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KNOWLEDGE, ATTITUDE AND PERCEPTION OF ELECTRONIC MEDICAL RECORDS AMONG HEALTHCARE PROFESSIONALS IN NATIONAL EAR CARE CENTRE, KADUNA

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ABSTRACT

Background: Electronic Medical Records (EMRs) have the potential to revolutionize healthcare delivery by improving efficiency, patient safety, and data management. However, the successful implementation and utilization of EMRs depend on healthcare professionals' knowledge, attitude, and perception towards this technology. This study aimed to assess the knowledge, attitude, and perception of healthcare professionals regarding EMRs at the National Ear Care Center (NECC) in Kaduna, Nigeria.

Methods: A cross-sectional survey was conducted among healthcare professionals, including doctors, nurses, pharmacists, and other allied healthcare staff, working at NECC. A structured questionnaire was used to collect data on participants' demographic characteristics, knowledge of EMRs, attitude towards their implementation, and perceptions of their benefits and challenges. Data were analyzed using descriptive statistics.

Results: A total of 109 healthcare professionals participated in the study, with a response rate of 83.9%. The majority of respondents (92.6%) had a high level of knowledge about EMRs, while only 7.2% had a low level of knowledge. Regarding attitude, 65% of participants expressed a positive attitude towards the implementation of EMRs in NECC. However, concerns were raised that healthcare workers prefer paper based type than EMR (75.3%) due to the potential for privacy breaches. Perceived benefits of EMRs included increased work productivity (92.6%), enhanced patient care and safety (87.2%), and it enables tasks to be accomplished more quickly (85.3%).

Conclusion: The study found a positive attitude towards EMR implementation among healthcare professionals at NECC, but highlighted the need for education and training. Concerns were raised about EMRs negatively impacting doctor-patient relationships, suggesting strategies for maintaining strong communication and patient-centered approaches to improve healthcare delivery and efficiency.

Key words: Electronic Medical Record, Healthcare Professionals, Knowledge, Attitude, Perception

ABBREVIATIONS

EMR Electronic Medical Record
EHIMS Electronic Health Information Management Systems
WHO World Health Organization
NECC National Ear Care Center
HER Electronic Health record

HCW Healthcare Workers
HCP Healthcare Professionals
ICT Information and Communication Technology
IT Information Technology
HIT Health Information Technology
FMoH Federal Ministry of Health

INTRODUCTION

Electronic Medical record (EMR) services are expanding rapidly and have the potential to improve the health of the community, enhance scientific understanding of health issues, and facilitate communication between health care providers and patients. The healthcare delivery system of a nation hinges, amongst other things, on how well its hospitals can deliver qualitative and affordable healthcare to its citizens. Thus, the role of hospitals in the healthcare delivery system of a nation cannot be overemphasized [1]. Health records are essential for good healthcare and good quality healthcare data play a vital role in the planning, development and maintenance of optimal healthcare [2]. The amount and quality of information available to healthcare professionals in patient care impact the outcome and continuity of patient care.

Furthermore, medical information needed for clinical decision making continues to increase, especially in developing countries. However, the organization and accessibility of medical information remain poor, usually resulting in inappropriate decisions and medical errors [3].

EMR systems in most developing countries such as Nigeria is in its early stage due to inadequate healthcare infrastructures, health professionals' attitude and awareness level, lack of proper management, resource shortage, skill related issues, users' resistance, policy related issues, poor commitments of staffs, and poor maintenance services among others [4,5]

EMRs are crucial for patient care, but sub-Saharan Africa still lags behind in Health Information Technology (HIT). A study is needed to assess the knowledge, awareness, and perception of EMRs among frontline healthcare workers in Nigeria, as the region accommodates 12% of the world's

population and 27% of the global disease burden [6-8]

The findings of this study will provide a basis for the future adoption and utilization of standardized electronic health records in National Ear Care Centre. The study can lead to a good understanding of the knowledge, awareness and perceptions of EMR and thus offer opportunities and strategies that can enable a successful implementation of the system. In addition, it can serve as a source of information to the Kaduna state government as well as the federal government to develop strategic policies that can enable the delivery of quality healthcare to the people. The aim of the study is to assess the knowledge, awareness and perception of Electronic Medical record among healthcare professionals in National Ear Care Center Kaduna.

METHODS

Study Setting National ear care center (NECC) Kaduna is a public hospital within Kaduna state metropolis which was established in 1999 on the recognition of the World Health Organization (WHO), as a result of the high prevalence of hearing impairment in Africa. The center is the only specialists' hospital in Nigeria for diagnosis, treatment and research into the ear, nose and throat specialty, even though ENT services are available in many teaching hospitals in the country. The center renders many specialist services some of which are; Ear, nose and throat surgeries, audiology related services, school hearing screening services, speech therapy, laboratory, endoscopy, radiology and pharmaceutical services. The center has a 30 bed unit consisting of four (4) wards; Accident and emergency ward, amenity ward, female and children ward and male ward.



Fig 1. A pictorial view of graphical location of National Ear Care Centre Kaduna

Study Population

The population of the study included all available healthcare which comprises of Medical Doctors, Pharmacists, Nurses, Medical Laboratory Scientists, Radiologists and non-healthcare professionals which comprises of Administration staff, Accountants, Medical records personnel etc. were included in the study to gain a broader perspective on the use of Electronic Medical Record (EMR).

Sample Size

The sample size for the study was determined using Cochran formula for cross sectional study.

A total of 109 questionnaires that were completed was analyzed in the study.

The minimum sample size was determined using Cochran formula as shown below:

$$n = Z^2 pq / d^2$$

n = minimum sample size

Z= standard normal deviate = 1.96, corresponding to 95% confidence interval
d = desired precision or margin of error tolerable; at 5%

p = proportion of the study population with a positive attitude to electronic medical record in a previous study i.e. 82.9% [9] =

$$0.829$$

$$q = \text{complementary probability} = 1 - p = 1 - 0.829$$

$$= 0.917$$

$$n = (1.96)^2 \times 0.829 \times 0.917 \div (0.05)^2 = 116.8 + 10\%$$

$$n = 128.5$$

$$n = 130$$

Study Design

A prospective cross sectional study survey was conducted, using a semi structured questionnaire to assess the knowledge, attitude and perception of health care professionals towards electronic medical records. Sampling was done using convenience sampling because it was easy to implement and the population of the institution is relatively small, however there could be high chances of sampling error.

Study Instrument

The study used a quantitative survey method in the form of a close-ended questionnaire to collect data from various healthcare workers in NECC. It contained four sections as follows; A- socio

demographic information, B knowledge on electronic medical records, C- attitude towards use of EMR and D- perception on use of EMRs. The questionnaire was pre-tested in NECC among 35 healthcare workers to check for clarity of questions and to eliminate repetitive and ambiguous questions. Cronbach's alpha statistic was also employed to measure the reliability of the study instrument which was 0.694

Data Collection Procedure

Hard copies of the questionnaires were administered to the participants, a hard copy of the questionnaire was given to an identified representative person of each of the healthcare cadre (e.g. chief resident Doctor, chief medical officer, chief Consultant, In charge Pharmacist of various unit of pharmacy department, In charge medical laboratory scientist of various units in the Medical Laboratory department, In charge nurses of various units in the hospital etc.), to distributed to their staff and the completed questionnaires were collectively collected from the representative person.

Data Analysis

Data analysis was carried out using the SPSS software. Frequency distribution

table were generated for all categorical variables. The mean and standard deviation (SD) were computed for quantitative study.

Ethical Consideration

Ethical clearance was sought and obtained from the ethics and research Committee of the National Ear Care Centre Kaduna with ethical approval number NECC/ADM/214/VI/145 (Appendix II). Written informed consent was obtained from the respondents after explaining the objectives and method of the study to them, also each participants was assured of confidentiality of their personal data.

RESULT

There were 130 questionnaires distributed in all, and 109 were successfully retrieved and evaluated generating an 83.9% response rate.

Demographic Characteristics of the Study Participants

The age range with the highest number of respondents was 36-46 years (48.6%). Majority of the respondents were Admin staff (29.4%), males (54.1%), (44.0%) had attained tertiary level of education, details in (Table 1) below:

Table 1: Demographic characteristics of Participants

		Frequency (n = 109)	Percentage (%)
Gender	Male	59	54.1
	Female	50	45.9
Age	<35	49	45.0
	36-46	53	48.6
	>47	7	6.4
Profession	Physician	9	8.3
	Pharmacist	9	8.3
	Nurse	11	10.1
	Med lab Scientist	12	11.0
	Health Records	15	13.8
	Audit	8	7.3
	Account	13	11.9
	Admin	17	15.6
	Others	15	13.8
Level of Education	Diploma	46	42.2
	Bachelor Degree	48	44.0
	Master Degree	12	11.0
	Fellowship	3	2.8
Years of Experience	0-3years	40	36.7
	4-6 years	20	18.4
	7-10years	34	31.2
	10 years and above	15	13.8

Knowledge

The self-assessments of healthcare professionals using a dichotomous questions on knowledge revealed that 92.6% of the healthcare professionals have an excellent knowledge on what EMR is and its uses. The detail is in Table 2.

Table 2: Health Care Professional Knowledge on use of EMR

Knowledge	YES (%)	NO (%)
I have heard about Electronic Medical Records.	97.2	2.8
An EMR is a digital record of patient's clinical data, management plan and treatment.	97.2	2.8
I know about the presence of Electronic Medical Records in our hospital.	85.3	14.7
Electronic medical record is synonymous with electronic health record.	89.9	10.1
Personal data, clinical data, laboratory data, radiology data, billing and payment receipts are components of EMRs.	93.6	3.7

Attitude

Respondent's attitude towards the use of EMR indicated that 45.9% agreed that the use of Electronic medical records will make patient management and follow up easier and 51.4% indicated that using e-health system will improves work performance. About 62% (61.5%) strongly disagree with the statement that EMR when introduced aids faster patient care, and about 1% (0.9%) of the respondents felt that EMR is detrimental to healthcare in the long run see Table 3.

Table 3: Healthcare professionals Attitudes towards the use of EMR

Attitudes	Disagree (%)	Neutral (%)	Agree (%)
Electronic medical records will make patient management and follow up easier	51.4	2.8	45.9
EMR when introduced aids faster patient care	61.5	3.7	34.9
Healthcare workers prefer EMR than the paper based type	56	19.3	24.8
Using e-health system improves my work performance	45	3.7	51.4
Training healthcare workers on EMR should be mandatory	45	9.2	45.9
Using e-health system improves the quality of the work I do	55	3.7	41.3
EMR is detrimental to healthcare in the long run	29.4	54.1	0.9

Perception

About 46% (45.9%) of the respondents strongly agree with the statement that Using e-health system enables me to accomplish tasks more quickly, and 53.2% Agree that using e-health system enhances my effectiveness on the job, while only 7.3% strongly agree that I feel electronic medical record affects doctor-patient relationship negatively see Table 4

Table 4: Perception of Healthcare professionals on the use of EMR

Perception	SD (%)	D (%)	A (%)	SA (%)
Using e-health system increases my work productivity	3.7	2.8	48.6	44
I feel electronic charting would lead to better patient care and safety	1.8	10.1	51.4	35.8
Using e-health system enhances my effectiveness on the job	2.8	3.7	53.2	39.4
I believe electronic medical record	14.7	38.5	34.9	11

increases cost of care for the patient				
I feel electronic medical record affects doctor-patient relationship negatively	22	46.8	22.9	7.3
I feel electronic medical record does not protect patient privacy	20.2	53.2	13.8	11.9
When in use, I believe EMR will have a poor cultural acceptability	20.2	47.7	25.7	5.5
I believe that EMR should be used in the routine care of patient in our hospitals	5.5	5.5	46.8	41.3
I think EMR should only be used for specialized care of patients	14.7	58.7	17.4	8.3
Using e-health system enables me to accomplish tasks more quickly	6.4	7.3	39.4	45.9

Key: SD-strongly Disagree, D-Disagree, A-Agree, SA- Strongly Agree

DISCUSSION

The use of electronic medical record (EMR) in Nigeria has been a topic of interest, and several studies have been conducted to assess the knowledge, attitude and perception of healthcare professionals towards EMR. Electronic medical records system is one of the essential pathways to achieving and optimizing the delivery of quality of health care [10]. The introduction of EMRs in the study setting in 2021 necessitates a thorough evaluation of the knowledge of EMRs among its healthcare workers. The successful implementation and utilization of EMRs will heavily rely on the understanding and proficiency of the workforce in utilizing this technology. It is crucial to assess and address any gaps in knowledge to ensure the effective integration of EMRs into daily practice. This study focus mainly on the knowledge, attitude and perception of EMR among healthcare workers in NECC and also to access the relationship between profession and knowledge of EMR among the respondents.

The study found that 92.6% of respondents in the National Ear Care Center, Kaduna, have excellent knowledge about electronic medical records (EMRs). This indicated that healthcare professionals are well-informed and knowledgeable about the concept, purpose, and functionalities of EMRs. This knowledge is higher than the 71.5% found in a study conducted in Plateau State [9], suggesting that NECC had better access to information and also utilizes it in this era of unlimited medical information. The implication of the findings of this study to practice is that a relatively good knowledge base of EMRs exists, which will provide a good and smooth take off of such system, which has just being introduced.

Additionally, attitudes of the respondents towards electronic medical records (EMRs) provides insights into their perceptions and beliefs about the impact of EMRs on patient management, patient care, healthcare in the long run, and their own work performance, According to the survey data, approximately half of the respondents,

specifically 45.9%, expressed a certain sentiment or perception that the use of EMRs would make patient management and follow-up easier. This suggests that an average proportion of the healthcare professionals in the NECC, Kaduna, recognized the potential benefits of EMRs in improving the efficiency and effectiveness of patient management processes. This finding is similar to the study obtained in 2016 by Farahnaz *et al* in Tehran. Which showed that 40.4% had good attitude and practice habits [11]. The belief that EMRs can streamline patient management aligns with the widely acknowledged advantages of EMRs, such as easy access to patient information, improved coordination of care, and enhanced communication among healthcare providers [12].

The majority of respondents (61.5%) disagree with the claim that EMRs improve patient care speed, suggesting that initial implementation may not be immediate due to factors like learning curves or system integration challenges, necessitating adequate training and support.

Nonetheless, only a small proportion of the respondents (0.9%) felt that EMRs are detrimental to healthcare system in the long run. This suggests that the majority of healthcare professionals in the NECC, Kaduna, do not perceive EMRs as negatively impacting healthcare delivery. Similarly, a study in Benghazi in 2005 reported that only 4% of the respondents had negative attitude [13]. This result aligns with the growing body of research supporting the positive impacts of EMRs, including improved accuracy, accessibility, and continuity of patient information.

An average 45.9% of respondents strongly agree that using an e-health system improves efficiency and time-saving, aligning with the advantages of Electronic Medical Records (EMRs), such as quick access to patient information and improved

data management.

Only 7.3% of respondents disagree that electronic medical records negatively impact the doctor-patient relationship. However, concerns about increased screen time, distractions, and reduced face-to-face interaction can be addressed through appropriate training, communication, and workflow design to mitigate any negative effects [14].

The majority of respondents (53.2%) believe that e-health systems improve their job effectiveness due to improved patient data access, decision support tools, automated reminders, and efficient communication. However, a small proportion of respondents believe EMRs negatively affect doctor-patient relationships, requiring strategies to maintain strong communication and a patient-centered approach. . To preserve a patient-centered approach, strategies like establishing a personal connection, active listening, and allowing patients to set the visit agenda are recommended

CONCLUSION

The study highlighted the importance of ongoing education and training initiatives introduced at NECC, Kaduna to enhance EMR implementation, utilization and promoting a culture of understanding and effective usage of EMR in healthcare delivery.

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