

Healthcare Workers Perception and Satisfaction with the Use of Electronic Medical Records in a Tertiary Hospital in Southwest Nigeria

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ABSTRACT

Background: Adequate medical record-keeping and prompt information retrieval for decision-making are essential to effectively and efficiently run healthcare services. This process is being revolutionized with the introduction of Electronic Medical Recording (EMR) in the healthcare industry. **Objectives:** The study aims to assess healthcare workers' perception and satisfaction levels with the use of EMR. **Methods:** The study was a hospital-based cross-sectional study involving health workers as the study population. A total of 316 participants participated in the study. Respondents were selected using a systematic random sampling technique. Data was collected using a validated self-administered questionnaire and analysed using IBM SPSS version 25. **Results:** The mean age of the respondents was 35.7 ± 8.7 years, and the majority 41.1% were aged between 30 and 39 years. Most of the respondents 86.4%, had a positive perception of using EMR. 85.1% agreed that EMR is easy to learn, 81.0% agreed it is easy to use, 92.7% agreed that information in EMR is useful for patient care, and 78.2% agreed it improves ease of work. Respondents recommended that the EMR interphase should be more user-friendly, improving internet access, regular system updates, providing more hardware and periodic training. **Conclusion:** This study reported high satisfaction levels and positive perception of the EMR. EMR made work more efficient and was easy to use. Findings from this study support the adoption of EMR in tertiary health facilities.

Keywords: Computed tomography, Paranasal sinus, Sinonasal disease, Inflammatory, Rhinosinusitis, Polyposis

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Date Submitted 26th March 2024

Date Accepted 20th May 2024

Date Published online 30th June 2024

Introduction

Adequate medical record-keeping and prompt information retrieval for decision-making are essential to effectively and efficiently run healthcare

services. This process is being revolutionized with the introduction of Electronic Medical Recording (EMR) in the healthcare industry. Information technology (IT) improvements have brought about the use of internet-enabled computers and other devices in providing alternative solutions to problems in today's world.¹ This is changing how work is being done globally with its impact felt across several sectors including health, economics, engineering, commerce, communication, and science. The use of IT in the healthcare industry has evolved over the years, gradually changing the face of the industry from the traditional ways of working to the use of artificial intelligence in making diagnoses prognoses, as well as recording and retrieving patients' information using the EMR.^{2,3} Medical records contain a chronologically written account of a patient's complaints, medical history, examination findings, diagnostic tests, and treatment prescribed by physicians.⁴ Safekeeping and prompt retrieval of information are important aspects of patient management. In most developing countries, traditional record-keeping using folders and shelves

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DOI: 10.31173/bomj.bomj_2411_21



remains the major method of keeping patient records; however, this is beginning to change.⁵ The traditional paper-based record keeping comes at a huge cost due to the large numbers of personnel and space required. Aside from being laborious, this method is prone to frequent record losses and contributes majorly to long hospital waiting times.⁴ Other inadequacies of paper-based recording include illegible handwriting, poor data quality, data safety, long-term storage, lack of confidentiality, unauthorized users' access, occupies more space and poor patient follow-up. Addressing these flaws of paper-based recording, most developed countries and a few developing ones have adopted EMR in collecting and managing health information in hospitals.¹ The use of EMR has also significantly reduced the waiting time in hospitals a major determinant of quality of service delivery.⁶

In Nigeria, the paper-based medical recording system has been largely in use across all strata of healthcare. Workers in the industry are quite familiar with its use owing to its long history and because it requires low technical knowledge and skills. This is beginning to change especially in tertiary facilities, which are typical areas for pioneering new interventions in healthcare.

Evidence from previous studies shows that workers' perception and satisfaction relating to the use of EMR varies across health facilities. A cross-sectional study in Saudi Arabia⁷ reported that 52.8% of the workers had positive perceptions of the use of EMR, while in another study in Zaria, Nigeria,⁸ 96.9% of health staff had positive perceptions. In another study in Saudi Arabia, only 40% of the respondents were reported to be satisfied with the use of EMR.⁹ Despite the potential benefits of the introduction of EMR on service delivery, several challenges still limit its use, especially in developing countries. Some of these factors are; unstable power supply, poor/unstable internet connectivity, negative attitude of staff, low computer literacy, the poor orientation of healthcare providers and patients alike, high cost of installation and maintenance of equipment, high cost of training, and poor healthcare funding.¹⁰⁻¹²

In Nigeria today, the use of EMR is still low, with less than 10% of hospitals currently using the method.¹³ Despite the seemingly obvious advantages of EMR, only a few tertiary hospitals have adopted its use,¹

with the majority still relying on paper-based record-keeping.

The Federal Medical Centre Abeokuta introduced the EMR systems in the facility in the year 2021 to make keeping and retrieving records seamless and to make service delivery more effective and efficient. Despite being a laudable milestone, this switch is not without some challenges due to the high inertia of workers to adapt to new work interfaces. In addition, when changes are made to work processes, it is important to continually assess workers' concerns as a way of continuous process improvements.

Therefore, the study aims to assess healthcare workers' perception and satisfaction levels with the use of EMR in Federal Medical Centre Abeokuta. Also, the study will contribute to the available literature on this subject in Nigeria and the Sub-region as currently, there is a dearth of literature on the subject in the region. We hope that findings from the study will help hospital administrators enhance the seamless transition from traditional to electronic medical record-keeping in the facility and beyond.

Methods:

This study was conducted at Federal Medical Centre Abeokuta (FMCA). The facility is a public tertiary health care institution in the capital city of Abeokuta, Ogun State. The facility was established in 1993, and since its inception, it has been using the paper-based medical record system. However, the facility began transitioning from the manual to the electronic medical record system in 2021. As of the beginning of the year 2022, the facility has achieved about 80% completion rate in its transition from paper to electronic-based medical recording across all units and departments of the hospital. The facility has a total of 2216 healthcare workers made up of professionals ranging from Doctors, Nurses, Medical Record Officers, Pharmacists, Physiotherapists, and Laboratory Scientists at the time the study was conducted.

The study was a hospital-based cross-sectional study with health workers in the facility as the study population. Workers who have been using the EMR for at least six months were included in the study, while interns and other temporary staff who have not been in the hospital for 6 months were excluded from participating. The sample size for the study was calculated using Cochran's sample size formula $n = \frac{Z^2 pq}{d^2}$. Using the prevalence of 40% reported for



satisfaction in a previous study in Saudi Arabia as “p”, the formula yielded a sample size of 369. After adjustments for attrition and 5% non-response, a total of 332 participants were finally recruited for the study. Respondents were selected using a systematic sampling technique from the list of trained users of EMR obtained from the IT unit and the questionnaires were then distributed by proportionate allocation.

Data was collected using a validated self-administered questionnaire adopted from previous studies.^{8,9,14} The questionnaire had sections on sociodemographic characteristics and work profile of respondents, respondents’ perception of EMR, and level of satisfaction with EMR use. Responses for perception and satisfaction were rated on the Likert scale with options ranging from “strongly disagree (1),” “disagree (2),” “neutral (3),” “agree (4)” and “strongly agree (5). The responses were collapsed, with responses 4 and 5 becoming “agreed”. The total scores obtainable for respondents’ perception ranged from 17 to 85 and was categorised into negative perception “17 – 51” and positive perception “> 51”. For satisfaction, the total scores obtainable for respondents’ satisfaction with EMR ranged from 9 to 45 and was categorised into low satisfaction “9 – 27” and high satisfaction “> 27”. Six research assistants were recruited from the Department of Community

Medicine and Primary Care and were trained on participant selection.

Data was analysed using IBM SPSS version 25, and summary statistics were presented in tables using frequencies and percentages for categorical variables and means with standard deviation for continuous variables. Recommendations by respondents on ways to improve the EMR system were analysed and presented under six themes in a chart.

Ethical approval with number FMCA/4470HREC/01/2022/07 was obtained from the Research and Ethics Committee of the hospital, and all information obtained was treated confidentially. Informed consent was obtained from all participants after informing them of the study’s purpose and nature.

Results

A total of 316 healthcare workers participated in the study, giving a response rate of 95.2%. The mean age of the respondents was **35.7 ± 8.7 years**, and the majority 130 (41.1%) were aged between 30 and 39 years. Nearly all 315 (99.7%) of the respondents attained tertiary-level education, with nurses 111 (35.1%) and doctors 105 (33.2%) being the majority job categories. The majority of the respondents’ 175 (55.4%) had work experience of greater than five years. Details of the socio demographic characteristics is shown in table I.



Table 1: Socio demographic characteristics

Variables	Frequency (n=316)	Proportion (%)
Age group		
<30	91	28.8
30-39	130	41.1
40-49	65	20.6
≥50	30	9.5
Mean age ± SD (yrs)	35.7 ± 8.7	
Sex		
Male	129	40.8
Female	187	59.2
Religion		
Islam	126	39.9
Christianity	190	60.1
Marital status		
Single	104	32.9
Married	209	66.1
Widowed	3	.9
Educational status		
Secondary	1	.3
Tertiary	315	99.7
Job title		
Nurse	111	35.1
Doctors	105	33.2
Pharmacist	38	12.0
Health Record Officer	34	10.8
Med. Lab Scientist	13	4.1
Radiographers	8	2.5
Physiotherapist	7	2.2
Work duration		
1-5 years	141	44.6
>5 years	175	55.4

Most respondents, 245 (77.5%), own a personal computer, with nearly half, 148 (46.8%), using computers daily outside the facility. Two hundred and twenty-seven (71.8%) respondents had been using the

EMR for at least twelve months, but the majority of them, 216 (68.4%) do not use it elsewhere. Respondents experience in IT is shown in table II.



Table 2: Respondents experience in IT

Variables	Frequency (n=316)	Proportion
Ownership of personal computer		
No	71	22.5
Yes	245	77.5
Use of computer outside the facility		
Not at all	37	11.7
Daily	148	46.8
Weekly	81	25.6
bi-weekly	47	14.9
Monthly	3	.9
Duration of experience on EMR (months)		
≤11	89	28.2
≥12	227	71.8
Ever worked with EMR aside in the facility		
No	216	68.4
Yes	100	31.6
Opinion ever been sought on ways to improve EMR system		
No	209	66.1
Yes	107	33.9

Respondents' Perception of EMR Use

Most of the respondents, 273 (86.4%), had a positive perception of using EMR. Out of the 316 respondents, 85.1% agreed that EMR is easy to learn, 81.0% agreed it is easy to use, 92.7% agreed that information in EMR is useful for patient care, and 78.2% agreed it improves

ease of work. Less than half, 149 (47.2%) of the respondents, agreed that information on the EMR is regularly updated, and another 146 (46.2%) agreed it has all the information they need. Table III shows respondents' perception towards EMR use.

Table 3: Respondents' perception towards EMR use

Variables (n=316)	Frequency	Proportion
Overall perception (using the 17-item)		
Positive	273	86.4
Negative	43	13.6
Agreement with individual item		
It is easy to learn how to use an EMR	269	85.1
The EMR is easy to use	256	81.0
Information registered are important for the care of the patients	293	92.7
The EMR is integrated into the daily work	264	83.5
It is easy to know how to request a test, record, etc on the EMR	197	62.3
The information I access from the EMR makes my work easier	247	78.2
The relationship with the personnel of the department of EMR is good	187	59.2
Suggestions made are taken into account	127	40.2
The attitude of the personnel of the department of EMR is cooperative	204	64.6
The response time to the introduction of an improvement is adequate	149	47.2
The people responsible for developing the EMR understand my problems	131	41.5
The changes introduced is important to my daily work	221	69.9
I have access to the information where I need it	211	66.8
I have access to the information when I need it	200	63.3
I am certain about the reliability of the data documented	226	71.5
I find all the information I need	146	46.2
Information is always updated	149	47.2



Respondents' Satisfaction with EMR Use

Most of the respondents 277 (87.7%) had high satisfaction with using EMR. Of the 316 respondents, 94% agreed that the EMR is useful, 71.8% agreed that

EMR has improved their performance, 69.9% agreed that the use is worth the time and effort required, and 61.4% were satisfied with the system, table IV.

Table 4: Respondents' satisfaction with EMR use

Variables (n=316)	Frequency	Proportion
Overall satisfaction (using the 9-item)		
Low	39	12.3
High	277	87.7
Agreement with individual item		
The EMR is useful	297	94.0
My performance has improved due to the use of EMR	227	71.8
The quality of my work has improved	215	68.0
The EMR is worth the time and effort required to use it	221	69.9
The quality of information has improved	213	67.4
EMR implementation in the facility has been successful	190	60.1
EMR is an important system for the hospital	283	89.6
The safety of patients has improved due to the EMR	156	49.4
I am satisfied with the EMR system	194	61.4

Measures Recommended By Participants To Improve EMR System

The measures recommended by the respondents to improve the EMR were making the interphase more user-friendly, improving internet access, regular

system updates, providing more hardware and periodic training, figure 1.

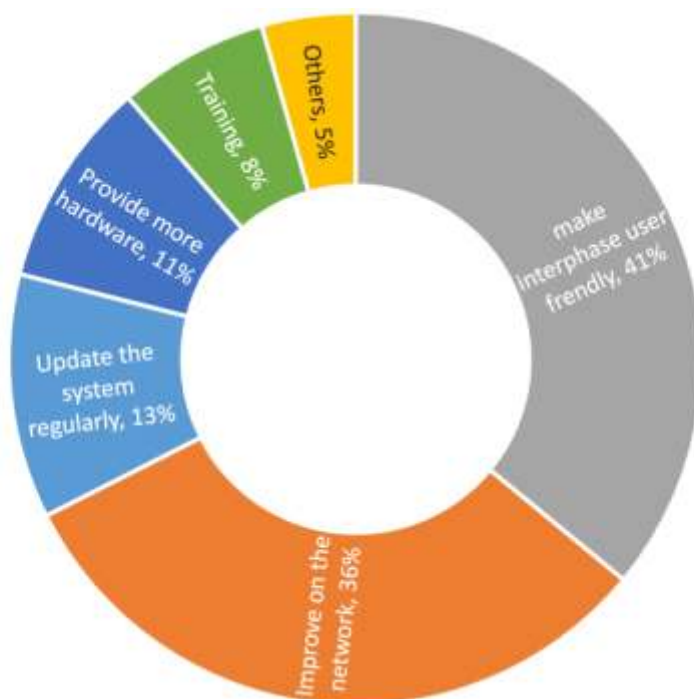


Figure 1: Measures recommended by participants to improve EMR system (n = 192). *multiple responses allowed*



Discussion

This study assessed the perception and satisfaction of EMR among health workers in a tertiary hospital in Ogun State, Nigeria. Most respondents in this study could be said to be computer savvy due to their daily use of computer systems even outside the health facility, and at least seven in ten of them had experience working on EMR for about one year before the onset of this study, this is similar to findings in a study done in Malaysia.¹⁵

Most of the respondents in our study felt that the EMR is useful in patient care, easy to learn, and improves the quality of their work. This is similar to findings in previous studies in Kenya and Malaysia, where most respondents also felt the same way about EMR use in their facilities.^{15,16} Self-efficacy is an important construct when developing new behaviors. User-friendly EMR platforms facilitate efficiency and utilisation. This seems to be the case for the EMR in use in our study, with over eighty percent agreeing that it is easy to use, this probably translated into the high level of satisfaction recorded among the respondents. Electronic medical records have the advantage of making work more efficient. This was affirmed in our study, with 80% of the respondents agreeing that EMR has made their work easier and another 70% reporting that the use of EMR has improved their performance. In a tertiary hospital in Addis Ababa, eighty-three percent reported that EMR has the benefit of decreasing workload and enhancing the efficiency of providers.¹⁶ Therefore, in health systems like Nigeria's, promoting the use of EMR is key to enhancing efficiency in healthcare delivery, especially in the wake of depleting human resources for health occasioned by the pervasive migration of health workforce in search of greener pastures.

Also, in this study, most respondents reported that with the EMR, they have access to patient information when needed, thereby improving work quality and performance. Similarly, majority of health workers in a hospital in Timor Leste, felt that EMR enables easy access to information from past medical records.¹⁷ Access to patient information when needed is very crucial to the continuity of care. Some disadvantages of paper-based records are missing folders or difficulty tracing folders during clinic visits,¹⁸ this poses a great challenge to continuity of care and is easily avoided with the use of EMR as patient data can be accessed when and

where needed as revealed in this study. Majority of the health workers in our study reported good relationships with the ICT personnel. Many said their suggestions were often considered and they had a good response time to their complaints and support from the IT staff. In a qualitative study in rural health facilities in Kenya, respondents also reported that they had adequate on the job training and support on EMR use.¹⁹ Adequate support is important, especially in the initial stages of introducing EMR to encourage health workers to use the platform and resolve all "teething" problems. Prompt response to problems will aid in smooth service delivery for patients and will enhance the working experience of health workers.⁶ Even though, the EMR was generally acceptable to most respondents in this study, a few workers had concerns with delays in updating the information on the system and not having all the information required in patient care occasionally. These concerns were also reported in the study in Oman,¹⁴ and hence it underscores the need to schedule and prioritise regular updates of the EMR system by managers of EMR systems to further enhance user satisfaction.

Overall, perception towards the use of EMR was mostly positive, and the level of satisfaction was very high among our study respondents; which is very encouraging. Similarly, high levels of satisfaction and positive perception have been reported in previous studies across the globe,^{14,15,20} laying credence to how important the EMR system is in enhancing the quality of medical recording systems in hospitals.

Recommendations: This study suggests strengthening EMR systems by improving the internet network, providing more hardware, and training, regularly updating the system, and making the interphase more user-friendly. Adequate hardware, reliable internet connectivity, and training are crucial for seamless operation and service delivery. Regular software updates and a user-friendly interphase are essential for improved user experience.

Strengths and Limitations

This is one of the few studies to assess the perception and satisfaction of EMR among healthcare workers



in Nigeria; thus, it adds significantly to the body of knowledge. Also, the study had a cross-section of the various healthcare workers in the hospital, which is expected to improve its generalizability across various work groups. This study, however, has some limitations; being a cross-sectional study, causal inference cannot be made and also, social desirability could have influenced the responses from the participants.

Conclusion:

In conclusion, our study reported very high levels of satisfaction with EMR and strong positive perception. EMR made work more efficient and was easy to use. This study supports the adoption of EMR in tertiary health facilities. Future investigators could conduct operations research to mitigate the limitations/challenges and evaluate the feasibility of EMR use in lower-level facilities in Nigeria.

Acknowledgement: The authors expressed profound gratitude to the hospital EMR and IT unit for providing us with the necessary data to carry out this research.

The authors also thank our respondents for making themselves available for the research.

Conflict of Interest: None

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Cite this Article as: Azees A. S, Adebisi O. I, Olubodun T., Adeniyi M. A. Healthcare Workers Perception and Satisfaction with the Use of Electronic Medical Records in a Tertiary Hospital in Southwest Nigeria. **Bo Med J** 2024; 21 (1):66-74 **Source of Support:** Nil, **Conflict of Interest:** None declared
