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# Electronic Medical Records in First Level Health Facilities

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**ABSTRACT**

Medical records are an important element in the process of health care in health facilities. Several primary health facilities have used electronic-based medical records to improve service quality. Electronic medical records are patient medical records in electronic form that include health information of an individual that can be accessed using a computer from a network to provide effective, efficient, and integrated health services. The purpose of the study was to determine the development of the use of electronic medical records in primary healthcare facilities in Indonesia with a systematic review before the mandatory use of electronic medical records in Indonesia. Methods: This research is a systematic literature review of the use of electronic medical records in primary health facilities. Researchers searched the literature on google scholar with the keyword electronic medical records and obtained a total of 60 articles, 4 of which were inaccessible, 40 articles were not conducted in primary health facilities, and 3 articles did not contain the aspect we looked for so only 13 articles were used in literature studies. Results: The implementation of medical records is carried out by all health workers who provide services from registration, triage, clinical examination, treatment, and drug prescribing. Medical record data is distributed automatically by computer. Health workers have different electronic medical record display menus according to their duties. Conclusions: The implementation of electronic medical records in primary health facilities can be carried out by medical recorders and non-medical health workers who are trained and have a different electronic medical record display menu in each service flow.

**Keywords:** electronic medical records, health workers, primary care

## INTRODUCTION

Medical records are an important element in the health service process in health facilities. Medical records act as a data source in the process of processing data and information that is useful for management in developing health services[1]. Several first-level health facilities in Indonesia, such as clinics and doctors' practices, have used electronic-based medical records to support better quality health services. Electronic medical records are patient medical records in electronic form which include an individual's health information which can be accessed using a computer from a network to provide effective, efficient and integrated health services[2]. First level health facilities are health facilities that carry out non-specialized Community Health Efforts (UKM) and/or Individual Health Efforts (UKP) for the purposes of observation, diagnosis, treatment, medication and/or other health services[3].

According to the Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022 concerning medical records, medical records are documents that contain patient identity data, examinations, treatment, procedures and other services that have been provided to patients[4]. Meanwhile, electronic medical records are medical records created using an electronic system intended for providing medical record services[4]. Medical record services start from registration, triage, to returning medical record documents to the medical record storage room. The concept of electronic medical records was first revealed by the Institute of Medicine. In implementing the use of electronic medical records, a transition process is required, such as the introduction of electronic medical records, training in the use of electronic medical records so that health workers are proficient in applying electronic medical records. The use of electronic medical records was first implemented in a Utah Hospital, United States in 1967 with Health Evaluation through Logical Programming (HELP) software[5]. Meanwhile, the first use of electronic medical records in Indonesia is not yet known for certain. Developments in the use of electronic medical records have occurred in both developed and developing countries.

## METHOD

The aim of this research is to determine the development

of the use of electronic medical records in Indonesia before the use of RME is mandatory according to Minister of Health Regulation No. 24 of 2022. The research method is by systematic literature review where researchers conducted a literature search on Google Scholar with the keyword "electronic medical record". The flow of the literature search method can be seen in more detail in the image below.

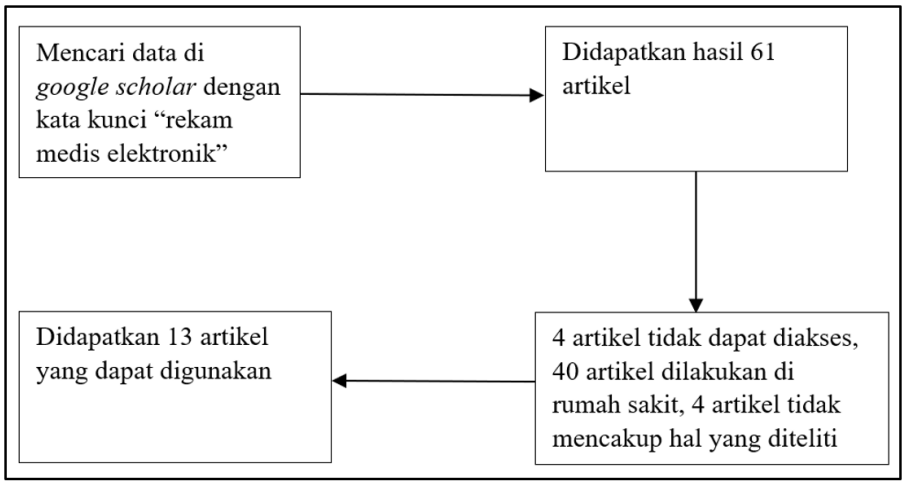


**Figure 1. Flow of literature search methods**

## RESULT

| No | Previous article | Menu | Organizer | Benefit |
|---|---|---|---|---|
| 1. | Farid ZM, Fernando NR, and Sonia D. Effectiveness of Using Electronic Medical Records for Outpatient Services at the Darul Arqam Clinic in Garut. 2021. | – | Clinics use the My Klinik application[6] | Officers only need a short time to search for patient medical records[6] |
| 2. | Santoso DB, Hartati S, and Claramita M. Development of an Electronic Medical Record Prototype at the Korpagama Family Doctor Clinic, Gadjah Mada University. 2017. | Registration, Patient identity, Allergy list, Visit history, Initial examination, Diagnosis, Follow-up[7] | RME uses p-Care BPJS software based on MySQL data and is carried out by registration officers and doctors[7] | – |
| 3. | Nurhayati, Arif YWT, and Yunizar AY. Design and Development of Electronic Medical Record Websites in Doctor's Practice Health Service Facilities. 2020. | New patient registration, Search for old patient data, Physical examination, Diagnosis, Actions, Drug data[8] | The RME website was built with a PHP program based on MySQL data and carried out by doctors, registration officers and pharmacists[8] | – |
| 4. | Erawantini F and Wibowo NS. Implementation of Electronic Medical Records with Clinical Decision Support | Patient identity, new patient registration, RM number, physical | Carried out by doctors, registration officers, nurses and pharmacists who have | – |
| 6. | Pusparani C, Priyambadha, Arwan A. Development of an Electronic Medical Record Application System and Web-Based Online Patient Registration (Case Study: Elisa Medical Clinic Malang). 2019. | Registration, Clinical media assessment, Outpatient education, Diagnostics, Pharmacy[11] | The RME system is based on MySQL data with PHP and JavaScript programming languages. RME can be accessed by registration officers, nurses, doctors, laboratory assistants and guests[11] | – |
| 7. | Prawiradirjo DWAD, Kartiko BH, and Feoh G. Design of a Web-Based Outpatient Electronic Medical Record Information System at the Bright Smiles Bali Dental Clinic. 2018. | Patient registration, Search for patient data, RM number, Patient identity, Outpatient RM registration, ICD 9 CM code search, ICD 10 code search, Medication, Doctor's notes, Nurse's notes, Payment[12] | The RME system is carried out computerized by registration officers and doctors[12] | The use of RME reduces registration time from 5-8 minutes to 2-3 minutes[12] |

| | | | | |
|---|---|---|---|---|
| 8. | Widowati V. Effect of speed of filing electronic medical records and outpatient manual medical records on the timeliness of collecting JKN files at the Bethesda Hospital Intern Clinic. 2015. | – | RMIK (Medical Records and Health Information) section officers can access RME to print RME and doctors record RME[13] | Service activities are more effective due to better time management[13]<br><br>Proof of diagnostic services printed from RME can be valid legal evidence[13] |
| 9. | Pandiastuti DN, Ratnasari CI, and Kusumadewi S. Implementation of the Electronic Medical Record System for the Healthy Clinic in Salatiga City. 2019. | New patient registration, patient identity, initial examination, medical history, procedures, patient visit chart, medication use[14] | Performed by doctors, dentists, registration officers, nurses[14] | Doctors and other health workers do not need a long time to obtain patient information/medical records. The system does not experience errors[14] |
| 10. | Danarahmanto PA, Pratami JF, Prihadi MD, and Nurfadillah N. The Effect of Electronic Medical Records on Patient Loyalty at Tami Dental Care. 2021. | – | – | RME makes it easier for registration officers to search for patient data, thereby saving service time[1] |
| 11. | Erawanti F, Nugroho E, Sanjaya GY, and Hariyanto S. Electronic Medical Records: Study of Benefits in the Context of Basic Health Services. 2013. | – | RME is carried out by doctors, nurses and administrative officers[15] | Health workers involved in RME need fast time in searching for patient data and history[15] |
| 12. | Apriliyani S. Use of Electronic Medical Records to Support the Effectiveness of Outpatient Registration at Dr Ranny Clinic. 2021. | New patient registration, Old patient search, RM number, Patient identity, Allergy list, Visit history, Diagnosis, Management[2] | RME is carried out by doctors, nurses and registration officers[2] | In using RME the speed and accuracy of data increases because for certain data the officer only needs to select the options provided[2] |
| 13. | Arif YWT, Suryadi A, and Meitasari. Computerized Web-Based Outpatient Registration in Doctor's Practices. 2019. | Outpatient registration, RM number, patient identity, payment[16] | The study only describes the use of RME by registration officers[16] | – |

## DISCUSSION

### A. Definition of Electronic Medical Records

Electronic medical records are electronic notes or recordings that contain information about a person's health that are created, collected, managed, used and referred to by authorized health workers in a health service organization[17]. Apart from health information, electronic medical records also include personal data, demographic and social data. The contents of the medical record at least include the patient's identity, results of physical and supporting examinations, diagnosis, treatment, follow-up plan, name and signature of the health worker providing the service[4]. Patient data in electronic medical records must be stored for a period of 25 years[4]. The electronic medical record system has a function that supports medical decision making activities, making it easier for health workers. Setyawan stated that electronic medical records are activities to computerize health track records and processes related to them[17]. Electronic medical records are an information system with a broad framework and fulfill a set of functions and are not an information system that can be purchased. Electronic medical records are medical record documents that can be accessed using a computer with the aim of improving the quality of care and health services[18].

Electronic medical records have criteria, namely integrating data from various sources, collecting data at the point of service, and supporting service providers in decision making[17]. A study by Handiwidjojo defines electronic medical records as an application environment consisting of clinical data storage, clinical decision support systems, standardization of medical terms, computerized data input, and medical and pharmaceutical documentation[19]. Handiwidjojo also mentioned that electronic medical records are the use of information technology devices for collecting, storing, processing and accessing data stored in patient medical records in a health service facility. Research by Apriliyani revealed the definition of electronic medical records as records of a patient's lifetime medical records in electronic format containing an individual's health information written down by one or more health workers during each treatment[2]. Electronic medical records are a computerized health information system that contains demographic data, medical data, and can be equipped with a clinical decision support system[20].

### B. Implementation of Electronic Medical Records

The implementation of electronic medical records in health facilities is carried out by a separate work unit or adjusted to the needs and capabilities of each health facility. Electronic medical records are maintained when

patients arrive, go home, are referred or die. The Minister of Health facilitates the implementation of electronic medical records in health facilities by providing electronic systems and service platforms, interoperability standards and health data integration[4]. According to Minister of Health Regulation Number 55 of 2013 concerning Medical Recorder Work, the implementation of medical record and health information work is carried out by a medical recorder who has passed medical record and health information education[20]. Medical record workers need to obtain a Medical Recorder Registration Certificate and a Medical Recorder Work Permit to carry out their work[20]. However, when using electronic medical records, it is known that the implementation of medical records can also be carried out by health workers who are not medical recorders who have received training in medical record management[2].

In running the electronic medical record program, health workers need to log in on the home page using a username and password. Research by Apriliyani describes the flow of electronic medical record services as follows. First, the medical record book is delivered to each polyclinic by the medical records officer. Then the medical record book arrived at the clinic and was held by a team of paramedics who were used to take anamnesis on the patient. After completing the patient history, the medical record book and patient are taken to the medical team (doctor) for examination. After examination, the doctor diagnosed the patient. After that, the doctor enters the patient's data into the electronic medical record[2]. Implementation of RME uses p-Care BPJS software[7,10] and is based on MySQL data[7,8,11]. There are also clinics that build RME with the My Klinik application[6].

### C. Electronic Medical Records Menu

The menu in the electronic medical record system is different for each health worker. The RME menu in the registration section includes new patient registration and an old patient search column[2,8,9,12]. In the clinical examination section, the RME menu includes disease history, physical examination, diagnosis, management[7,8,9,10,11,14]. Other additional RME menus include allergy list, payment, pharmacy/drug prescriptions and supporting examinations[2,7,9,10,11,16]. There is also an RME diagnosis menu with ICD 9 and ICD 10 search codes[12].

### D. Benefits of Electronic Medical Records

From most studies, it is known that using electronic medical records can save time, especially in the process of searching for patient data and medical records, thereby influencing the registration or registration process to be more efficient and effective[1,2,6,12,13,14,15]. In the RME menu in the registration section, officers only need to select the options that already exist in several patient data[2]. Apart from service time, printed RME can be used as valid evidence[13].

## CONCLUSIONS

1. Electronic medical records are documents or patient medical records in electronic form that include individual health information and can be accessed using a computer to provide effective, integrated and sustainable health services.
2. Electronic medical records have been used in first-level health facilities, such as clinics and doctor's practices and are implemented by doctors, nurses, registration officers and pharmacists.
3. The electronic medical record display menu is adapted to the duties of health workers.
4. Printed RME can be used as valid evidence and can speed up the search for patient data and medical records

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