HEALTHCARE ATTITUDE TOWARDS USING ELECTRONIC MEDICAL RECORDS: META ANALYSIS

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ABSTRACT
Information and Communication Technology (ICT) in the healthcare system has increased worldwide. EMR system is a digital health technology utilized in the health sector to collect, generate and present health related data by the health professionals along with exchanging information with authorized personnel within the health care setting. This study aimed to analyzed to the healthcare attitude towards using electronic medical records. This was a systematic review and meta-analysis. The PICO research question as follows. The PICO research question as follows population: Healthcare, Intervention: Yes, Comparison: No, Outcome: Using EMR. The article Were obtained from our databases: PubMed and Google Scholar. The Keywords were "Attitude" OR "Health workers" OR "Electronic Medical Record". Full text article in English with study design cross sectional from 2014 to 2024, were included in this study. The steps of meta-analysis followed PRISMA flow diagram. The article Were analyzed by the Review Manager 5.4. Application a total 5 cross sectional from Ethiopia were selected for a systematic review and meta-analysis. The data collected showed that a good or positive attitude have a willingness to use EMR of 6.32 times compared to health workers who have a bad attitude (aOR = 6.32; CI95% = 4.3 to 9.02). The heterogeneity of the research data shows $I2 = 64\%$, so the data distribution is declared heterogeneous (random effect model).

Keywords: attitude; electronic medical records; healthcare

INTRODUCTION

Information and Communication Technology (ICT) in the healthcare system has increased worldwide. These include telehealth, mobile health applications, electronic medical records, and health information management system. The demand for technologies that can accommodate for the large volume of information generated by the health care system has increased in the 21st century. This need had motivated countries to adopt an innovative way of handling medical records known as electronic medical recording (EMR) (WHO, 2016). A survey conducted by the World Health Organization (WHO) in 2012 indicated 45% of countries used electronic systems for patient's data management. Besides, 30% of countries have been collecting and communicating patient information via electronic systems (World Health Organization, 2012) (Evans, 2016). In Ethiopia, the five-year perspective strategic plan known as health sector transformation plan, which had been implemented from 2015 to 2020, envisioned utilization of electronic health management information system and strengthening the electronic medical record (EMR) system in the healthcare industry.EMR system is a digital health technology utilized in the health sector to collect, generate and present health related data by the health professionals along with exchanging information with authorized personnel within the health care setting (WHO, 2016). EMR, which is a patient's health and health-related information record data set system, is operating based on an application of computer software. In other words, it is as an electronic software program developed for the

storage, processing, and exchange of medical and medical-related information, and the patients' data can be created, gathered, managed, and consulted by authorized clinicians or staff within healthcare organizations (Waithera et al., 2017) (Bazile, 2016).

EMR has proven benefits to improve the quality of service by improving efficiency and productivity through timely decision-making, saving recurring costs, reducing medical errors, increasing patients' safety, ensuring data confidentiality, and sharing medical information between authorized personnel (Castelnuovo et al., 2012) (Bagayoko et al., 2011). These benefits are more pronounced in developing and low-income areas like sub-Saharan countries which are constantly ravaged by pandemics and epidemics (Behrens, 1968). Globally, less than half of the world countries has adopted a national EMR system according to a 2016 WHO report, although there have been improvements over the past decade (WHO Global Observatory on eHealth, 2015). The report had also shown disparities in the adoption of the system among countries. Globally, Israel, Canada, Denmark, and Australia had notable achievements in the implementation of electronic health records (Fragidis & Chatzoglou, 2018). However, the adoption of EMR system in developing countries was low. This low level of implementation is attributed to the high level of both budget and human resources required by the system which includes large financial investment, better infrastructures including electricity and internet connectivity, and skilled manpower (Anwar & Shamim, 2011), (Oak, 2007).

Although Health information system has been used for long period to generate aggregate data to be used at different administrative levels, the implementation of EMR in Ethiopia is still young. EMR with a name of smart-care, which was later called Tena-care, was first piloted in Ethiopia in 2009 by the Ministry of Health (MOH) with a support from Tulane University technical assistance project in Ethiopia (TUTAPE) (Senafekesh et al., 2014), (Abore et al., 2022). Currently, the role of digital technologies is given great emphasis after the MOH acknowledged benefits of digitization and the ministry set out to change the culture of information generation and utilization for evidence based decision making at all levels (Abore et al., 2022). he quality and availability of health information would significantly impact the quality of health care provision. Individual level data including but not limited to demographic, clinical, laboratory investigation, imaging, and medication history and billing were targeted (Awol et al., 2020). Readiness assesses the level of preparedness and how welcoming a given institution and its professionals will be to the changes brought by adopting a new technology (Kgasi & Kalema, 2014). The need for this pre-implementation assessment emanates mainly from the resource intensive nature of the process and its dependence on human and organizational factors for its success; equally to the technical aspect. The probability of failure of EMR system could be minimized if an appropriate pre-implementation assessment of readiness is done and the concerns and gaps of practitioners are addressed properly (Ghazisaeidi et al., 2014).

The Electronic-Based Government System in the Health Sector is an effort to implement the obligations of Presidential Regulation Number 95 of 2018 concerning the electronic-based government system. The Ministry of Health must accelerate the implementation of the Electronic-Based Government System (Jdih.Kemkes.Go.Id, 2023). Electronic medical records (EMRs) are important to implement because of their ability to reduce physician workload, costs and errors. Paper-based reporting has many drawbacks, including manual data entry and requiring manual processing. Therefore, a systematic review of electronic medical record (EMR) systems for patient satisfaction and quality of care is important to know the extent of its application. This study aimed to analyzed to the healthcare attitude towards using

electronic medical records

METHOD

This is a systematic review and meta-analysis. The articles were obtained from Google Scholar and PubMed database from 2014-2024. The keywords in the search for this article are "Attitude" OR "Health workers" OR "Electronic Medical Record". The inclusion criteria for this research article are: full text article using a cross sectional study, full text article available, results of analysis used adjusted odds ratio (aOR). The exclusion criteria were: statistical results reported in the form of bivariate analysis. Articles published in languages other than English. Articles published before 2013. Article searches were carried out based on eligibility criteria using the PICO Model. Population: Health workers. Intervention: Good attitude. Comparison: Bad attitude. Outcome: Willingness to Use Electronic Medical Records. This research was conducted using guidelines from the PRISMA diagram and the quality of the using critical appraisal for cross sectional sourced from the Center for Evidence Based Management (CEBMa). The research results were analysis using the Review Manager Application (Review Manager 5.4). Forest plots and funnel plots were used to determine the size of the mine effect and heterogeneity of the data. The fixed effect model is used to determine homogeneous data, while the random effect model is used to determine heterogeneous data.

RESULT

The article search process was carried out through several journal databases. The review process for related articles can be seen in the PRISMA flow diagram in Figure 1. Research related to the good attitude of healthcare can using EMR. A total of 5 articles that met the quality assessment were included in the quantitative synthesis using meta-analysis. Research articles come from Ethiopia (5).
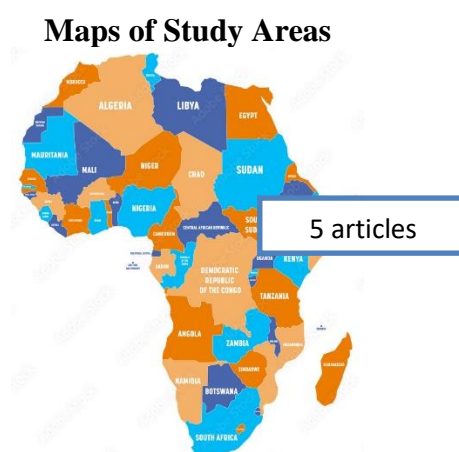
Maps of Study Areas

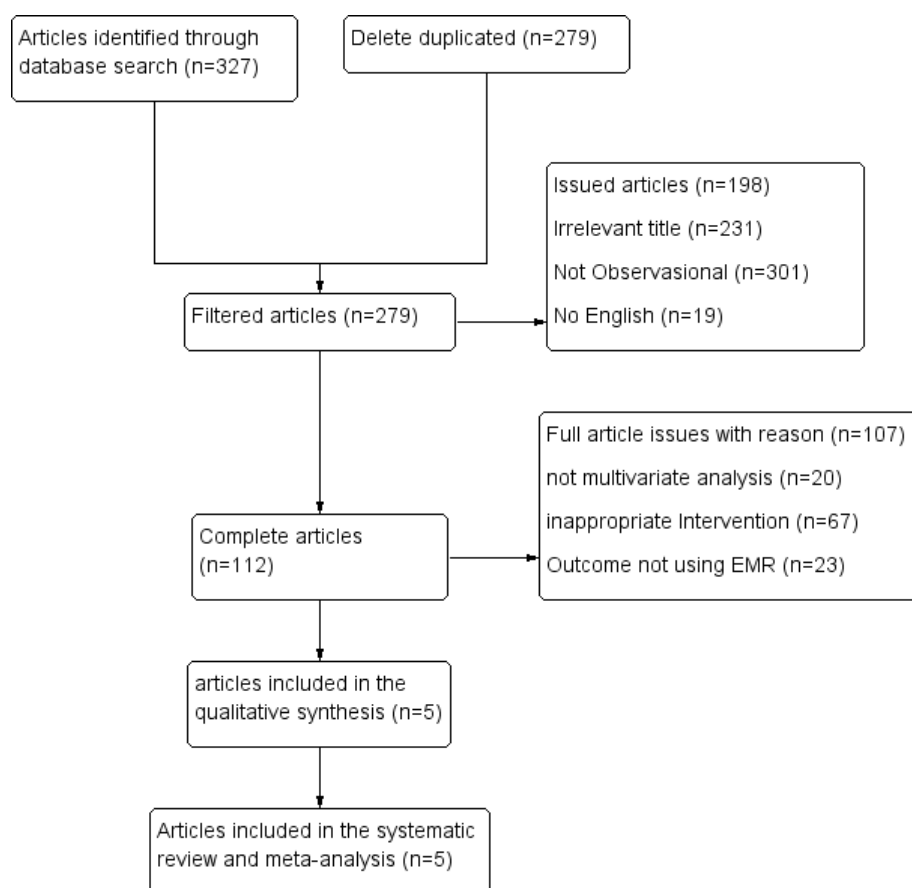Figure 1. Maps of Study Area Healthcare Attitude Towards Using EMR

Figure 2. Prima Flow Diagrams

Figure 1 depicted the research articles collected from Ethiopia (5). Table 1 Research assesses the quality of research. Table 2 show that 5 observational provide the effect of healthcare can good attitude toward using EMR.

Table 1.
Description of primary Studies included in the Meta-analysis

Author (Years)	Country	Design Study	Sample	P	I	C	O
Abore (2022)	Ethiopia	Cross sectional	306	Healthcare	Yes	No	Using EMR
Awol (2020)	Ethiopia	Cross sectional	414	Healthcare	Yes	No	Using EMR
Biruk (2014)	Ethiopia	Cross sectional	606	Healthcare	Yes	No	Using EMR
Ngusie (2022)	Ethiopia	Cross sectional	423	Healthcare	Yes	No	Using EMR
Oumer (2021)	Ethiopia	Cross sectional	412	Healthcare	Yes	No	Using EMR

Table 2.
Critical Appraisal Checklist for Cross Sectional in Meta-Analysis

Author (Year)	Critical Appraisal Item												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Abore (2022)	2	2	2	2	2	2	2	2	2	2	2	2	24
Awol (2020)	2	2	2	2	2	2	2	2	2	2	2	1	23
Biruk (2014)	2	2	2	1	2	2	2	2	2	2	2	2	23
Ngusie (2022)	2	2	2	2	2	2	2	2	2	2	2	2	24
Oumer (2021)	2	2	2	2	2	2	2	2	2	2	2	2	24

Description of Critical Appraisal Criteria
1. Does the research address a clearly focused question/problem?
2. Is the research method (research design) appropriate to answer the research question?
3. Is the subject selection method clearly explained?
4. Is exposure measured accurately (correctly) to prevent/minimize bias?
5. Is the subject sample representative of the population to which the findings will refer?
6. Was the sample size based on pre-study considerations of statistical power?
7. Was a satisfactory response rate achieved?
8. Are outcomes measured accurately (correctly) to prevent/minimize bias?
9. Was statistical significance assessed?
10. Are confidence intervals provided for the main results?
11. Could there be confounding factors that have not been accounted for?
12. Can the results be applied in your organization?

Note:
Score 2=Yes, Score 1=Can't be explained/Hesitant, Score 0=No.
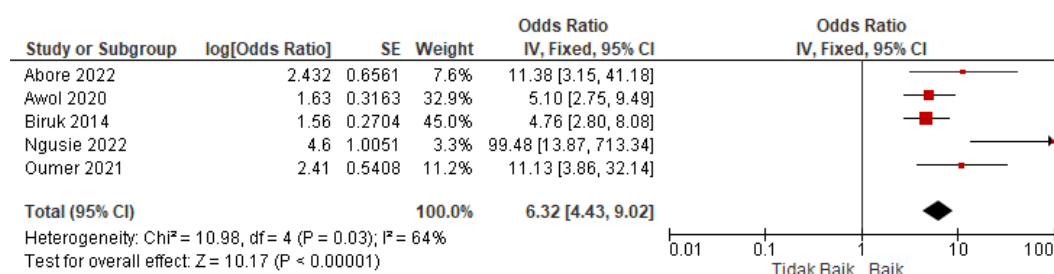

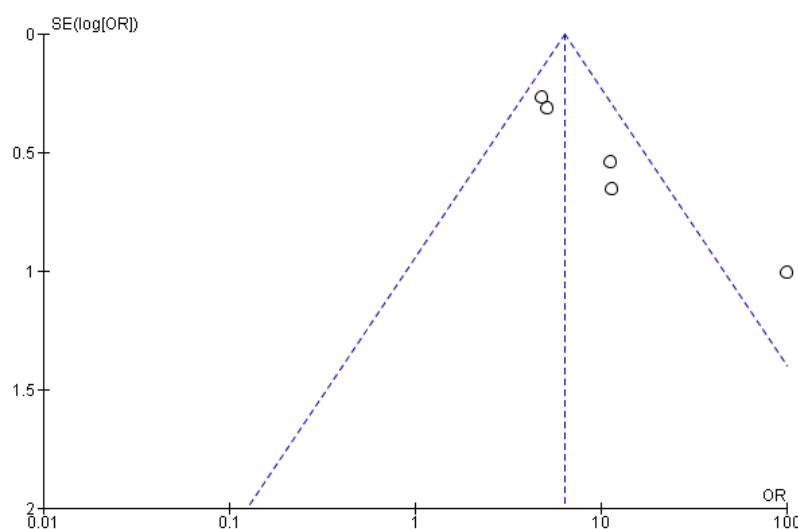Figure 3. Forest Plot of Healthcare Attitude Towards Using Electronic Medical

Figure 4. Funnel Plot of Healthcare Attitude Towards Using Electronic Medical

The Forest Plot in the image above shows that there is a relationship between attitude and willingness to use EMR, and the relationship is statistically significant. This is indicated by the pooled effect size of the entire study (diamond = 4.43-9.02) not touching the vertical line on the forest plot. Health workers who have a good or positive attitude have a willingness to use EMR of 6.32 times compared to health workers who have a bad attitude (aOR = 6.32; CI95% = 4.3 to 9.02). The heterogeneity of the research data shows $I2 = 64\%$, so the data distribution is declared heterogeneous (random effect model). The Funnel Plot shows no

publication bias as indicated by the symmetrical results between the right and left plots.

Meta-analysis is a powerful and informative tool for basic and applied research. It provides a statistical framework for synthesizing and comparing the results of studies that have all tested a particular hypothesis. Meta-analysis has the potential to be particularly useful for experts, because individual experiments often rely on small sample sizes due to time and labor constraints, resulting in low statistical power (Harrison, 2011). The advantage of meta-analysis is that it can provide the strongest scientific evidence about the effects of an intervention or exposure across all study designs and facilitate practitioners in using research evidence in evidence-based practice (Murti, 2018).

This study uses samples of articles or previous studies sourced from Google Scholar and PubMed. The research data was processed using the Rev-Man 5.3 application, then the results in the meta-analysis study were presented in the form of forest plots and funnel plots. Forest plots are a form of graphical presentation of results (Murad et al., 2014). Forest plots visually show the magnitude of variation (heterogeneity) between study results. Forest plots are usually used to display epidemiological data that are often used in systematic reviews to summarize previously published research results. While the funnel plot shows the effect size of the study and the sample size or standard error of the effect size of various studies. Then the diagram showing the symmetrical plot position indicates no publication bias (Murti, 2018).

The results of a meta-analysis study on the relationship between attitudes and willingness to use EMR in health workers showed a value (aOR = 6.32; CI95% = 4.43 to 9.02). This means that health workers who have a good/positive attitude have a willingness to use EMR 6.32 times compared to health workers who do not have a good attitude. The results of this meta-analysis study have proven that health workers who have a good/positive attitude have a greater willingness to use EMR. Those who have good knowledge and attitudes are significantly related to the use of EMR (Abore et al., 2022) (MOODY et al., 2004). The findings of the above study are reinforced by other findings that research participants who have good knowledge and attitudes about the EMR system are more likely to use the EMR system. This is similar to research conducted in South Florida (MOODY et al., 2004).

Attitude can describe the reflection of a person's feelings in the form of positive or negative values towards a particular object, and this attitude affects a person's path in achieving their goals. This is related to how a person reacts to external stimuli. A person who has a positive attitude will react more rationally to incoming information and think about the various benefits that can be obtained from it. A positive attitude has a positive impact. A positive attitude will show actions that always lead to efforts to achieve goals. Health workers who have a positive attitude towards the use of EMR and know the benefits of using EMR are more willing to implement the implementation of EMR use. This will later make it easier to achieve the goals of the Ministry of Health.

Research conducted by (Gedikci Ondogan et al., 2023) the use of EMR increases along with the regulation of administrative and legal principles along with the development of digital health care systems and increasing emphasis on the confidentiality, integrity, and accessibility of medical records. It is seen that the attitude of health workers towards EMR also affects the use of EMR (Strong et al., 2014).

A study conducted by (Alrasheeday et al., 2023) found that 81.1% of nurses had an overall positive attitude towards the use of EHR, which implies that nurses view EHR positively and are willing to incorporate it into their daily operations. In healthcare settings, nurses are among the largest potential adopters of electronic health record systems. Based on the results of the attitude questionnaire, most of these nurses agreed that computerized documentation was necessary and acceptable, similar to a Palestinian study (Salameh et al., 2019). In addition, nurses in Jordan have accepted EHR due to its perceived utility and ease of use. Nurses who said that the EHR system helped them perform better in their clinical nursing work were more likely to think that the EHR system helped them perform better in their clinical nursing careers (Nguyen et al., 2021). In addition, positive insights were expressed by nurses in Australia about the adoption of EMR in their workplace environment as a result of their expectations that EMR can help them in significant ways, such as timely and legible documentation, and to provide assistance in improving patient safety and care delivery (Jedwab et al., 2021). In contrast, 18.9% of nurses had negative attitudes, implying that EHRs were met with resistance or reluctance from nurses.

According to (Lindén-lahti et al., 2022) the shift from paper to digital documentation has the main goals: to further improve communication, reduce errors, and ensure that patients receive consistent care. The authors conclude that nursing records should be enhanced in a way that takes into account the wants and needs of nurses, the impact of any new capabilities on existing workflows, and consistency with domain-specific representation models of standard data.For continued improvement of EHR usage, a training needs assessment is recommended to meet the current needs of nurses. One important issue that may affect the capacity of nurses to adapt and feel comfortable using EHR is their previous level of computer literacy. This gap can be closed and successful integration into the EHR system ensured by providing appropriate training and support for nurses who may have limited computer literacy. In the context, hospital authorities can identify certain factors that limit nurses when using EHR. Addressing these issues with a tailored program can improve patient outcomes and patient safety.

CONCLUSION
Meta-analysis conducted using 5 articles originating from Ethiopia (African Continent) to examine the attitudes of health workers towards the willingness to use EMR. However, there are still some limitations in this study.

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