



The Implementation of Electronic Medical Record (EMR) in The Development Health Care System in Indonesia: A Literature Review

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Abstract

The development of information technology is now growing rapidly, including in the health sector. According to WHO, medical record is an important compilation of facts about a patient's life and health. The development of information technology in medical records is the electronic medical record (EMR). Developed countries, such as the United States and Korea have implemented EMR for a long time. In developing countries such as Indonesia, the development of EMR is still in progress because its implementation requires many factors to build a system or replace from manual medical records. Eventually, it is hoped that in the future all health care will use the EMR to resume patient datas from admission to discharge. The purpose of this study is to analyse the implementation and preparation of EMR in health care in Indonesia. This study is a literature review on the implementation and preparation of EMR in health care in Indonesia. The review is dome from 28 literature sources (Google-Scholar database). Total of 8 articles were obtained from 2017 to 2021. The results show that there are benefits after switching to EMR, even though some health care only used EMR in certain units. The highest benefit is reducing the cost of duplicating paper for printing. Also there is still limited human resources and tools for implementing EMR in Indonesia. The implementation of this EMR will enable the improvements of the service quality of the health care itself, especially in Indonesia.

Keywords: *Implementation; EMR; Health care; Indonesia*

Introduction

Medical records are files containing records and documents about patients identity, examination, treatment, other medical measures in health care facilities for outpatient, inpatient both government and private (Regulation of the Minister of Health Number 209 of 2008). According to WHO (2006), medical records are an important compilation of facts about a patient's life and health. PMK 269/2008 Regulation of the Minister of Health Number 269 of 2008 also stated that medical records must be made in writing, or electronically which must be complete and clear. This proves that in the future medical records will be developed

electronically. Electronic Medical Record (EMR) is the development of information and communication technology in the field of health.

EMR has long been applied in developed countries, such as United States, Korea, China, England. In developing countries, EMR is still applied in some countries. Indonesia is a developing country where every health care centre does not implement EMR. Building EMR requires careful planning because its implementation requires involvement of many parties and they must be related and focused on the needs of users (Silvestre, 2018). RME

in developing countries is very necessary to be developed, especially for Indonesia. Based on this statement, this study analyses the implementation and preparations of EMR by health care in Indonesia.

Materials and Methods

This research was a literature review. We searched sources including the Google

Scholar database (from 2017-2021). For downloading the research papers, we decided on search terms "Implementation" AND "Electronic Medical Record" in Indonesia's regions. In the early stages, we obtained 28 articles. These 10 articles are considered relevant. The articles were selected again according to the focus of the research, so finally 8 articles were obtained.

Table 1. Journal Resume

No	Title	Author	Objectives	Methods	Results
1	Evaluation of Medical Record Information System in RSUD Kota Surakarta to Supporting Electronic Medical Record	Nugraheni (2017)	Evaluate the management of medical records in hospital Surakarta using an evaluation model Health Metrics Network (HMN)	Qualitative, interview with 3 respondents (head of medical record, medical record staff, and IT staff)	Inadequate resources, data sources but the indicators SIM RS Pilar Hospital is not yet fully known as EMR
2	Peningkatan Mutu & Efisiensi Pelayanan Melalui Implementasi Rekam Medis Elektronik di RS Bethesda Yogyakarta	Saputro (2018)	To know the improvement of service quality	Observational, comparing before and after implementation of EMR	EMR increase the quality objectives of medical record department, decrease in cost health services
3	Analisis Strategi Pengembangan Rekam Medis Elektronik di Instalasi Rawat Jalan RSUD Kota Yogyakarta	Pratama & Darnoto (2017)	Analyse the development strategies outlined by EMR readiness	Qualitative and quantitative	Yogyakarta General Hospitals though a strong organization but faces many threats to develop EMR
4	Analisis Kesiapan Implementasi Rekam Medis Elektronik dengan Pendekatan DOQ-IT (Doctor's Office Quality-Information Technology)	Faida & Ali (2021)	Analyse the readiness of implementing RME with the DOQ-IT approach at the Surabaya Haj Hospital	Quantitative, 50 respondents	Aspects of human resources, organizational, and infrastructure aspects are as a whole in a ready category
5	Analisis Kebutuhan Electronic Medical Record (EMR) Pasien Rawat Jalan Dewasa Menggunakan Metode User Centered Design (UCD) di RSCM	Novitasari et al (2020)	Analyse the needs of EMR implementation	Observational, interview	There are 3 needs for users and organizations, namely, informational needs, functional needs, and non-functional needs
6	Resistor Factors of Electronic Medical Record Implementation in Yogyakarta City Hospital as a Government-Owned Hospital in 2018	Syahputra & Kurniawan (2018)	To determine the inhibiting factors of the application of electronic medical records with fishbone analysis	Qualitative, interview with medical record officers, nurses and doctors	In terms of manpower, some doctors feel difficult. In methods, there is no continuation in the proposed blueprint and executive team. In

					terms of machine, hospital management information system (HIS) does not support this fully. In terms of materials, the application of HIS is still being developed by third parties
7	Pengembangan Rekam Medis Konvensional Menuju Rekam Medis Elektronik di RS PKU Muhammadiyah Gamping Tahun 2018	Purwanti & Kurniawan (2018)	To know the groove of procedure, planning, development, and implementation of conventional medical records towards electronic medical records in PKU Muhammadiyah Gamping Hospital	Qualitative, observations and interview with medical records officers, staff of IT, doctors, and nurses	The development of EMR is still ongoing and the implementation is 90%
8	Evaluasi Rekam Medis Elektronik Bagian Coding Rawat Inap di RSUD K.R.M.T Wonsonegoro Kota Semarang	Indrawati et al (2020)	Evaluate EMR implementation using the PIECES method (performance, information, economic, control, efficiency, services)	Qualitative, interview	RME has already produced performance, can provide accurate information quality

Results and Discussion

The Implementation of Electronic Medical Record (EMR) in Indonesia's Health Care

Surakarta Government Hospital already has a computer-based medical record information system, hospital management information system (HIS) Pilar Hospital. HIS in Surakarta Government Hospital information related to medical records are registration, inpatient, outpatient, emergency, laboratories, radiology, non-operative, pharmacy, and cashier. Pilar Hospital is desktop-based because it makes use of Microsoft Office, making it easy for all employees. Start page of Pilar Hospital uses security with username and password that must be filled up before entering the application. Officers have their own job description, so not all can fill in every module. Only two persons have access to all modules in HIS, IT and the head of medical records. The IT is responsible for the running of the system, including maintenance. The head of

medical records is also given access because it relates to patient data thoroughly and continuously (Nugraheni, 2017).

Bethesda Yogyakarta Hospital is the oldest educational hospital and private hospital in Yogyakarta. Medical records documentation service in this hospital have not been fully carried out electronically. Eventually, this hospital claimed to have felt many benefits when medical records are electronically preserved. EMR activities are conducted electronically when the doctor writes history, treatment and diagnosis in the EMR module on the computer (Saputro, 2018).

EMR implementation at Government Hospital Dr. Cipto Mangunkusumo is targeted in 2020. Target users of EMR adult outpatients are doctors, nurses, medical recorders and pharmacists. Every user will be facilitated with tablet, stylus pen or computer. Adult outpatient EMR is built with security (username and password) connected databases stored on the

server as a data center. Doctors can access patient profile, patient medical initial assessment, outpatient assessment and planning, integrated patient progress records, consultations, medical action approvals, outpatient and family information and education. Nurses can access integrated patient progress records pages, nursing assessments, of outpatient and family integrated patient and family information and education. The Medical recorders can access the patient's profile, make report of the top 10 outpatient diseases and reports of outpatient visits. Adult outpatient forms are in appropriate with the needs of users. This is because they created forms from every unit, so that the contents of the form correspond to the user. EMR is expected complete patient data can be recalled easily (Novitasari *et al.*, 2020).

The procedures of conventional medical record at PKU Muhammadiyah Gamping Hospital was too long, while EMR has a shorter procedure. In June 2018 they were using two medical records, conventional and electronic. EMR was first used by a neurosurgeon in April 2018. The sectors involved in the development of EMR are management, directors, medical records, doctors, pharmacy, nurses, and IT. The implementation of EMR is carried out gradually. The trial was conducted from one doctor accompanied by conventional medical records near the computer (Purwanti & Kurniawan, 2018).

Preparation of EMR in Indonesia's Health Care

The preparations of EMR include identification of the needs of medical records of the patients including information needs, functional needs and non-functional needs (Novitasari *et al.*, 2020). Things to note in building EMR in the health service include identification of the elements, methods, machine, and materials.

The Advantages of EMR After Its Implementation

Health care that have used EMR partly, already feel some benefits. Saputro (2018) showed that in Bheteseda Hospital Yogyakarta the quality of the target medical records documentation for new patients that arrived at

the clinic take less than 10 minutes and the old patient less than 20 minutes. Medical records documents complaints from nurses. So these EMR are cost savings in hospital due to the savings of paper and decreased storage needs.

The existence of computerized functions improves the effectiveness of the accuracy of input, storage, search, report, coordination between units and data transmission at Islamic Jemursari Hospital. EMR reduces file stacking time and form a centralized data storage. EMR reduces paper usage and save the cost of storage space and paper. The medical record system with RME can perform data retrieval faster, from 5-15 minutes for one patient to 36 seconds to use it (Irawan, 2019).

This is in line with Sudra (2020) that the use of EMR is expected to be able to produce quality documentation in medical records. It can support the need of healthcare for patients and service management and be able to produce information and reports. The EMR are beneficial in terms of efficiency, reliability, and care quality (Janet & Yeracaris, 2020).

Conclusion

The implementation of EMR health care in Indonesia is still not fully used in all parts or units of the health care system. Identification of user, needs to be considered in building EMR, so that it can be constructed easily and interestedly. Although, some health care already feel the benefits of EMR implementation, the most advantageous effect felt by its users is the cost of savings. So, there is need for the development for EMR in health care in Indonesia. Mostly, the health care has been working with third parties in developing EMR. Hopefully health care system can develop their own EMR system in the future, which may help to solved many obstacles quickly.

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Conflicts of Interest

The authors declare no conflict of interest.

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