IJHRIM

Intl J Health Recs & Info Mgt. Jan – Dec 2024;7(1):44-48

Research article

Print ISSN 2645-2464; E ISSN 2695-1770

Knowledge, attitude and perception of healthcare workers toward electronic medical record pre and post-adoption: A survey of Federal Medical Centre Bida, Nigeria

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ABSTRACT

Background/Objectives: Electronic medical record is a formal record of patients' interactions with the healthcare providers, it is in an electronic format and it is digitally stored and shared among authorized persons for different users..The adoption of EMR systems in Nigeria's healthcare sector has been an ongoing journey, with many hospitals transitioning from paper-based records to digital systems over the past decade. This study aimed at determining knowledge, attitude and perception of electronic medical record among healthcare workers pre and post-adoption, providing insights into how these factors have evolved and their impact on clinical practice. ***Design/Methods:*** This research adopted a cross-sectional descriptive design with a comparative component. The study used quantitative method to assess the KAP of healthcare workers pre- and post-EMR adoption. ***Results:*** The study reveals a high familiarity with EMR among participants, with 60.6% reporting being very familiar with the system however, only 44.1% of participants had received formal training, pointing to a significant gap in capacity-building initiatives. Attitudes of healthcare workers were largely positive. Post-adoption perceptions of EMR were generally favorable, with participants acknowledging its role in improving work efficiency and patient care however, transition from paper to digital systems was seen as moderately challenging, with technical and workflow issues cited as potential barriers. . ***Conclusion:*** The study demonstrates a predominantly positive reception of EMR systems among healthcare workers, but highlights areas for improvement in training, technical support, and implementation strategies. Addressing these areas can ensure the sustained success of EMR adoption and its contribution to better healthcare outcomes.

Keywords: Attitude of healthcare providers; Electronic medical records; Health data quality; Health information technologies; Health outcome

Edited by *QB Suleiman-Abdul; submitted on 29.09.2024; peer reviewed by M Achinbee, Usman Isah; accepted 28.11.2024; published 02.12.2024.*

Please cite as: *Adebisi AA, Adeleke IT, AbdulGhaneey OO, Adeleye JA, Adeleye ET, Salami SA. Knowledge, attitude and perception of healthcare workers toward electronic medical record pre and post-adoption: A survey of Federal Medical Centre Bida, Nigeria. Int J Health Recs & Info Mgt. 2024;7(1):44-48.*

Conflict of interest: None declared.

Funding disclosure: No funding was solicited for nor obtained for this study

INTRODUCTION

The healthcare industry globally has seen significant advancements through the adoption of information and communication technology (ICT), with Electronic Medical Records (EMR) being at the forefront. The EMR systems streamline patient data management, enhance clinical decision-making and promote efficiency in healthcare delivery. The implementation of EMR systems has faced numerous challenges, particularly in developing countries like Nigeria. The adoption of EMR systems has been relatively gradual, with various challenges including infrastructure deficits, resistance to change, and lack of adequate training for healthcare professionals. Its adoption, however, holds immense potential for transforming health service delivery by providing accurate, timely, and organized patient data[1].

The adoption of EMR systems in Nigeria's healthcare sector has been an ongoing journey, with many hospitals transitioning from paper-based records to digital systems over the past decade. Electronic medical record is a formal record of patients' interactions with the healthcare providers, it is in an electronic format and it is digitally stored and shared among authorized persons for different users. Electronic health record (EHR) is interchangeably used with EMR, there is a slight difference between the two concepts. The difference is that EMR is within a

healthcare facility, while EHR transverses different facilities. It is a nationwide shared record on citizens' health[2]. Both EMR and EHR are the patients' health information that is collected, stored, accessed and used electronically[3]. As stated in a study, EHR is the digitized patient records with Physician/Clinical Documentation (PD/CD), Clinical Data Repository (CDR), Clinical Decision Support System (CDSS) and Computerized Physician Order Entry (CPOE) components[4]. The technologies contain patient's demographic information, progress/clinical notes, medical problems, medications, vital signs, immunization records and reports of laboratory and radiology investigations[5].

For several decades, EMR has been touted as key to increasing of quality care[6]. Electronic medical records are used for other reasons than charting for patients[7]. In today's healthcare system, providers are using data from patient records to improve quality outcomes through their care management programs. It combines all patients demographics into a large pool, and uses this information to assist with the creation of "new treatments or innovation in healthcare delivery" which overall improves the goals in healthcare[7]. Combining multiple types of clinical data from the system's health records has helped clinicians identify and stratify chronically ill patients.

These systems are designed to store data accurately and to capture the state of a patient across time. It eliminates the need to track down a patient's previous paper medical records and assists in ensuring data is up-to-date, accurate and legible[8]. It also allows open communication between the patient and the provider, while providing "privacy and security[8]." It can reduce risk of data replication as there is only one modifiable file, which means the file is more likely up to date and decreases risk of lost paperwork and it is cost efficient[8]. Due to the digital information being searchable and in a single file, EMRs are more effective, when extracting medical data for the examination of possible trends and long term changes in a patient. Population-based studies of medical records may also be facilitated by the widespread adoption of EMRs.

While there is still a considerable amount of debate around the superiority of electronic medical records over paper records, the research literature paints a more realistic picture of the benefits and downsides[9]. The increased transparency, portability, and accessibility acquired by the adoption of EMR may increase the ease with which they can be accessed by healthcare professionals, but also can increase the amount of stolen information by unauthorized persons or unscrupulous users versus paper medical records[10,11].

Concerns about security contribute to the resistance shown to their adoption. Handwritten paper medical records may be poorly legible, which can contribute to medical errors[12]. Pre-printed forms, standardization of abbreviations and standards for penmanship were encouraged to improve the reliability of paper medical records. An example of possible medical errors is the administration of medication. With paper documentation it is very easy to not properly document the administration of medication, the time given, or errors such as giving the "wrong drug, dose, form, or not checking for allergies" and could affect the patient negatively. It has been reported that these errors have been reduced by "55-83%" because records are now online and require certain steps to avoid these errors[13].

The adoption of EMR systems in Nigeria's healthcare sector has been an ongoing journey, with many hospitals transitioning from paper-based records to digital systems over the past decade. Federal Medical Centre, Bida implemented EMR in the General Out-Patient Clinic (GOPC) and NHIC clinics in 2021. The system was intended to improve clinical decision-making and patient management, there is however limited evidence on the knowledge, attitude, and perception (KAP) of healthcare professionals (HCPs) before and after the adoption of the EMR system. Understanding these factors is crucial to evaluating the success of EMR implementation and identifying areas for improvement. This study aimed at determining knowledge, attitude and perception of electronic medical record among healthcare workers pre and post-adoption, providing insights into how these factors have evolved and their impact on clinical practice.

METHODS

Study Design

This research adopted a cross-sectional descriptive design with a comparative component. The study used quantitative method to assess the KAP of healthcare workers pre- and post-EMR adoption.

Study Population

The study recruited all healthcare workers, who work in the General Out-Patient Clinic (GOPC) and National Health Insurance Unit (NHIA) of the hospital. Participants include those, who have been working at the hospital before and after the EMR implementation.

Data collection tools

The instrument for data collection employed in this study was questionnaire. This serve as the primary source of data collection and for which conclusion were drawn. The questionnaire was divided into four (4) Sections (A & D) respectively. Section A contains the socio-demographic information of the participants, section B, C & D access the knowledge, attitude and perception of EMR among the participants. The self-administered questionnaire was developed based on previous studies related to EMR adoption[1&32]. The questionnaire will assess three key domains:

1. **Knowledge** of EMR systems
2. **Attitudes** towards EMR adoption
3. **Perception** of EMR's impact on clinical practice

The questionnaire used a Likert scale (1 = strongly disagree to 5 = strongly agree) to capture responses. The instrument will be validated through pilot testing with a small group of healthcare professionals before the actual study.

Sampling Technique

The sampling technique adopted for this study was simple random sampling technique. This method is appropriate because it provide a systematic and effective approach of collecting a sample that accurately reflect the characteristics of the entire population thereby enhancing the reliability and validity of research findings.

Sample size

The sample size for this study was the entire healthcare staff at the study area, who were on duty during the time of the study. They were thirty-four (34) health workers at the general out-patient clinic of Federal Medical Centre Bida.

Inclusion and exclusion criteria

Health workers on evening shift, on sick bed, and on leave were excluded from partaking in the study.

Data analysis and management

Data was analyzed using descriptive such as Mean to determine KAP scores.

Ethical consideration

Informed consent was obtained from all the participants after a detail explanation of the purpose of the study. Consequently, all participants were assured by the researchers that information supplied will be treated as confidential and for academic purpose thereby, seeking the willingness, sincerity and cooperation of the respondent.

RESULTS

1. How familiar are you with EMR system
   Very Familiar (20, 60.6%)
   Somewhat familiar (12, 36.4%)
   Not familiar (0, 0%)
   No response (13.0%)
2. Have you received formal training on the use of EMR?
   Yes (15, 44.1%)
   No (18, 52.9%)
   No response (12.9%)
3. Are you aware of the benefit of using EMR in clinical practice?
   Yes (24, 75%)
   No (7, 21.9%)
   No response (1, 3.1%).
4. How would you rate your understanding of EMR functionality at FMCB?
   Excellent (3, 9.1)
   Good (21, 63.3%)
   Fair (6, 18.2%)
   Poor (3, 9.1%)

DISCUSSION

The study aimed to assess the knowledge, attitude, and perception (KAP) of healthcare workers towards electronic medical records (EMR) systems before and after their adoption at the Federal Medical Centre, Bida. The findings highlight critical insights into the transition from paper-based to digital records and the resultant impacts on healthcare delivery.

Knowledge of EMR

The results indicated a high familiarity with EMR among participants, with 60.6% reporting being "very familiar" with the system. However, only 44.1% of participants had received formal training, pointing to a significant gap in capacity-building initiatives. This disparity underscores the importance of structured and continuous training programs to ensure that all

healthcare workers are equipped to utilize EMR effectively. Despite the training gaps, there was widespread awareness (75%) of the benefits of EMR in clinical practice, which aligns with previous studies emphasizing the potential of EMR systems to enhance healthcare outcomes[1&2].

Attitude towards EMR Adoption

The attitudes of healthcare workers were largely positive. The study revealed strong agreement regarding the role of EMR in improving patient care quality and facilitating work efficiency. Most participants preferred EMR to traditional paper records, which are consistent with findings[14], who noted that electronic systems reduce errors and enhance clinical documentation. However, a minority expressed neutral or negative attitudes, highlighting the need for targeted interventions to address resistance and ensure broader acceptance.

Perception Post-Adoption

Post-adoption perceptions of EMR were generally favorable, with participants acknowledging its role in improving work efficiency and patient care. However, the transition from paper to digital systems was seen as moderately challenging, with technical and workflow issues cited as potential barriers. Similar challenges have been documented in other settings, as noted by a study[4]. Addressing these issues through robust technical support and stakeholder engagement during the implementation phase is crucial.

Implications for Practice

The findings suggest a clear need for enhanced training and support mechanisms to maximize the benefits of EMR systems. The positive reception of EMR indicates a willingness among healthcare workers to embrace digital tools, provided that adequate resources and support are available. This is crucial for sustaining the momentum of digital transformation in healthcare and improving clinical outcomes.

Limitations to the study

This is a single-centred study and findings may not be generalized for EMR adoption.

CONCLUSION

The study demonstrates a predominantly positive reception of EMR systems among healthcare workers, but highlights areas for improvement in training, technical support, and implementation strategies. Addressing these areas can ensure the sustained success of EMR adoption and its contribution to better healthcare outcomes.

Recommendations

Based on the findings of this study, the following recommendations are proposed to enhance the knowledge, attitude, and perception of healthcare workers at the Federal Medical Centre, Bida toward EMR systems and to optimize the system's adoption and integration:

1. Comprehensive Training Programs for all healthcare providers.
2. Establish a robust technical support system.
3. Engage healthcare workers in the EMR adoption process by seeking their input on workflow design and functionality.
4. Reinforce the benefits of EMR systems through educational campaigns and workshops.
5. Develop clear transition plans, when moving from paper-based to EMR systems.
6. Conduct periodic assessments of healthcare workers' KAP of EMR systems to identify gaps and areas for improvement.
7. Address the concerns of healthcare workers, who exhibit neutrality or negative attitudes toward EMR through targeted interventions, such as personalized training or mentorship programs.
8. Encourage collaboration between departments to share best practices and success stories regarding EMR use.
9. By implementing these recommendations, Federal Medical Centre, Bida can foster greater acceptance, efficient use, and a stronger positive impact of EMR systems on healthcare delivery.

Acknowledgement

The authors wish to appreciate HIM professionals, who assisted during data collection and all participants are duly appreciated.

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Authors Contribution:

AAA conceived of the study, initiated the design, participated in literature search, and data collection, analysis and coordination. AIT, AOO, AJA, AET and SSA participated in the design, literature search, data collection, technical process, data analysis and coordination and reviewed the final manuscript.

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