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# THE ROLE OF ELECTRONIC MEDICAL RECORDS IN THE HOSPITAL MANAGEMENT INFORMATION SYSTEM AT THE CUT NYAK DHIEN MEULABOH REGIONAL GENERAL HOSPITAL

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**Abstract**

Medical Record is a file that contains notes and documents about patient identity, examination, treatment and other actions for patients while getting care at the service provider to patients both inpatient and outpatient. RME implementation is a process and a big project of the information technology system because it is full of challenges. Because of the importance of RME, this study wanted to find out the extent of the role of electronic medical records on management information systems. This study uses a qualitative descriptive method in which one of the types of research that reveals events or facts, circumstances, phenomena, variables and circumstances that occur at the time of the research took place by presenting what actually happened. The results of the study are as follows: RME has been applied in relation to content, curation, format, and ease of use of RME. Content: allows more complete filling, especially social data and more systematic. Accuracy: the patient's examination becomes more accurate or in accordance with the previous medical history because the patient's data is well recorded and not easily lost. Format: RME format is in accordance with the medical record format for primary health services. Ease: RME is very easy to use, especially the ease of finding data and patient history so that it saves time, is more effective, patient data is stored properly and is not easily lost. The role of the Management Information System Hospital is an activity of computerizing the contents of the health record and the electronization process that produces a system specifically designed to support users with various facilities for the completeness and accuracy of the data. From an important aspect of RME planning is the realization of strategic planning, system planning and analysis of technical planning, and comprehensive planning for each related part. From the aspect of control is a continuous monitor, not just periodic reporting, the periodic RME report made in various categories will be very useful for monitoring and controlling services, medicines, medical devices which will eventually lead to service satisfaction. Whereas from the decision-making aspect, the RME will provide an important database for management decisions, doctors, nurses, and officers who are related both in the effort to develop and appropriate measures in the effort to manage patients to ensure that there is no risk

**Keywords:** Electronic Medical Record, Management Information System


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## INTRODUCTION

A hospital is a health facility and a place for carrying out health efforts, as well as an organization with an open system and always interacting with its environment to achieve a dynamic balance and has the main function of providing health services to the community. The higher a community's level of intelligence and socio-economics, the better their knowledge of disease, costs, administration and healing efforts. The community will demand the provision of quality health services. Good and quality health services cannot be separated from the role of medical and non-medical personnel (RI Law Number 44 of 2009 concerning Hospitals).

Data management in hospitals is one of the important components in realizing an information system in hospitals. Manual data management has many weaknesses, apart from taking a long time, its accuracy is also less acceptable, because the possibility of errors is very large. Current information technology, manual data management work can be replaced with an information system using computers. Apart from being faster and easier, data management also becomes more accurate. When processed, accurate data will produce accurate information. Accurate information is very useful for making decisions, both for management and others.

Medical records are files that contain notes and documents regarding patient identity, examination, treatment and other actions and services provided to patients while receiving treatment at health service providers, both outpatient and inpatient. Medical records contain data from the patient service process starting from the patient's initial registration, medical treatment (while the patient is receiving treatment) to the handling of the medical file itself. Medical records are very personal data and are important information that must accompany a patient when undergoing health services. Ownership of such information is in a patient's basic interests and may not be confidential by the patient to any health care provider. However, this data is confidential to other people who are not entitled to it. The form of medical record that we commonly encounter is in the form of a paper file along with document attachments that are not simple. Along with the development of information and communication technology (ICT) which has had a major influence on changes in all fields, including the health sector, especially in the medical record process called Electronic Medical Records.

Electronic Medical Records have been used in various hospitals around the world as a replacement or complement to paper health records. In Indonesia it is known as Electronic Medical Records (RME). Since the development of e-Health,

RME is the information center in the hospital information system. RME has begun to be used in several hospitals in Indonesia, especially hospitals with foreign investment (PMA), however, health workers and health service facility managers are still hesitant to use it because there are no legal regulations that specifically regulate its use.

Since the issuance of the Information and Electronic Transactions Law (UU ITE) Number 11 of 2008, it has provided answers to existing doubts. The ITE Law has provided an opportunity for the implementation of RME.

Basically, RME is the use of electronic methods for collecting, storing, processing and accessing patient medical records in hospitals which have been stored in a multimedia database management system that collects various sources of medical data. The problem that often arises is that there is no link between each health service provider regarding the information in the medical record. In fact, patients can have health checks at different health service providers at any given time. If there is no linkage between individual health care providers, the same examination will occur over and over again. Even though previous medical record data is very useful in subsequent health examinations. This greatly helps reduce the possibility of misdiagnosis. Apart from that, what happens is that patients only need these medical records at

certain times, for example in emergency situations where the patient cannot hand them over directly at that time. It is not known exactly when this emergency will occur.

A problem that also often arises is the patient's complaint that every time they enter a health service provider they say they answer the same questions at every visit or diagnosis. Patients complain that the questions asked by doctors at the time of diagnosis are almost the same. What this means is, for example, a patient who gets a referral from a hospital to a hospital that has more adequate facilities, previously at the patient's home hospital the complaints and illness they were suffering from were diagnosed, but at the referral hospital the patient was re-diagnosed all over again. This causes the accumulation of the same data about diagnoses and medical records over and over again. Based on the problems mentioned above, it is necessary to design a centralized electronic medical record system that accommodates a patient's medical records in a centralized database. Centralized storage (centralization) referred to here is a situation where outpatient, inpatient and emergency care medical records are stored in one file and in one storage database. So if at any time a patient who has been registered in this system is referred from one hospital to another hospital in one region, the data can be seen and accessed in the database of the hospital or health service provider that has joined this system. The administration process will be faster because a patient's health history has been recorded centrally. If, when checking the database, a patient has previously suffered from the same disease, all that remains is to take the previous data and carry out a further treatment process without making a diagnosis from the start.

Implementing RME is a process and a large project for an information technology system because it is full of challenges. Managers are not always able to accept challenges and organize effectively and critically in order to make changes to new information systems and technology. Ultimately, new electronic information technology is expected to increase privacy and confidentiality. Cut Nyak Dhien Meulaboh Hospital, as one of the hospitals that provides services, definitely has records of interactions with patients. Notes of the interaction between the service provider and the patient are recorded in the medical record. Every month, the Medical Records Unit records the completeness of medical records in both outpatient and inpatient settings.

Recording patient health data and medical record history is an important thing in the medical world, known as medical record data. The patient's medical record data can be used as a reference for subsequent patient health examinations, as well as recorded evidence regarding the diagnosis of the patient's disease and the medical services received by the patient. The medical record recording system used so far still has weaknesses. Because patient medical record data is only stored locally at the place where the patient is undergoing medical examination and treatment and between places it is not possible to exchange data directly. Patients who undergo medical examinations and treatment at several medical institutions, each medical institution will store different medical record data and each medical institution does not have data on the patient's medical history before undergoing a health examination at that medical institution.

A Health Information System means that we have to process data into information that can later be used to organize activities. Medical records are files that contain notes and documents regarding patient identity, examinations, treatment, procedures and other services provided to patients at health service facilities (Minister of Health Regulation No. 749a 1989). The function or purpose of medical records is: to support the achievement of orderly administration in the context of efforts to improve health services. Without the support of a good and correct medical record management system, orderly administration will not be successful. Compared to other management systems, a hospital's management information system occupies

a very strategic position. This system must be able to contribute to all hospital management activities. A hospital's management information system does not only serve statistical data needs but must directly be able to produce information that is useful for the medical decision-making process. Hospital management information system services must be designed individually. Every patient who is a representative of the community using hospital services must receive special "attention" from this system. Each person must receive individual treatment. Two patients who have been diagnosed with the same health problem must be treated specifically and differently from each other. Depends on each individual's medical history.

In the medical field, medical records are written evidence of the service process provided by a doctor or dentist. The medical record contains the patient's clinical data during the diagnosis and treatment process. Therefore, every medical service activity must have a complete and accurate medical record for each patient and every doctor and dentist must fill in the medical record correctly, completely and on time. With the development of evidence-based medicine where data-based medical services are very necessary, quality medical service data and information are integrated properly and correctly, the main source is clinical data from medical records. Clinical data sourced from medical records is increasingly important with the development of electronic medical records, where each data entry directly becomes input from the health information system/management. Health information management at the Cut Nyak Dhien Meulaboh Regional General Hospital is a source of health service information by describing the nature of data, its structure and translating it into various forms of information for the advancement of health and health services for individuals, patients and the community. The person responsible for health information management is obliged to collect, integrate and analyze primary and secondary health service data, disseminate information, organize information sources for the purposes of research, education, planning and evaluating health services in a comprehensive and integrated manner. In order for data in medical records to fulfill requests for information, universal standards are needed which include: a. Structure and contents of medical records, b. Uniformity in the use of symbols, signs, terms, abbreviations and ICD. c. data confidentiality and security.

Based on the author's experience, medical records are closely related to health information management because the data in medical records can be used as a communication tool (information) and a basis for treatment for doctors, dentists in providing medical services, input for compiling disease epidemiology and demographic reports (data patient social) as well as hospital management information systems, input for calculating service costs, material for health statistics, as material/education and data research.

The Cut Nyak Dhien Meulaboh Regional General Hospital has so far used a manual system in searching for patient data or searching for materials in making research, thus with the existence of the Electronic Medical Record the author wants to know the extent of the benefits or role of the electronic Medical Record in the Management Information System in Hospitals. Cut Nyak Dhien Meulaboh Regional General in searching for this data.

## MATERIAL AND METHODS

Data Analysis Techniques are a method or way to process data into information so that the characteristics of the data are easy to understand and also useful for finding solutions to problems, especially problems related to research. Or data analysis can also be interpreted as activities carried out to change the data resulting from research into information that can later be used to draw conclusions.

The purpose of data analysis is to describe data so that it can be understood, and also to make conclusions or draw conclusions about population characteristics based on data obtained from samples, which are usually made on the basis of estimation and hypothesis testing.

## RESULTS

### 3.1. Electronic Medical Record Flow

Electronic Medical Record Steps:

- Medical record books are delivered to each polyclinic by medical records officers.
- The medical record book has arrived at the polyclinic and is being held by the paramedic team which is then used to take anamnesis of the patient.
- After completing the patient history, the patient and medical record book are taken to the Medical Team (Doctor) for examination.
- After completing the examination, the doctor gives the patient a diagnosis.
- After that the doctor inputs the Electronic Medical Record data

### 3.2. Benefits of Electronic Medical Records at the Cut Nyak Dhien Meulaboh Regional General Hospital

From the results of interviews we conducted with informants on July 18 2018, users of electronic medical records have the potential to provide great benefits for health services such as basic service facilities and referrals (hospitals). One of the benefits felt after using electronic medical records is increasing the availability of electronic records for hospital patients. This is also beneficial for patients because it increases efficiency in the health care process. Apart from that, for administrative staff, the use of electronic medical records can make it easier to retrieve patient information. So that health workers can easily access patient information. Doctors and health workers also benefit from providing health services due to the ease of accessing patient information which ultimately helps in making clinical decisions such as establishing a diagnosis, administering therapy, avoiding allergic reactions and duplication of medication. From the aspect of efficiency, the use of electronic medical records has the impact of reducing operational costs and increasing income in health service facilities, especially hospitals.

Realizing the implementation of electronic medical records requires a process of migrating paper medical records to electronic medical records with a series of processes starting with the introduction of electronic medical records and their benefits. Motivation for users is very necessary so that they understand the importance of using the system and always use the system in patient service activities. Motivation takes the form of an explanation of the benefits of the system, the consequences of not implementing the system so that users think the system is a necessity. Management support is absolutely necessary in terms of meeting the needs for implementing electronic medical records and being able to formulate policies related to implementing electronic medical records. Considering the various advantages including cost and benefits factors from implementing RME at the Cut Nyak Dhien Meulaboh Regional General Hospital (health service center), the author sees that there are at most three benefits that can be

obtained, each of which is:

- General Benefits, RME will increase the professionalism and performance of hospital management. Stakeholders such as patients will enjoy the ease, speed and comfort of health services. For doctors, RME allows the implementation of good and correct medical practice standards. hospital managers, RME helps produce auditable and accountable documentation so as to support coordination between departments within the hospital. Apart from that, RME ensures that each unit will work according to its function, responsibility and authority.
- The operational benefits of implementing electronic medical records include at least four operational factors that will be felt. The first factor is the speed of completion of administrative work. When using a manual system, tracing files until they are returned to their proper place will definitely take time, especially if there are quite a lot of patients. This speed has the effect of increasing work effectiveness. The second is the accuracy factor, especially data accuracy. In the past, with a manual system, people had to check files one by one, but now with RME, patient data will be more precise and correct because there is less human intervention. Another thing that can be prevented is the occurrence of data duplication for the same patient. For example, the same patient is registered 2 times at different times, then the system will reject it, RME will provide a warning if the same action for the same patient is recorded 2 times, this ensures that the data is more accurate and the user is more thorough. Third is the efficiency factor, because the speed and accuracy of data increases, the time needed to carry out administrative work is greatly reduced, so employees can focus more on their main work. Fourth is ease of reporting. Reporting work is time-consuming but very important. With RME, the reporting process about a patient's health condition can be presented in just a matter of minutes so that we can concentrate more on analyzing the report.
- Organizational benefits, because SIMRS requires discipline in data entry, both timeliness and correctness of data, the work culture which previously postponed things like that, has changed. Often RME data is also required by other service units. So RME creates increased coordination between units. Often people state that with computerization administrative costs increase. In fact, in the long term the opposite is true, if with a manual system we have to make a report first on paper, then analyze it, then with RME the analysis can only be done on a computer screen, and if it is correct then the data is printed. This is a significant cost savings in the long term

**Table 1. Users' responses to electronic medical records that have been implemented are related to content, accuracy, format and ease of use of electronic medical records**

| | |
|---|---|
| Contents | Using electronic medical records allows for more complete filling, especially social data, and is more systematic. |
| Accuracy | Users assess that by using electronic medical records, patient examinations are more accurate or in accordance with previous health history because patient data is recorded well and is not easily lost. Electronic medical records also avoid confusing patient data. One respondent considered that the electronic medical record did not have the examining doctor's signature and clear name, so its legality was still doubtful. |
| Format | : All respondents were of the opinion that the electronic medical record format was in accordance with the medical record format for primary health care, but according to one respondent, the format was still unable to differentiate medicines based on patient type. |
| Convenience | All respondents were of the opinion that electronic medical records are very easy to use, especially the ease of searching for patient data and history so that it saves time, is more effective, patient data is stored well and is not easily lost, but because it is a new system and still uses paper medical records, the process becomes difficult. longer |

### 3.3. Benefits of Electronic Medical Record Users at Cut Nyak Dhien Hospital, Meulaboh

According to the informants we interviewed, there are several advantages to using the Medical Records Information System at the Cut Nyak Dhien Meulaboh Regional General Hospital:

3.3.1. Ease of inputting patient data

Using a computer to input data is easier compared to manually inputting data

3.3.2. With this program, patient identity data, inpatient and outpatient registration, and patient data. Leaving the inpatient and outpatient rooms can be done easily because you don't need to type in certain data to fill in certain data one by one, you just have to choose the options provided.

3.3.3. Ease of creating reports

Using a computer can also make the process of making medical record reports easier. This program specifically focuses on the process of creating reports for certain time periods, such as weekly, monthly or annually. With an electronic medical record information system, officers can determine the desired report time period.

3.3.4. Data security

The use of the medical record information system is limited to officers only, especially those related to electronic medical records because this system is equipped with a login containing user and password, so that the security of data in the database is more guaranteed. To enter the main page of the system, officers must log in first, so that only officers and administrators can manage this electronic medical record.

3.3.5. Time efficiency

A medical record information system can help save time in making patient medical record reports. Likewise, searching for patient data can be done quickly, so that time to serve patients is more efficient.

RME is the use of information technology devices for collecting, storing, processing and accessing data stored on patient RMs in hospitals in a database management system that collects various sources of medical data. Cut Nyak Dhien Meulaboh Regional General Hospital has combined RME with the Hospital Management Information System (SIMRS) application which is a main application that not only contains RME but has been added with features such as administration, billing, nursing documentation, reporting.

RME can also be interpreted as an application environment composed of clinical data storage, clinical decision support systems, standardization of medical terms, computerized data entry, and medical and pharmaceutical documentation. RME is also useful for paramedics to document, monitor and manage health services provided to patients in hospitals. Legally, the data in RME is a legal record of the services provided to patients. The hospital has the right to store such data. RME is different from Electronic Health Records (RKE). RKE is a collection of patient RMEs in each hospital (health care center). RKE can be accessed and owned by patients and the data can be used at other health service centers for subsequent treatment needs. RKE can only be realized if there is a standardized RME data format in each hospital so that the data can be integrated. To realize RKE, an integrated system is needed that is mutually agreed upon by each health service center in a certain area or even wider than that, for example nationally.
Kegunaan RME dapat dilihat dari beberapa aspek antara lain:

- Administrative aspect: the content concerns actions based on authority & responsibility for health workers.
- Medical aspect: because these records are used as a basis for planning the treatment & care that will be provided.
- Legal aspect: because the content concerns the issue of guaranteeing legal certainty on the basis of justice in efforts to uphold the law as well as evidence to uphold justice.
- Financial aspects: can be used as material for determining payment of health service costs.
- Research aspect: because it contains data or information as an aspect of research & scientific development in the health sector.
- Educational aspect: because it involves information data about the chronological development of medical services for patients that can be studied.

**3.4. Interview Results Regarding Planning, Controlling, Decision Making regarding Electronic Medical Records**

Me : How is the planning system related to Electronic Medical Records?
Resource Person : Basically, every health sector organization will develop a strategic plan that will implement information technology such as Electronic Medical Records (RME) and build its own budget for IT. in no way reduces the importance of RME, but rather places it as an integral feature of the essence of every initiative. The RME project is a long-term project, and is quite expensive. Getting support from senior management is important for the success of RME and is something that cannot be done in a short time.
Me : What is the control system regarding Electronic Medical Records?
Resource person : control is carried out in the medical record information system starting from the outpatient installation (every polyclinic in the outpatient installation)
Me : What is the decision making system regarding Electronic Medical Records?
Resource Person : There are 4 steps to the decision making process

Systematic known as SOAP (Subjective, objective, observation and planning (plan S (Subjective):

Subjective data contains data from the patient through anamnesis (interview) conducted by the doctor on the patient. O (Objective): Objective data data from the results of observations through a physical examination, A (Assessment: Analysis and interpretation based on the data collected and then a conclusion is made which includes a diagnosis, anticipation of a potential diagnosis or problem, as well as whether or not immediate action needs to be taken. P (Plan): Planning is a plan of actions to be provided including care independent, collaborative, diagnostic or laboratory, and further counseling

**CONCLUSION**

The Role of Electronic Medical Records Electronic medical records in the management information system at the Cut Nyak Dhien Meulaboh Regional General Hospital is an activity of computerizing the contents of health records and the electronicization process which produces a system specifically designed to support users with various easy facilities for completeness and accuracy of data, providing alert signs, as warnings, signs for clinical decision support systems and connecting data with medical knowledge and other tools. The role of electronic medical records related to planning, control and decision making:

- Planning: Electronic Medical Records at Cut Nyak Dhien Meulaboh Hospital is an implementation of strategic planning. The Cut Nyak Dhien Meulaboh Regional Hospital's strategy in realizing the organization of a patient database in the form of an Electronic Medical Record (RME) is very helpful for patient service. Even though it is still in the initial stages, in the future, through electronic medical records, doctors will be able to access patient databases via cellphone and/tablet devices that are connected online to the hospital database. Technically operational, the electronic medical record at Cut Nyak Dhien Meulaboh Regional Hospital is always planning system updates so that the RME gets better over time. Because at certain times (and if necessary) RME results can be made into reports in various categories such as reports based on patient data, based on treatment class, based on the disease suffered, the treating doctor, the medicines and medical devices used, and so on. Through this report, it can be used as planning material to improve the quality of service and management of Cut Nyak Dhien Hospital, Meulaboh.
- Control: MIS support in the control process starts from the planning model. The support provided includes the following: analysis that assists in understanding differences. Another support from the management information system in the control process is continuous monitoring, not just periodic reporting. An example of the application of SIM in the control process is the Electronic Medical Record process carried out at Cut Nyak Dhien Hospital, Meulaboh, where the process is continuously controlled by the party responsible for the medical record process. In the process, processing has been regulated by the computer and continues to be controlled according to the program that has been created. Control through Electronic Medical Records will help doctors and nurses to know medical records (patient history records) so that it will make it easier to determine appropriate steps for treating patients. Having a medical record that is neat, complete, clear and easy to understand will provide very important information to determine the level of action for the patient's recovery. Apart from medical analysis and procedures, electronic medical records can also determine the drugs and medical devices used by each patient. Thus, for a certain period the units, types and volumes of drugs and medical devices used can be compiled into a tabular or graphical report. This report will be a

control for medical equipment and medicine units (units) to organize the flow of supplies so that hospitals will not experience a crisis of running out of medical equipment and medicines. This will have an impact on patient services because by always having complete medical equipment and medicines available, patients no longer have to spend money to buy them at pharmacies/drug stores outside the hospital.

- Decision making: The process of choosing between various alternatives is called the decision making process. This managerial function is interwoven between planning and control. Management information system support for decision making in an organization can be described according to three stages of the decision making process, namely: Understanding, Design and Selection of System Support. Information Management usually involves processing computer and non-computer files. Basically, the role of the Management Information System is in the understanding process, which involves research into conditions that require decisions. The RME system provides database support (in the form of electronic medical records) to identify patient problems if risky procedures are to be carried out (eg surgery). RME at Cut Nyak Dhien Meulaboh Regional Hospital is also useful for managerial decision making, especially in the context of strategic hospital development considering that the RSU development strategy requires the availability of a database that is structured, up to date, and easy to access. Decision making based on RME at Cut Nyak Dhien Meulaboh Hospital is technically in the hands of operator officers who actively, carefully and creatively input data. Next, save the original source of the data (in the form of a doctor's manual note) so that it can be accessed easily if necessary. However, on the other hand, officers must also be agile in making decisions if at any time leaders, doctors or stakeholders need digital data. Due to the possibility of problems arising in RME, mainly related to networks, software, organizational bureaucracy, and the condition of the officers themselves, intelligent and accurate operational decision making is very necessary to ensure the sustainability of the RME system. Operational decision making related to patient services, the RME system at Cut Nyak Dhien Meulaboh Hospital can be carried out by every officer in every polyclinic. This is because RME is connected to each service polyclinic so that services are carried out based on a database, making things easier for officers and making things easier for patients. In this case, patient medical records are no longer transferred manually from one officer to another officer at a different location. Because it is database-based, service queue numbers can be ensured and services can run in an orderly and orderly manner.

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