

Review of Electronic Medical Records in Indonesia and its Developments Based on Legal Regulations in Indonesia and its Harmonization with Electronic Health Records (Manual for Developing Countries)

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Abstract

A medical record is a system that aims to track health and hospital visits. It can also be used to assist doctors and nurses in understanding medical history and to assist medical personnel in making decisions about treating patients. The method used in this research is the normative juridical research method. The specifics of this research is descriptive-analytical research, which is research that seeks to analyze legal issues and the legal system, in order to better understand them so that conclusions can be drawn. Medical records are part of the obligations of all doctors and dentists to carry out their medical practice. This is in accordance with "Article 46 of Law number 29 of 2004 concerning Medical Practice. As the executor of article 46 of law number 29 of 2004 concerning medical practice, the Minister of Health Regulation number 24 of 2022 concerning Medical Records was enacted as a substitute for the previous regulation, namely Regulation of the Minister of Health number 269/MENKES/PER/2008 concerning Medical Records". This research provides an understanding of electronic medical record regulations and the development of the implementation of EMR (Electronic Medical Record). In the implementation of EMR (Electronic Medical Record) it is necessary to revamp the EMR (Electronic Medical Record) system as a whole so that an effective and efficient implementation of EMR (Electronic Medical Record) can be created.

Keywords: Electronic medical records, harmonization, electronic health records.

1. Introduction

Electronic medical record systems (EMR) are not only developing in developed countries but also in developing countries to increase effectiveness and efficiency in service Health for the Community. Even though developing countries remain focused on addressing communicable and infectious disease problems, it is important to have practical and appropriate healthcare records use (Pratama et al., 2016). Although there are no specific regulations for collaborating electronic medical records (EMR) in Indonesia, there is support from the 2008 ITE Law and Minister of Health Regulation 24 of 2022 which regulates the legality of electronic medical records (EMR) to become legal information that gives positive hope for collaborating electronic medical record (EMR) in Indonesia. A medical record is a system that aims to track health and hospital visits. It can also be used to assist doctors and nurses in understanding medical history and to assist medical personnel in making decisions about treating patients. Some parts of the hospital that require medical records include the Emergency Unit, Outpatient Unit, and Unit Inpatient (Aditama, 2002).

Medical records are an urgent step in hospital-related information system service medicine and health. Archiving medical records can be done manually or digitally. In medical record management, a legal perspective must be considered so that clarity and legal protection are guaranteed for all parties participating in the assistance service medicine and health in hospitals, both medical records are carried out manually or electronically. But in Indonesia, there is no plan set strategy related to the development of electronic medical records.

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Before developing electronic medical records, it is necessary to conduct an assessment of the readiness of the hospital system. The use of sophisticated information technology minimally provides a sustainable competitive advantage if not arranged and has a good strategy (JH, 2005). To achieve competitive goals, the process of analyzing hospital organizational readiness can be followed by analyzing the strategy for developing electronic medical records. In an effort to face the challenges of developing electronic medical records in Indonesia, researchers are encouraged to conduct research with the title: "Review of Electronic Medical Records in Indonesia and its Development Based on Legal Regulations in Indonesia with Harmonize with Electronic Health Records (Manual for Developing Countries)".

2. Research Method

The research method used is a normative juridical method. The normative legal approach is carried out by examining library materials or secondary data in legal research (Benuf & Azhar, 2020). The specification of this research is descriptive-analytical research, Where This research seeks to analyze legal issues and the legal system in order to understand them better and draw conclusions. The main legal sources used in this study include "Law No. 29 of 2004 concerning Medical Practice, Law no. 36 of 2009 concerning Health, Law no. 11 of 2008 concerning Information and Electronic Transactions, Regulation of the Minister of Health Number 269 of 2008 concerning Medical Records, and Regulation of the Minister of Health Number 24 of 2022 concerning Medical Records"(Otarina et al., 2017). Secondary legal sources are used to describe the primary legal sources and include various types of references, such as books, literature, articles, papers, and writings related to electronic medical records. Tertiary legal sources are legal references used to help explain primary legal materials and secondary legal materials, such as legal dictionaries, legal journals, and various other references. The method of collecting data in this study is based on the use of secondary data, which is obtained through literature studies, document studies, and legal issues that have been recorded.

3. Results and Discussions

3.1. Readiness of Electronic Medical Record Legal Arrangements in Indonesia for Health Service Facilities

Medical records are part of the obligations of all doctors and dentists in carrying out their medical practice (Indonesia, 2004). Article 46 of Law Number 29 of 2004 concerning Medical Practice makes it clear that medical records are part of the obligations of doctors and dentists in carrying out medical practices. Permenkes Number 24 of 2022 replaces Minister of Health Regulation Number 269 of 2008 and provides clear arrangements regarding obligations, types, and contents of medical records, implementation mechanisms, confidentiality, and benefits in health care facilities (Yunisca et al., 2022)

Conventional medical records are records of a person's health written on paper. Sometimes, information about the patient may be added later, and the patient or family must sign the record. An electronic medical record (EMR) is a record of information about a person's health that is stored in an electronic device. This information can be used to aid legal purposes, such as proving that a person has been treated for an illness. Electronic Health Record (EHR) is a digital system that stores complete and organized patient health information. The EHR is designed to replace paper-based health records and make it easier to access, share, and manage patient health information between different healthcare providers.

Government Number 10 of 1966 concerning the Obligation to Keep Medical Secrets requires every health practitioner to maintain medical confidentiality, including medical records. The Ministerial Decree issued in 1972 stipulated the obligation to maintain medical records, aimed at ensuring the proper implementation of medical records in healthcare institutions, including hospitals.

The doctor and the medical team have a legal obligation to make a medical record report. The recording must be based on medical records including systematic information that records identity, diagnosis, therapy, risks, and other information related to health science concepts and law. However, many medical records are not prepared properly so this can cause problems. One of the main disadvantages of medical records is that they are difficult to read.

Apart from causing it to happen inefficiency in health services, can also be fatal. For example, if medical personnel give the wrong drug to a patient, this can be recorded in the electronic medical record. This can be a health problem and can even cause death. Based on Article 1 points 1, 3, and 5 of Law Number 11 of 2008 concerning Electronic Information and Transactions, electronic medical records can be interpreted as electronic data records that are recorded, forwarded, sent, received, or stored in various forms through electronic systems (Nomor, 11 C.E.).

The electronic medical record system is expected to benefit patients and the healthcare provider team. In addition to the general benefits of medical records, the use of information and electronic technology in accordance with Article 4 of Law Number 11 of 2008 concerning Information and Electronic Transactions includes the use of the system "paperless" which is more environmentally friendly. However, the drawback of this procedure is that it is expensive. Some hospitals may not be able to utilize all the benefits of this system and have difficulty managing the security and confidentiality of information in the event of a system failure.

3.2. Development of Indonesian Electronic Medical Records

Although not evenly distributed throughout Indonesia, the use of electronic medical records (EMR) continues to grow in line with the growth of information technology and the need for a more efficient health information system. Laws and regulations such as "Law Number 36 of 2009 concerning Health, Law Number 29 of 2004 concerning Medical Practice, Law Number 11 of 2008 concerning Information and Electronic Transactions, and Permenkes Number 24 of 2022 concerning Medical Records have regulated the use of EMR in Indonesia.

However, there are several obstacles that must be resolved in implementing electronic medical records (EMR) in Indonesia, such as technical standard issues, information security issues, and interoperability issues between electronic medical record (EMR) systems (Salim et al., 2022). Therefore, there is a need for harmonization between laws and regulations in Indonesia and Electronic Health Records (EHR) to ensure that the electronic medical record (EMR) implemented in Indonesia meets international standards and ensures the security and privacy of patient health information.

Thus, the application of an appropriate electronic medical record (EMR) will benefit health services and simplify the process of health services. Harmonization with Electronic Health Records (EHR) will help ensure that the electronic medical record (EMR) implemented in Indonesia meets international standards and ensures the security and privacy of patient health information (Sudirahayu & Harjoko, 2016).

The electronic medical record is a health information system that enables doctors, nurses, and other health professionals to record, store and manipulate patient health information electronically (Faida & Ali, 2021). In this case, patient data can be accessed in an easy and fast way, thus facilitating the process of diagnosis and treatment.

The use of electronic medical records in Indonesia is still relatively new, although several hospitals and clinics have implemented it. Medical record technology continues to develop, and currently there is digital-based medical record technology used in health services. Although electronic medical record technology has been used for a long time in several Southeast Asian countries, there are still few health facilities in Indonesia that apply it.

3.3. Harmonization of electronic medical record arrangements in Indonesia with electronic health records (manual developing countries)

Harmonization of electronic medical record arrangements in Indonesia with electronic Health Records (EHR) is a process to ensure that the arrangements and standards used for electronic medical records in Indonesia comply with international standards for electronic Health Records (EHR). This is important so that health data can be widely accepted and used by health professionals and service health, and to ensure that data collected and stored can be accessed and used effectively and efficiently. However, there are some challenges in implementing electronic health records namely (Kumar & Mostafa, 2020):

- a) Inadequate inclusion of clinical data and standardized terminology
- b) Lack of computer technology
- c) Willingness to change healthcare providers
- d) Limitations of electronic system funding
- e) Concern about the availability of information
- f) Concerns of health workers, patients, and the general public about the quality and confidentiality of information generated electronically
- g) The quality of electronic health information and the accuracy of data input
- h) Lack of human resources with adequate knowledge of the classification of disease systems
- i) Lack of human resources with adequate skills

- j) Problem supplying electricity and the quality of space needed for computers
- k) Involvement of physicians and hospital administrators.

In Indonesia, there are many challenges in developing information systems in hospitals. One of the biggest challenges is the enormous cost. In other sectors, this expenditure could triple. The second factor is that there are still many people who are not sure whether electronic medical records are legal. This correlation regarding encryption technologies and various biometric markers such as fingerprints and retina scanning is an effort in ensuring that the data stored is safe and private.

To assist developing countries in achieving regulatory harmonization of Electronic Health Records (EHR), there are several things that must be implemented including (Omotosho et al., 2019):

- a) Ensure compatibility between systems: Electronic Health Records (EHR) systems must be able to work together and communicate with each other to ensure that data can be received and used effectively and efficiently.
- b) Ensuring data security: Health data security is very important and should be placed as a top priority in the harmonization process.
- c) Ensuring data accessibility: Health data must be accessible to health services that need it and must be protected by applicable law.
- d) Provide Training and Technical Assistance Government: need to provide training and technical assistance to health workers and other professionals who will use electronic medical record systems. This will ensure that the system is used properly and efficiently.
- e) Developing Technology Infrastructure: this needs to be developed to ensure that the electronic medical record system can function properly and can be accessed by health workers and other professionals. This could include increasing internet access, increasing networks, and increasing data storage capacity

3.4. Readiness for the Development of Electronic Medical Records (EMR) in Indonesia

To use an effective electronic medical record (EMR), an analysis process must be carried out beforehand to determine whether it is ready to implement it. This process, called readiness analysis, can help in knowing what needs to be done and how much work is still needed. Setting a road map and the sustainability of the electronic medical record elaboration program in Indonesia requires a review of the availability qualifications of human resources, culture, and infrastructure (Masyfufah & Uktutias, n.d.)

3.5. Human Resources

The development of electronic medical records (EMR) will depend on the availability of human resources (such as doctors) and policymakers. An electronic medical record (EMR) is an automated system that stores important information about patients, including identification, medication, prescriptions, and laboratory results. Careful planning is required regarding the availability of human resources and their ability to operate an electronic medical record system (EMR). This plan must be documented and proposed to the personnel department so that the required human resources can be available. The competence of health workers in processing computers is also important in supporting the development of electronic medical records (EMR).

Even though information technology and electronic medical records are developing rapidly, the shortage of competent human resources in the field of information and technology is currently a topic of discussion that needs serious attention. It requires an organization consisting of several experts in the field of information technology such as programmers, interface designers, network administrators, and technicians to manage and maintain information technology infrastructure. The organization should have at least four sections, namely a secretary section, a network section, a communications section, and an information systems section. This organization must be led by a chief information officer (CIOs). The organizational structure of human resources in the implementation of electronic medical records (EMR) involves various roles that work together to manage and ensure the success of the system. Following are the organizational structure qualifications for EMR implementation:

- a) Executive Director/CEO: Responsible for the organization's overall vision, mission and strategy for implementing EMR. They must have strong leadership skills, experience in managing organizations, and an understanding of health information technology (Health Information Technology).

- b) Chief Information Officer (CIO): Manages information technology strategy, resources, and policies related to EMR. They must have a strong background in information technology, experience in the healthcare industry, and the ability to manage technical teams.
- c) EMR Project Manager: Coordinates and oversees the implementation of the EMR system, including planning, implementation, and evaluation. They must have experience in project management, knowledge of EMR, and the ability to work with a variety of stakeholders.
- d) Medical Record Specialist: Performs data entry, coding, and document management in the EMR system. They should have experience in medical records management and the ability to use a specific EMR system.
- e) Clinical Analysis: Collect and analyze data from the EMR system to support clinical decision-making and quality evaluation. They must have a background in data analysis, knowledge of healthcare, and the ability to work with clinical data.
- f) IT Technician: Supports implementation and maintenance of EMR systems, including installation, configuration, and troubleshooting. They should have experience in technical support and knowledge of specific EMR systems.
- g) Staff Training: Develops and delivers training programs for users of the EMR system, including doctors, nurses, and administrative staff. They should have experience in teaching or training and knowledge of specific EMR systems.

To ensure the successful implementation of EMR, it is very important for organizations to have the right human resource structure and the required qualifications for each role.

3.6. Working culture

Culture greatly influences how people behave, and what they expect from technology. This is why it is important to develop an electronic medical record (EMR) system. The key to the successful implementation of electronic medical records (EMR) does not only depend on the system being built, but also on the extent to which the system meets user needs. Doctors and nurses recognize that they play an important role as users of the system and provide valuable input in the process of designing and planning the implementation of electronic medical records (EMR). The development of an electronic medical record (EMR) not only requires user and management involvement but also involves patients in the process of evaluating the services provided and the readiness of the electronic medical record (EMR) process workflow. The evaluation includes clinical administration mechanisms and necessary patient and staff descriptions. However, it should be noted that the description of staff requirements for implementing electronic medical records (EMR) still needs to be developed. In addition, policies, procedures and protocols are also important to consider in the process of electronic medical records (EMR).

One of the challenges in using EHR hereinafter referred to as Electronic Health Record is that sometimes the data in the system is not in line with what actually happens in the hospital. Successful use of the system Electronic Health Records (EHR) relies on standards set by healthcare institutions.

3.7. Infrastructure Technology

Adoption of Electronic Health Records (EHR) in full requires a large budget and goes through a long mechanism, so it is necessary to prepare adequate information technology infrastructure and budget. However, hospitals are often limited in the budget for information technology, so finance is an important concern. Hospitals are required to provide technology and information infrastructure such as computers, wired or wireless networks, electrical systems, security, consultants, and training to ensure the successful development of electronic medical records (EMR) (Handiwidjojo, 2015)

The infrastructure created to implement electronic medical records (EMR) must meet the needs for privacy and security, as well as health insurance and accountability. Some of these needs, such as creating a security team, calculating risks, making policies and SOPs, and implementing controls, can be done in advance. However, it is necessary to remember the application itself will not run if there is no user involved in its planning. With this, users can determine how the application makes life easier, and not harder.

3.8. Legal Aspects of Medical Records Electronic

The legal aspect of electronic medical records is an important part that deserves special attention. Because it is related to personal data and patient health. As a form of a medical document, electronic medical records must comply with applicable legal requirements, such as the right to privacy, confidentiality, accuracy, and data security. In Law no. 36

of 2009 concerning Health, Article 72 paragraph (1) states that "every health worker and party carrying out health actions is obliged to make a medical record for every patient they handle". Furthermore, Article 75 paragraph (1) states that "medical records must contain complete data and information about the patient's health condition obtained through examination, assessment, diagnosis, action, and treatment" (Indonesia, 2009).

In terms of electronic medical records, Law no. 11 of 2008 concerning Information and Electronic Transactions (ITE) is the main reference. Article 27 paragraph (1) of the ITE Law states that "everyone is prohibited from misusing electronic information intentionally and without rights or violating the personal interests of others" (Sujamawardi, 2018). Where as Article 28 paragraph (1) states that "everyone is prohibited from accessing other people's electronic systems intentionally and without rights".

In addition, the Ministry of Health also issued Permenkes No. 24 of 2022 concerning Medical Records. This regulation describes the technical and administrative requirements that must be met by an electronic medical record system, such as data security, access rights, data backup, and others.

In line with the doctor's duties in documenting the patient's medical history in a certain way, this can be done by writing it yourself, or by recording it electronically.

Implementation of conventional medical records towards electronic medical records.

The implementation of conventional medical records towards electronic medical records is a process that aims to improve the quality of health services. Conventional medical records include medical documents that are written manually and stored in physical forms such as paper or patient cards. However, electronic medical records utilize information technology to record, store, and manage medical information. Implementation of electronic medical records will provide significant benefits in terms of data accuracy and security, efficiency and productivity, and better service to patients.

First, the implementation of electronic medical records can improve data accuracy and security. By using an electronic medical record system, patient information can be easily accessed and shared securely. This allows doctors and medical teams to have access to all patient medical information and minimizes the risk of errors or duplication of data. Electronic medical record systems can also encrypt medical information to increase data security and prevent unauthorized access.

Second, the implementation of electronic medical records can increase efficiency and productivity. With an electronic medical record system, doctors and medical teams can access patient medical information online real time and easily. This allows doctors to make quicker decisions and provide more effective care to patients. The electronic medical record system can also automate administration processes such as scheduling appointments and managing drug stock.

Third, the implementation of electronic medical records can provide better service to patients. With an electronic medical record system, patients can easily access their medical information through an online portal or mobile application. This allows patients to better understand their health conditions and make better decisions about their care. In addition, the electronic medical record system can also send notifications or reminders to patients about doctor's appointments or other treatments that must be performed. Overall, the implementation of electronic medical records is an important effort in improving the quality of health services. Electronic medical record systems can improve data accuracy and security, efficiency, and productivity, as well as provide better service to patients. Therefore, all related parties, such as the government, hospitals, doctors, and patients, must work together to encourage and facilitate the implementation of electronic medical records.

When considering moving from a manual medical record system to an electronic medical record, there are a number of things to consider (*Electronic Medical Records: Benefits, Challenges, and Implementation*, 2020):

- a) Selection of the EMR system that suits your needs.
- b) Development of an EMR system that is integrated with other systems such as lab systems, pharmaceutical systems, and hospital management information systems.
- c) Training for medical personnel and staff to use the EMR system.
- d) System evaluation and maintenance of EMR regularly.

Apart from that, in moving the medical record system, the executive committee also needs to analyze the meaning of an electronic health record system, so it must determine the number of initial steps (WHO, 2006):

First, They need to have knowledge of the systems operating in some developing countries and any restrictions that may impact the implementation of Electronic Health Records (EHR), similar as a lack of budget, weak technical support, an incapable source of electricity dependable, as well as limited staff who do not yet have competence. The next step is to review the existing medical record system by assessing the quality of the current medical record service, identifying problems, and preparing a formal report summarizing the results.

3.9. Manual Medical Record Information Flow

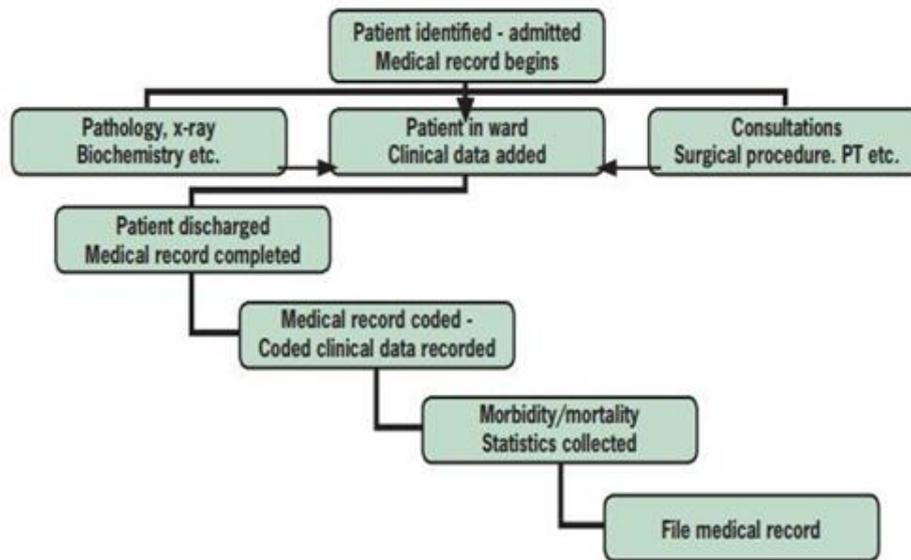


Figure 1. Manual Medical Record Information Flow

The information flow of electronic health records for inpatients must follow the same procedures as manual medical record processes. The process begins with patient acceptance through registration and identification verification. After that, all treatment data is input electronically near the patient's bed or nurse's station via a terminal or other electronic device with the help of the health team. Other data including pathology, biochemistry, and radiology results will be added to patient records electronically from other departments. Thus, when a patient leaves or dies an electronic examination of the results will be carried out for completeness of the data. Diseases and procedures will be coded and statistics will be compiled. Using Electronic Health Records (EHR) should aim to increase the efficiency of health services from institutions and/or countries. In addition, in replacing the use of paper medical records, it is mandatory to ensure the confidentiality of information and data, improve the effectiveness and quality of treatment, and make efforts to promote the health and welfare of the population (Mon, 2004).

3.10. Electronic Medical Record Data Security

The security of electronic medical record data is very important because it involves patients' personal information which must be protected in accordance with applicable laws and regulations. Utilization of computer technology in the creation and delivery of medical information can speed up and extend the accessibility of medical information to ensure accurate medical treatment. However, on the side On the other hand, this can also raise new problems in terms of privacy and patient confidentiality. If the patient's medical data falls into the wrong hands, this can lead to legal problems and the responsibility must be borne by the doctor or hospital. Thus, the standards that apply in the manufacture and storage of medical records in physical form must also be applied to electronic medical records. Even though it uses computer technology to process medical records, it still requires several physical documents such as patient identification, consultation results, and radiology results that must be printed as a form. backup. So, even though computerization can reduce paper use, it still requires paper under certain conditions and circumstances.

For this reason, electronic medical records must implement a system that can reduce the possibility of leakage of patients' personal information.

Here are some steps that can be taken (U.S. Department of Health & Human Services, 2021):

- a) **Data Encryption:** Encryption is the process of securing data by converting information into a form that unauthorized persons cannot read. Encryption can be used to secure EMR data so that only authorized persons can read the information.
- b) **Authentication and Authentication:** Authentication is the process of verifying the identity of a user while authentication is the process of verifying that the information received is correct. Both of these processes can be used to ensure that only authorized persons have access to EMR information.
- c) **Access Control:** Access control is the process of limiting user access to EMR data. Users can only access information that is relevant to their task, reducing the risk of unauthorized access.
- d) **Data Backup:** Data backup is the process of creating a copy of the EMR data that can be used if the original data is lost or corrupted. This ensures that patient information is not lost and remains available.

Audit Trail: The audit trail is the process of monitoring user activity in the EMR system. This helps identify unauthorized activity and ensures that only authorized people can access the information.

4. Conclusion

This writing provides an understanding of electronic medical record regulations and the development of the implementation of electronic medical records (EMR). In the implementation of electronic medical records (EMR), there are several rules governing electronic medical records (EMR) such as Law Number 29 of 2004 concerning Medical Practice and Permenkes Number 24 of 2022 which regulates obligations, types, and contents of medical records, mechanisms implementation, confidentiality, and benefits in health service facilities. However, the government has not regulated in detail the implementation of electronic medical records (EMR) so specific rules are needed to regulate the implementation of electronic medical records (EMR). Factors that contribute to the successful implementation of electronic medical records (EMR) such as human resource support, finance, training, and technical support. There is also harmonization of Indonesia's electronic medical record (EMR) arrangements with electronic health records (manual developing countries) seen from the aspect of the challenge of implementing electronic medical records (EMR) there are several challenges, namely: Insufficient clinical data entry and standard terminology, lack of computer technology, willingness to change health service providers, limited funding of electronic systems, etc. So it is necessary to improve technology infrastructure such as paying attention to data security and budget so that an efficient EMR implementation can be created.

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