Review

Health Workers' Knowledge about The Use of Electronic Medical Records: A Literature Review

Alfina Aisatus Saadah\textsuperscript{1*}, Titin Wahyuni\textsuperscript{1}, Abidatu Zahrotul Firdaus\textsuperscript{1}, & Novi Eka Yulianita\textsuperscript{1}

\textsuperscript{1}STIKES Yayasan RS Dr. Soetomo, Surabaya, Indonesia

<table>
<thead>
<tr>
<th>Article Info</th>
<th>Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article history:</td>
<td><em>Introduction:</em> The knowledge of health workers will affect their skills in carrying out the quality of medical records. The development of knowledge is so fast that health workers will quickly fall behind if they do not take advantage of various things to update the latest developments. The purpose of this study was to identify the knowledge of health workers about the use of electronic medical records (EMR).</td>
</tr>
<tr>
<td>Received: 18 May 2024</td>
<td><em>Methods:</em> This study used a literature review design with a qualitative approach to the data obtained in the form of literature review study data collection. Researchers collected 15 articles or scientific journals that have been published to analyze the knowledge of health workers in using EMR.</td>
</tr>
<tr>
<td>Accepted: 20 July 2024</td>
<td><em>Results:</em> The percentage of health workers who knew about the use of EMR was more than 50% in 10 articles and less than 50% in 5 articles.</td>
</tr>
</tbody>
</table>

| Keywords: | Conclusion: The percentage of health workers who know about the use of EMR is relatively high. The level of knowledge is still low due to the lack of training and computer skills for officers and the lack of understanding by officers regarding the benefits of EMR for health facilities. |
| electronic medical record, health workers, Knowledge | |

*Corresponding Author:
e-mail: aisatusalfina@gmail.com

This work is licensed under a Creative Commons Attribution 4.0 International License.
INTRODUCTION

One of the services in healthcare facilities that can be integrated with information technology is medical records. An electronic medical record (EMR) is a computerized health information system that contains demographic and medical data and can be equipped with a decision support system. Healthcare facilities implement EMR in an effort to improve service quality, increase patient satisfaction, improve documentation accuracy, reduce clinical errors, and speed up data access [1].

In using computerized EMR, many obstacles are encountered, and the implementation of Electronic Medical Records experiences many obstacles, including unplanned organizational work culture, infrastructure whose needs have not been identified, and human resources, both IT and medical recorders, which are not sufficient [2].

Users are an essential aspect of realizing the ideal EMR. Users are the primary key to the success or failure of an information system. By understanding user perceptions, the proper recommendations can be found to maximize the adoption of EMR in improving the quality of patient care [1].

Given the importance of medical records, it is necessary to make progress in terms of knowledge in the application of EMR. In line research conducted by Audina (2020) shows the results that nurses' knowledge nursing documentation 29 respondents found seven respondents with poor nursing documentation knowledge, while for the completeness of data in electronic medical records, 11 incomplete documents were obtained [3]. The knowledge of health workers will affect their skills in carrying out the quality of medical records [4].

The development of knowledge is so fast that health workers will quickly fall behind if they do not take advantage of various things to update the latest developments. Knowledge is the result of knowing, and it occurs after someone senses a specific object [5]. Therefore, this research aims to determine the knowledge of health workers regarding the use of EMR from various aspects, including education level, level of knowledge, and skills in using computerization.

METHODS

This study used a literature review design where researchers collected, selected, and examined various national-level scientific articles or journals to produce scientific work [6]. Researchers analyzed previous journals so that they found similarities in the journals, and then they gave their own opinions and drew conclusions about the journals that had been read [7]. The journals obtained are then screened for eligibility and then re-selected based on the critical appraisal journal [8].

Types and Design of Research

The research method used in this research was analytical research with qualitative methods. It used a literature study data collection strategy by collecting secondary data from previous research that is relevant to the topic raised in this research in order to determine the knowledge of health workers in the use of medical records. Electronics and
journals will be selected by adjusting predetermined criteria. The database used is Google Scholar based on the themes or keywords used in this research, namely the knowledge of health workers regarding the use of Electronic Medical Records, with a total of 15 articles or scientific journals with four international level journals and 11 national level journals. The journal used has been published for the last ten years, 2014-2024.

**Manuscript Inclusion Criteria**
The criteria used in this research are within the scope of medical records and health information with health workers as research subjects. Research locations are hospitals, health centers and clinics. The articles were in Indonesian or English and have a publication period of the last ten years, from 2014 to 2024, with the theme of health workers' knowledge about the use of electronic medical records. Keywords used in journal searches are knowledge, health workers, and electronic medical records. The research designs are qualitative, quantitative, cross-sectional, and mixed methods.

**Manuscript Screening Stages**

![Manuscript Screening Stages Diagram]

**Fig. 1. Manuscript Screening Stages**
RESULT

Based on the table 1, journal numbers 1,2,9,12,14 (5 journals) show that the knowledge of health workers in hospitals, health centers and clinics is more than 50%, while journal numbers 3,4,5,6,7,8,10,11 13,15 (10 journals) found that the knowledge of health workers was less than 50%.

Table 1
Result of this study

<table>
<thead>
<tr>
<th>No</th>
<th>Author Name &amp; Year</th>
<th>Title</th>
<th>Research design</th>
<th>Research subject</th>
<th>Place of research</th>
<th>Research result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Birhanu Berihun, Desta Debalkie Atrafu, and Getachew Sitotaw (2020)[9]</td>
<td>Willingness to Use Electronic Medical Record (EMR) System in Healthcare Facilities of Bahir Dar City, Northwest Ethiopia.</td>
<td>cross-sectional</td>
<td>healthcare professionals</td>
<td>hospitals: Adinas, Gamby, and Felege-Hiwot; public health centers: Bahir Dar and Han health centers; and clinic: Marie Stopes International Clinic, The result of the technical factor of willingness to use the Electronic Medical Record system is 45.9%, where health workers have good knowledge about using the Electronic Medical Record system.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Ika Sudirahayu, Ayu Harjoko (2016)[10]</td>
<td>Readiness Analysis of Electronic Medical Record Implementation Using DOQ-IT at Dr. H. Abdul Moeloek Hospital.</td>
<td>qualitative</td>
<td>Doctors, nurses, medical record officers and technicians</td>
<td>RSUD Dr.H.Abdul Moeloek</td>
<td>Of the 31 total staff available, only 14 (45%) staff knew about Electronic Medical Records. HR readiness is in range I, where there is no strong understanding of Electronic Medical Records.</td>
</tr>
<tr>
<td>3.</td>
<td>Indah Kurniawati, Yayuk Fatmawati (2022) [11]</td>
<td>Overview of the Level of Knowledge of Nurses on the Use of Electronic Medical Record (EMR) Methods in the Inpatient Room of Mardi Rahayu Kudus Hospital</td>
<td>quantitative</td>
<td>Nurses</td>
<td>Mardirahayu Kudus Hospital</td>
<td>According to the results showed that 34 respondents (55.7%) knew the use of RME.</td>
</tr>
<tr>
<td>4.</td>
<td>Michael Malvin</td>
<td>Overview of the Knowledge and Qualitative Health workers</td>
<td>qualitative</td>
<td>RSGM FKG USAKTI</td>
<td>51.7% of health workers were</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Author Name &amp; Year</td>
<td>Title</td>
<td>Research design</td>
<td>Research subject</td>
<td>Place of research</td>
<td>Research result</td>
</tr>
<tr>
<td>----</td>
<td>-------------------</td>
<td>-------</td>
<td>-----------------</td>
<td>------------------</td>
<td>-------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>5.</td>
<td>Made Karma Maha Wirajaya, Ni Made Umi Kartika Dewi (2020) [13]</td>
<td>Analysis of Readiness of Dharma Kerti Hospital to Implement Electronic Medical Records</td>
<td>quantitative and qualitative</td>
<td>Director, Head of Finance, Head of medical services, Head of IT, Medical Records Officer, Doctor, Nurse</td>
<td>Dharma Kerti Hospital</td>
<td>From the total score of 87, there is 16.6 for HR readiness; namely, in terms of training, it is found that there is still no training that is directly related to Electronic Medical Records. However, in terms of knowledge, almost all respondents understand the importance of electronic medical records and the benefits gained from the implementation. There were 62.3% of health professionals who were ready to use the electronic medical record system, 62.6% of participants who had good knowledge related to Electronic Medical Records, 60.1% of participants who had attitudes that supported Electronic Medical Records.</td>
</tr>
<tr>
<td>6.</td>
<td>Shekur Mohammad Awol, Abreham Yeneneh Birhanu, Zeleke Abebaw Mekonnen, Kassuhaan Dessie Gashu, Atsede Mzenga Shiferaw, Berhanu Fikadie Endehabtu, Mulugeta Haylom Kalayou,</td>
<td>Health Professionals’ Readiness and Its Associated Factors to Implement Electronic Medical Record Systems in Four Selected Primary Hospitals in Ethiopia</td>
<td>cross-sectional health professionals</td>
<td>primary hospitals were Assosa, Hidar 11, Sanja, and Wogera</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Author Name &amp; Year</td>
<td>Title</td>
<td>Research design</td>
<td>Research subject</td>
<td>Place of research</td>
<td>Research result</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
<td>-------</td>
<td>-----------------</td>
<td>------------------</td>
<td>------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>7.</td>
<td>Senafekesh Biruk, Tesfahun Yilma, Mulusew Andualem, and Binyam Tilahun (2014)[15]</td>
<td>Health Professionals Readiness to Implement Electronic Medical Record System At Three Hospitals in Ethiopia: a Cross-Sectional Study</td>
<td>cross-sectional quantitative</td>
<td>health professionals</td>
<td>Hospitals</td>
<td>Out of 606 study participants, only 328 (54.1%) were found to be aware of the use of electronic medical record systems. The overall knowledge and readiness of health workers for electronic medical records and their utilization were 54.1% and 46.5%, respectively. Based on the results of the analysis using DOQ-IT in the human resources aspect, it is considered very ready with a score of 4.69. Officers at the Pratama Polkesmar Clinic are very enthusiastic about the change from the manual medical record system to RME. In terms of knowledge about RME, almost all respondents</td>
</tr>
<tr>
<td>8.</td>
<td>Melinda Asrining Hapsari, Kismi Mubarokah (2023)[16]</td>
<td>Analysis of Readiness for Implementing Electronic Medical Records (RME) Using the Doctor's Office Quality-Information Technology (DOQ-IT) Method at the Pratama Polkesmar Clinic</td>
<td>Quantitative</td>
<td>11 respondents consisting of the leadership and all Pratama Polkesmar Clinic officers</td>
<td>Pratama Polkesmar Clinic</td>
<td>Based on the results of the analysis using DOQ-IT in the human resources aspect, it is considered very ready with a score of 4.69. Officers at the Pratama Polkesmar Clinic are very enthusiastic about the change from the manual medical record system to RME. In terms of knowledge about RME, almost all respondents</td>
</tr>
<tr>
<td>No.</td>
<td>Author Name &amp; Year</td>
<td>Title</td>
<td>Research design</td>
<td>Research subject</td>
<td>Place of research</td>
<td>Research result</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------</td>
<td>-------</td>
<td>-----------------</td>
<td>------------------</td>
<td>-------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>9.</td>
<td>Nurvita Wikansari, Nanda Surya Febrianta (2024) [17]</td>
<td>Analysis of Readiness for Implementing Electronic Medical Records at the Pajangan Community Health Center, Bantul Regency</td>
<td>Qualitative</td>
<td>Medical record officers, doctors, nurses, and heads of administration</td>
<td>Pajangan Health Center, Bantul Regency</td>
<td>Understand the importance of RME and also the benefits obtained from implementing it. Most officers are also proficient in operating computers. Based on research results, the Pajangan Community Health Center only has 1 medical recorder with an educational background in medical records and health information. One of the factors that inhibits the use of RME is the Human Resources (HR) factor. Medical records officers must have an educational background in medical records. If not, it will hinder the implementation of RME due to a lack of understanding and knowledge regarding electronic medical records.</td>
</tr>
<tr>
<td>10.</td>
<td>Dody Arief Rahman, Ni Wayan Kurnia Widiya Wati, Try Wahyu Qur’ana, Khairunnisa (2023) [18]</td>
<td>Analysis of Readiness of Medical Records in Transitioning Conventional Medical Records to Electronic</td>
<td>Mix methods</td>
<td>One outpatient registration officer, one inpatient registration officer, and two outpatient filling officers. And one Head of Medical Bhayangkara Hospital Tk. III Banjarmasin</td>
<td></td>
<td>Based on the results of the study of 5 respondents who have excellent knowledge of 3 people 60 (%) and respondents</td>
</tr>
<tr>
<td>No</td>
<td>Author Name &amp; Year</td>
<td>Title</td>
<td>Research design</td>
<td>Research subject</td>
<td>Place of research</td>
<td>Research result</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Teguh Putri Anggari (2023) [19]</td>
<td>Medical Records at Bhayangkara Tk Hospital. III Banjarmasin: Overview of Knowledge and Attitude of Medical Record Officers About Electronic Medical Records in Banjar City RSU Blood 2023</td>
<td>Quantitative</td>
<td>30 medical records officers.</td>
<td>BLUD RSU Kota Banjar</td>
<td>Based on the results of the Knowledge and Attitude study, the majority of respondents were categorized as 60.0%, while the sufficient and low categories were 16.7% and 23.3%, respectively.</td>
</tr>
<tr>
<td>12</td>
<td>Sri Siswati, Tuty Ernawati, Muthia Khairunnisa (2024) [20]</td>
<td>Analysis of the Challenges of Preparedness for Implementation of Electronic Medical Records in Puskesmas Padang City</td>
<td>Mixed method</td>
<td>69 samples, that is, doctors, medical recorders, and nurses, while the qualitative was done on 46 informants, 23 heads of the puskesmas and 23 medical records.</td>
<td>Puskesmas of the City of Padang</td>
<td>Based on the results of Univariat's analysis of the level of knowledge and perception, the majority of respondents had a poor knowledge (53.6%) and a positive perception (53.6%).</td>
</tr>
<tr>
<td>13</td>
<td>Riskiya Amalia (2023) [21]</td>
<td>Review of Preparedness for Implementation of Electronic Medical Records of Road Care at RSUD Dr. MUHAMMAD ZYN SAMPANG</td>
<td>Qualitative</td>
<td>Head of medical records, registration officer, poly nurse</td>
<td>RSUD Dr. MUHAMMAD ZYN SAMPANG</td>
<td>Based on the research results, officers already have knowledge of outpatient electronic medical records. Officers are competent in operating computers. Registration of outpatients has been carried out at SIMRS.</td>
</tr>
<tr>
<td>14</td>
<td>Lakhmudien, Rano Indradi, Ega Nugraha</td>
<td>Medical Recorders' Understanding of the Background of the 6 D3 Medical Records background officers</td>
<td>Qualitative</td>
<td>6 D3 Medical Records background officers</td>
<td>Kudus Regency Hospital</td>
<td>Based on the research results from respondents</td>
</tr>
<tr>
<td>No</td>
<td>Author Name &amp; Year</td>
<td>Title</td>
<td>Research design</td>
<td>Research subject</td>
<td>Place of research</td>
<td>Research result</td>
</tr>
<tr>
<td>----</td>
<td>--------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Imam Agus Setiyono (2023) [22]</td>
<td>Implementation of Electronic Medical Records Based on Minister of Health Regulation Number 24 of 2022</td>
<td>Research design</td>
<td>Research subject</td>
<td>Place of research</td>
<td>showed that the majority of medical recorders do not understand and have not received proper socialization about electronic medical records. Regarding the EMR design concept, most of the informants stated that they still haven’t mastered it because it requires a lot of human resources involved, namely doctors, IT, medical recorders, nurses, and hospital directors.</td>
</tr>
<tr>
<td>15</td>
<td>Mu'awiyah BS, Hussein AT, Abdulazeez AO, Istifanus AJ (2021) [23]</td>
<td>Knowledge, Attitude and Perception of Healthcare Workers on the Use of Electronic Medical Records in Ahmadu Bello University Teaching Hospital, Zaria, Kaduna State Northwest Nigeria</td>
<td>Cross-sectional study</td>
<td>128 healthcare workers that were randomly selected</td>
<td>Ahmadu Bello University Teaching Hospital, Zaria.</td>
<td>The majority of respondents have at least fair knowledge and good perception regarding EMR despite all of them having good attitudes towards it.</td>
</tr>
</tbody>
</table>
From the results of the study, it was found that the percentage of health workers who knew about the use of EMR was more than 50% in 10 journals and less than 50% in 5 journals.

Tenure affects officers because someone who works longer will have more knowledge than those who have just worked. Length of work is a process of building knowledge or skills about work methods with employee involvement in carrying out their duties so that with hard work, they can improve techniques and work methods [24]. The level of knowledge is influenced by several factors, namely education, occupation, age, interest, experience (tenure), environmental culture, and information [25]

One of the factors determining the success of EMR implementation is the attitude of users in using the EMR system, so it is necessary to conduct socialization and training to system users gradually to increase user knowledge and competence in operating the system. One of the challenges in implementing EMR is the lack of knowledge and experience of health workers in using computers [26]. In 2023, the implementation of the EMR program was complex and expensive; only 47% of countries that have a digital health strategy will have implemented an EMR system. Middle and high-income countries have implemented this EMR system only in the last five years, which are called (upper-middle - and high-income countries)[27]. Additionally, there is inadequate infrastructure, inadequate resources and regulatory frameworks. Human resource factors are also categorized as significant challenges in the use of Electronic Medical Records, especially regarding the level of knowledge, level of education, work experience, and perceptions, which also influence the readiness of health workers to use Electronic Medical Records [28].

The reasons and challenges for using Electronic Medical Records in Indonesia are related to low knowledge of Electronic Medical Records because officers do not receive training on this matter, lack of computer skills of health workers, and lack of knowledge about computers and the benefits of Electronic Medical Records for medical facility [22]. The level of education is also an obstacle in the use of electronic medical records; medical record officers must have an educational background in medical records. Otherwise, it will hinder the implementation of Electronic Medical Records due to a lack of understanding and knowledge regarding Electronic Medical Records [29]. This is in line with research by [17] that in the Pajangan Community Health Center, Bantul Regency, there is still one medical records officer with a D3 medical records background. In contrast, the average of 4 officers who assist in the medical records section are high school graduates.

Solutions used to increase officer knowledge can be done through seminars, training, workshops, or other scientific activities. Knowledge about EMR is an entity that resides in EMR user officers. Thus, knowledge about EMR is related to the speed and accuracy of using EMR [30]. Education, training, skills, motivation, and experience can affect a person’s characteristics at work. Training is a series of activities that provide
opportunities to gain and improve job-related skills [31].

Dessler said that there are three main aspects in shaping human resource competence. The first is the knowledge of officers in carrying out duties and responsibilities in accordance with their fields. The second aspect is the skill in carrying out the duties and responsibilities assigned to the officer. The last aspect is the attitude of officers in carrying out their duties and responsibilities in accordance with the regulations. Training can be interpreted as a planned effort to facilitate learning about work related to employee knowledge, skills, and behavior [6].

STUDY LIMITATIONS

The study was not without its limitations. A broad view is essential to get as much depth of the topic as possible. The study was limited by limited references regarding health workers' knowledge of electronic medical records and a lack of specific issues and subjects in research regarding who the health workers in question are.

Nursing Implication

Our research can be used as input in patient care services for nursing sessions and discussions with other health workers when using electronic medical records. Nurses who provide care in documenting care must be documented in electronic medical records so that the care provided can be integrated with other healthcare providers to avoid errors in medical diagnoses and care actions.

CONCLUSION

Based on the conclusions of this research, the knowledge level of EMR use in health facilities is still low due to a lack of training and computer skills and a lack of understanding regarding the benefits of EMR for health facilities. Various aspects of forming health workers' knowledge in using EMR include human resources, skills aspects, and officers' attitude aspects in carrying out their duties and responsibilities. Based on the results of analysis of scientific articles or journals conducted by researchers, it was found that the percentage of health workers' knowledge regarding the use of EMR in health facilities was relatively high.

Researchers suggest improving the quality of human resources by enhancing health workers' knowledge regarding the use of Electronic Medical Records (EMR) through regular training and seminars. Additionally, thorough screening of human resources based on their educational levels should be conducted, ensuring that 3rd Year Diploma graduates in medical records and health information, as well as other relevant majors, are placed in appropriate positions within hospitals, clinics, and health centers. To ensure the effective utilization of EMR systems, it is essential to maintain and implement regular monitoring and evaluation of human resources, focusing on their knowledge and education levels in EMR usage within health facilities.

ACKNOWLEDGMENT

We would like to thank our research team colleagues who have helped with this
research and also my husband for accompanying us in carrying out this research.

FUNDING

The funding for this research is the researcher's funds. Although the literature review requires a small amount of funds, the energy and thought that the researcher has spent is not tiny.

CONFLICT OF INTEREST

Any authors have declared no conflict of interest

AUTHOR CONTRIBUTION

Each author significantly contributed to the following aspects of the paper: formulating and planning the study, reviewing the article's content and conducting research.

ETHICAL APPROVAL

No ethics approval is required as this is an Article Review.

REFERENCES


