally, cloud storage solutions offer centralized access to

medical records but introduce concerns over data security and financial implications (Wang et al., 2020; Hernandez et al., 2021).

Digital literacy is critical for healthcare workers, encompassing skills in ICT, telehealth applications, and health diagnostics (O'Connor & LaRue, 2021; Brown et al., 2020). Despite advancements, gaps in digital competencies persist, particularly in using AI and robotics in healthcare (Tegegne et al., 2023). While case studies demonstrating the effectiveness of EMR adoption in improving patient care are highlighted, for example, General Hospital Ikorodu experienced enhanced efficiency through EMRs (Burzyńska, Bartosiewicz, & Januszewicz, 2023), while Kogi State Specialist Hospital improved real-time access to patient data (Igbo et al., 2020). In England, full digitalization of patient records has facilitated seamless access to healthcare information (Thorlby, 2020). EMRs significantly enhance healthcare delivery by improving quality, reducing administrative burdens, and fostering collaboration (Kumar & Mostafa, 2020; Melton et al., 2021). Clinical Decision Support Systems contribute to better patient safety and medication management (Gill et al., 2020). However, challenges such as software deficiencies, costs, and inadequate

training remain obstacles to effective EMR implementation (Afolabi et al., 2022; Hernandez, Garcia & Lopez, et al., 2021). Ensuring user-friendly interfaces and comprehensive training is vital for successful EMR integration.

### **Theoretical Framework**

This study utilizes the Unified Theory of Acceptance and Utilization of Technology (UTAUT), which suggests that the actual use of technology is driven by behavioral intention. The Unified Theory of Acceptance and Utilization of Technology (UTAUT) explains how people adopt technology based on behavioral intention, which is influenced by four key factors: performance expectancy (belief that technology improves performance), effort expectancy (ease of use), social influence (impact of others' opinions), and facilitating conditions (availability of support) (Venkatesh et al., 2003). These factors are further influenced by age, gender, experience, and voluntariness of use, which affect how strongly they impact behavioral

intention. UTAUT integrates elements from previous models like the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) and explains 70% of technology adoption variance, making it more effective than earlier models (Venkatesh, Thong & Xu, 2016).

### **Methodology**

This study employs a cross-sectional survey method to examine the impact of medical record digitization on healthcare delivery at Federal Teaching Hospital, Gombe. This approach was chosen for its efficiency, cost-effectiveness, and ability to provide generalizable insights (Jilcha, 2020). The study targets 1,243 medical workers across various cadres at the hospital. A simple random sampling technique was used to select participants, while convenient/judgmental sampling was also applied to ensure the inclusion of relevant respondents (Nurhafizah et al., 2023). The Taro Yamane formula determined a final

sample size of 306. Data collection involved checklists and structured questionnaires, with responses analyzed using SPSS.

Descriptive and inferential statistics, including frequency and percentage tables, were used to present findings clearly.

**Data Analysis and Interpretation**

**Table 1: Facilities in use for the Digitization of Medical Records (tick if available or unavailable)**

S/N	Equipment/Facilities	Available	Unavailable
1.	Document Scanners	✓	0
2.	Nextech EMR	0	✓
3.	Microfilm Scanners	✓	
4.	Optical Character Recognition (OCR)	✓	
5.	Film Digitizers	0	✓
6.	Swiftpractice EMR	✓	
7.	Robotic Scanners	✓	
8.	Cloud Storage	✓	
9.	Digital Imaging and Communication in Medicine (DIGCOM) System	✓	
10.	Epic Care EMR		✓

**Source:** Report as observed from the checklist

The table above presents the report as observed from the checklist by respondents on the facilities used for the digitization of medical records in FTH Gombe. All the respondents (100%) affirmed that Electronic Medical Record (EMR), such as document scanners, microfilm scanners, optical character recognition (OCR), Swiftpractice EMR, robotic scanners, cloud storage,

DIGCOM in medicine systems, are all available, and they affirmed that Nextech EMR, film digitizers, and Epic care EMR are not available in the institutions. This indicates that the institution under study uses a variety of EMR equipment and facilities for the digitization of medical records.

**Table 2: Digital Literacy of Medical Staff of Federal Teaching Hospital Gombe.**

Confidence in Using EMR Equipment					
S/N	Statement	Very highly confident	Very Confident	Confident	Not Confident at all
1.	How confident are you in setting up and using	200	55	20	10

	high-resolution scanners for detailed document scanning in digitizing medical records?	(70.2%)	(19.3%)	(7.0%)	(3.5%)
2.	How confident are you in using microfilm scanners to digitize archived medical records?	150 (52.6%)	120 (42.1%)	10 (3.5%)	5 (1.8%)
3.	How confident are you in using handheld scanners for capturing medical records?	120 (42.1%)	140 (49.1%)	15 (5.3%)	10 (3.5%)
<b>Proficiency in Operating EMR Software and Systems</b>					
	Statement	Very proficient	Proficient	Not proficient	Not proficient at all
4.	How proficient are you in operating Optical Character Recognition (OCR) software for converting scanned medical records into editable text?	100 (35.1%)	105 (36.8%)	60 (21.1%)	20 (7.0%)
5.	How proficient are you in maintaining and troubleshooting on-premises storage systems for medical records?	120 (42.1%)	125 (43.9%)	30 (10.5%)	10 (3.5%)
6.	How proficient are you in configuring and managing electronic file formats (e.g., PDF, TIFF) for medical record storage?	125 (43.9%)	105 (36.8%)	40 (14.0%)	15 (5.3%)
<b>Comfort in Using EMR Systems</b>					
	Statement	Very Comfortable	Comfortable	Uncomfortable	Very Uncomfortable
7.	How comfortable are you with using Electronic Health Record (EMR) systems for managing digitized medical records?	120 (42.1%)	125 (43.9%)	25 (8.8%)	15 (5.3%)
8.	How comfortable are you with implementing and using Digital Imaging and Communications in Medicine (DICOM) standards for handling medical imaging information?	125 (43.9%)	120 (42.1%)	30 (10.5%)	10 (3.5%)
9.	How comfortable are you with accessing and retrieving digitized medical records using hospital information systems?	135 (47.4%)	110 (38.6%)	30 (12.3%)	5 (1.8%)
10	How comfortable are you with the security protocols in place for managing digitized medical records?	105 (36.8%)	115 (40.4%)	55 (19.3%)	10 (3.5%)
<b>Knowledge of EMR Systems and Standards</b>					
	Statement	Very Knowledgeable	Knowledgeable	undecided	Not Knowledgeable at All
11	How knowledgeable are you about storing and managing digitized medical records using cloud	115 (40.4%)	125 (43.9%)	30 (10.5%)	15 (5.3%)

	storage solutions?				
12	How knowledgeable are you about integrating DICOM standards with Electronic Health Record (EMR) systems?	130 (45.6%)	105 (36.8%)	35 (12.3%)	10 (5.3%)
13	How knowledgeable are you about data encryption methods used for securing digitized medical records?	100 (35.1%)	105 (36.8%)	60 (21.1%)	20 (7.0%)
14	How knowledgeable are you about compliance with legal and regulatory requirements for digital medical record management?	155 (54.4%)	124 (43.5%)	6 (2.1%)	0 (0.0%)

The study on the digital literacy of medical staff at the Federal Teaching Hospital, Gombe, reveals a generally high level of confidence, proficiency, comfort, and knowledge in using Electronic Medical Records (EMR) systems and related technologies. A significant percentage of respondents demonstrated strong confidence in using EMR equipment, particularly high-resolution scanners (70.2%), microfilm scanners (52.6%), and handheld scanners (42.1%). Similarly, proficiency in operating EMR software was notable, with 42.1% being very proficient in maintaining on-premises storage systems and 43.9% in managing electronic file formats like PDF and TIFF. Regarding comfort in using EMR systems, 42.1% felt very comfortable with Electronic Health Record (EHR) systems, 43.9% with DICOM standards, and 47.4% with hospital information systems. Additionally, knowledge of EMR systems and standards was high, particularly in compliance with regulatory requirements (54.4%) and integrating DICOM standards (45.6%). However, some areas, such as proficiency in Optical Character Recognition (OCR) software, comfort with security protocols, and understanding data encryption methods, show room for improvement. Overall, while digital literacy levels among medical staff are commendable, targeted training in these areas could further enhance efficiency and security in managing digitized medical records.

**Table 3: Level of Digitization of Medical Records of the EMR Equipment and Facilities available in your institutions**

S/N	Statement	Fully	Partially	Not Digitized
1.	Patients in the hospital are completely registered on a central computer server	130 (45.6%)	155 (54.4%)	0 (0.0%)
2.	Tests are fully ordered by patients online, and results are returned via the same channel	120 (42.1%)	160 (56.1%)	5 (1.8%)
3.	The EMR system in the hospital has a complete and comprehensive billing system	270 (94.7%)	15 (5.3%)	0 (0.0%)
4.	Consultations are accessed by all sectors of the	110	100	75

	hospital using real-time systems.	(38.6%)	(35.1%)	(26.3%)
5.	All the patient records are computerized, and prescriptions and booking of appointments are completely done online.	65 (22.8%)	180 (63.2%)	40 (14.0%)
6.	Patients access the records of themselves, such as diagnosis, medication, treatment, and immunizations, test and scan results on the hospital's online platform.	210 (73.7%)	25 (8.8%)	50 (17.5%)
7.	The EMR software of Federal Teaching Hospital Gombe can keep track of patient demographics, medication orders, laboratory test results, and clinical notes.	210 (73.7%)	75 (26.3%)	0 (0.0%)
8.	The EMR systems in the hospital have complete checking functions, such as alerts or reminders on contraindications of drug-to-drug and drug-to-age interactions.	70 (24.6%)	100 (35.1%)	115 (40.4%)
9.	Patients can see their health data from computers and mobile devices with clinical-decision-supporting functionalities.	65 (22.8%)	175 (61.5%)	45 (15.8%)

**Source:** Fieldwork, 2024

The respondents' feedback on the digitization of medical records and the availability of EMR equipment and facilities highlights both strengths and areas for improvement. While patient registration is partially computerized for 54.4% of respondents, 45.6% confirm full registration on a central server. Similarly, 56.1% report that test ordering and result retrieval are only partially online, whereas 42.1% indicate full implementation. The EMR system is most effective in billing, with 94.7% acknowledging comprehensive functionality. However, real-time access to consultations across hospital sectors remains inconsistent, with only 38.6% confirming full access. Record management also faces challenges, as only 38.6% report full digitization of patient records, prescriptions, and

appointment bookings, while 63.2% experience partial implementation. On the positive side, 73.7% confirm online patient access to medical records and effective tracking of demographics, medication orders, and clinical notes. However, decision-support functions, such as drug contraindication alerts, remain underutilized, with only 24.6% confirming full implementation. Additionally, patient access to health data via computers or mobile devices is still limited, with just 22.8% reporting full accessibility. Overall, while the EMR system excels in billing and record access, critical areas like real-time consultation sharing, prescription management, and decision-support functionalities require significant improvement.

**Table 4: Impact of Digitization of Medical Records**

S/N	Statement	SA	A	D	SD
1.	EMRs have reduced the cumbersome manual record-keeping method and allow healthcare providers to allocate more time to patient care, devoid of errors.	205 (71.9%)	80 (28.1%)	0 (0.0%)	0 (0.0%)
2.	EMRs have enhanced clinical workflows and enabled a quicker and improved decision support system that offers recommendations based on the latest clinical guidelines and research.	250 (87.7%)	35 (12.3%)	0 (0.0%)	0 (0.0%)
3.	EMRs have facilitated the prescription process and maintained comprehensive medication lists.	215 (75.4%)	70 (24.6%)	0 (0.0%)	0 (0.0%)
4.	EMRs have enabled real-time sharing of patient information across different healthcare settings.	260 (91.2%)	25 (8.8%)	0 (0.0%)	0 (0.0%)
5.	EMRs have supported the development of care teams by allowing healthcare providers to communicate and collaborate on patient care plans easily.	200 (70.2%)	85 (29.8%)	0 (0.0%)	0 (0.0%)
6.	EMRs have fostered a more collaborative relationship between patients and medical providers, which has increased patients' satisfaction.	240 (84.2%)	45 (15.8%)	0 (0.0%)	0 (0.0%)
7.	EMRs have improved patient monitoring and follow-up, allowing healthcare providers to respond promptly to any changes in a patient's condition.	220 (77.2%)	65 (22.8%)	0 (0.0%)	0 (0.0%)
8.	EMRs have reduced hospital readmission rates by enabling better discharge planning and coordination of care post-discharge.	235 (82.5%)	50 (17.5%)	0 (0.0%)	0 (0.0%)

**Source:** Fieldwork, 2024

The findings underscore the numerous benefits of digitizing medical records through Electronic Medical Records (EMRs). A significant majority (71.9%) agreed that EMRs reduce manual record-keeping burdens, enhancing efficiency and minimizing errors. Additionally, 87.7% acknowledged improvements in clinical workflows, enabling faster and more informed decision-making. EMRs were also credited with streamlining prescription processes (75.4%) and facilitating

real-time patient information sharing (91.2%). Furthermore, 70.2% believed EMRs support collaborative care, while 84.2% noted improvements in patient-provider relationships. Enhanced patient monitoring (77.2%) and reduced hospital readmissions (82.5%) due to better discharge planning and follow-up care further highlight the impact of EMRs on healthcare efficiency and patient outcomes.

**Table 5: Institutional Factors Militating against Implementation of Digital Electronic Records**

S/N	Statement	SA	A	D	SD
1.	Poorly designed EMR interfaces, high costs associated with EMRs implementation, and hospitals' limited budgets.	285 (100%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
2.	Lack of an effective system, lack of necessary hardware and software interconnectivity, and start-up cost.	260 (91.2%)	25 (8.8%)	0 (0.0%)	0 (0.0%)
3.	Reluctance of medical professionals to change and accept EMR technology and not spend more time to get acquainted with the system.	195 (68.4%)	85 (29.8%)	5 (1.8%)	0 (0.0%)
4.	Lack of technical expertise and lack of adequate support for effective system utilization	255 (89.5%)	30 (10.5%)	0 (0.0%)	0 (0.0%)
5.	Inadequate institutional patient data privacy and security.	230 (80.7%)	55 (19.3%)	0 (0.0%)	0 (0.0%)
6.	Absence of a legal framework such as the Health Insurance Portability and Accountability Act (HIPAA) and the General Data Protection Regulation (GDPR).	255 (89.5%)	30 (10.5%)	0 (0.0%)	0 (0.0%)
7.	Inadequate electricity and erratic power supply.	285 (100%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

**Source:** Fieldwork, 2024

The table highlights key institutional barriers to Electronic Medical Records (EMRs) implementation. All respondents (100%) agreed that poorly designed interfaces, high implementation costs, and inadequate electricity hinder adoption. Additionally, 91.2% cited hardware/software interconnectivity issues and high startup costs. A lack of technical expertise (89.5%) and legal frameworks (89.5%) were also significant concerns. Patient data privacy and security issues were noted by 80.7%, while 68.4% pointed to reluctance among medical professionals to adopt EMRs.

## Research Hypothesis Testing

### Hypothesis 1

**H<sub>0</sub>:** The digital literacy of medical staff of Federal Teaching Hospital Gombe has no significant effect on implementation of digital electronic record in Federal Teaching Hospital Gombe.

**H<sub>A</sub>:** The digital literacy of medical staff of Federal Teaching Hospital Gombe has a significant effect on implementation of digital electronic record in Federal Teaching Hospital Gombe.

**Test 1: One-Sample T-Test on the Significant Effect of Digital Literacy of Medical Staff of Federal Teaching Hospital Gombe on Implementation of Digital Electronic Record in Federal Teaching Hospital Gombe.**

Comparison of the Levels of Digital Literacy of Medical Staff in Federal Teaching Hospital Gombe	T	Df	Mean Diff.	Sig. Value	95% Confidence Interval	
					Lower	Upper
Digital Literacy Level of Medical Staff in Federal Teaching Hospital Gombe	39.293	284	24.40	0.000	2.10	2.61

**Source:** Fieldwork, 2024

From the above table, the One-Sample T-test result is less than the significance level (0.05). The P-value from the One-Sample T-Test (0.000) is less than the significance level (0.05). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. This shows that the digital literacy of the medical staff of Federal Teaching Hospital, Gombe has a significant effect on the implementation of the digital electronic

records in Federal Teaching Hospital, Gombe.

**Hypothesis 2**

**H<sub>0</sub>:** There is no significant relationship between digitization of medical records and healthcare delivery in Federal Teaching Hospital Gombe

**H<sub>A</sub>:** There is a significant relationship between digitization of medical records and healthcare delivery in Federal Teaching Hospital Gombe

**Test 2: One-Sample T-Test on the Significant Relationship between Digitization of Medical Records and Healthcare Delivery in Federal Teaching Hospital Gombe.**

Comparison of the Levels of Digitization of Medical Records in Federal Teaching Hospital Gombe	T	Df	Mean Diff.	Sig. Value	95% Confidence Interval	
					Lower	Upper
Level of Digitization of Medical Records in Federal Teaching Hospital Gombe	59.94	284	14.50	0.000	14.02	14.97

**Source:** Fieldwork, 2024

The above table displays the One-Sample T-Test result, which is less than the significance level (0.05). The P-value from the One-Sample T-Test (0.000) is less than

the significance level (0.05). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. This shows that there is a significant relationship

between digitization of medical records and healthcare delivery in Federal Teaching Hospital, Gombe.

**Hypothesis 3**

**H<sub>0</sub>:** There is no significant effect of institutional factors on the implementation

of digital electronic record of Federal Teaching Hospital Gombe.

**H<sub>A</sub>:** There is a significant effect of institutional factors on the implementation of digital electronic record of Federal Teaching Hospital, Gombe.

**Test 3: One-Sample T-Test on the Significant Effect of Institutional Factors on Implementation of Digital Electronic Record of Federal Teaching Hospital Gombe.**

Comparison between the Institutional Factors Affecting the Implementation of EMR	T	Df	Mean Diff.	Sig. Value	95% Confidence Interval	
					Lower	Upper
Institutional Factors Affecting the Implementation of EMR at FHT Gombe	84.20	284	7.83	0.000	7.64	8.00

**Source:** Fieldwork, 2024

The above table shows the One-Sample T-Test result, which is less than the significance level (0.05). The P-value from the One-Sample T-Test (0.000) is less than the significance level (0.05). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. This shows that there is a significant effect of institutional factors on the implementation of digital electronic record of Federal Teaching Hospital, Gombe.

**Discussion of Findings**

The study found that Federal Teaching Hospital (FTH) Gombe has implemented various Electronic Medical Record (EMR) equipment, including document scanners, microfilm scanners, Optical Character Recognition (OCR), and cloud storage.

However, Nextech EMR and film digitizers are not available. While patient registration is partially centralized, aligning with PDA (2024), the hospital’s EMR system supports online test ordering, billing, and real-time consultations, enhancing healthcare services, as supported by Igbo et al. (2020). EMRs effectively track patient records, demographics, medication orders, and clinical notes, with features such as drug interaction alerts, corroborating Zaleski (cited in Feras et al., 2021) and findings from Hackensack University Medical Centre (Staff, 2023). Medical staff exhibited confidence in using high-resolution and microfilm scanners but had lower proficiency with handheld scanners. OCR proficiency was moderate, while cloud

storage and data security management skills were strong, supporting Longhini et al. (2022). The study confirmed that EMR adoption has streamlined record-keeping, improved clinical workflows, facilitated prescriptions, and enhanced collaborative care, reducing hospital readmissions and increasing patient satisfaction, in line with Kumar and Mostafa (2020), Morris et al. (2023), Dhruva et al. (2020), Abraham et al. (2022), and Krzensinski (2023). Despite these benefits, challenges such as poor interface design, high costs, lack of interconnectivity, and medical staff resistance were identified, consistent with Afolabi et al. (2022). Concerns over data privacy and technical expertise were also raised, supporting Bani-Issa et al. (2020) and Keshta and Odeh (2021). Additionally, inadequate electricity supply was noted as a major limitation.

### **Conclusion**

The study concludes that EMR adoption at FTH Gombe has significantly improved healthcare delivery by enhancing information exchange and patient-centered care. However, challenges such as system design flaws, financial constraints, and infrastructure limitations persist. Despite these issues, EMRs have positively impacted clinical workflows, patient care, and hospital

efficiency, demonstrating their essential role in modern healthcare.

### **Recommendations**

To enhance EMR implementation at FTH Gombe, the following recommendations are proposed:

- i. The hospital should ensure real-time access to consultations, computerized prescriptions, and comprehensive safety alerts for drug interactions.
- ii. Staff Training programs should be conducted regularly to enhance proficiency in advanced EMR tools and software.
- iii. Stronger data encryption protocols and a clear legal framework should be established for patient data protection.
- iv. The Ministry of Health and FTH Gombe should allocate sufficient funds for EMR implementation and maintenance.
- v. The hospital should collaborate with government bodies to adopt regulations aligned with international data protection standards such as HIPAA or GDPR.

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