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IMPROVING PATIENT SAFETY AND HOSPITAL SERVICE QUALITY THROUGH ELECTRONIC MEDICAL RECORD: A SYSTEMATIC REVIEW

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ABSTRACT

Background: *Examines properly implementation of Electronic Medical Records (EMR) which associated with workflows, policies and health services in enhancing patient safety. The electronic medical records have benefit to the patients due to the efficiency in the healthcare process. Therefore, the aim of this study was to examine the literatures on patients safety reporting based on electronic system review and assess the implementation.*
Methods: *Systematic review with Prisma at the literature published between 2010 – 2019 using three large database: Proquest, Oxford Academic Journals, and Scopus. The eligible articles in this review should show an effect of patient' safety, and product quality in hospital in correlation on using EMR. It must include some effect on medication error, prescribing error, error in the use of EMR that potentially endanger patient safety.*
Results:*The most important function of EMR implementation is to improve patient safety in hospital and to reduce the cost. EMR reduce excess cost of Hospital Acquired Condition (HAC) by 16%, reduce death due to HAC by 34%. Doctor and nurses believe that the quality of patient data would be better by using EMR as their daily routines.*
Conclusion: *EMR can improve patient safety due to some skills in technology. Thus, it would not harm to the patients safety. However, the implementation of EMR requires the human skill resources in using technologies, computer and programs.*

Keywords *: electronic medical record, hospital, patient safety, electronic health record*

INTRODUCTION

Hospitals as health centers are required to provide comprehensive services for patients. Patients need health services that guarantee the safety and no errors occur. One of quality assurance services by improving patient safety. Patient safety is a system that makes patient more secure, including risk assessment, identification, risk management, reporting and analysis of incidents, learning ability of incidents and follow-up and implementation of solutions for the answer to the risks and prevention of clarity caused by mistakes due to the action or unnecessary actions [1–6].

Efforts to improve the safety of patients is by using the utilization of electronic medical records in the hospital as a system. Electronic medical records are beneficial to patients because they improve efficiency in the healthcare process. For administrative personnel, the use of electronic medical records can retrieval and access patient information. Doctors and health workers also get the benefit from

providing health services for the convenience of accessing patient information that ultimately helps in improving patient safety and clinical decision making such as diagnosis, therapeutic therapy, allergic reactions and drug duplication. Aspects of efficiency and the use of electronic medical records impact in reducing the operating costs and increased revenues in health care facilities, especially for hospitals [5, 7, 8].

Up The system of incident report is important for collecting and reporting adverse patient occurrences, such as medication errors and equipment failures [9]. Therefore, the electronic data is hoped to help detect, manage, and learn from potential safety events in near real-time. The systems can be programmed to automatically detect easily overlooked and underreported errors of omission, such as patients who are overdue for medication monitoring, patients who lack appropriate surveillance after treatment, and patients who are not provided with follow-up care after receiving abnormal laboratory or radiologic tests results [10].

Electronic health records (EHRs) are promoted due to their capacity to reduce clinicians' workloads, costs and errors. The paper based reporting has many disadvantages, including manual data entry and requiring manual processing. Accordingly, a systematic review on electronic patient record system for patient safety becomes important to be known the extent to which it is implemented. Thus, the purpose of this study was to examine the literatures on patient safety reporting based on electronic system review the finding systematically, and assess the implementation of this measurement [11].

METHODS

We conducted a systematic review with PRISMA at the literature published between 2010 – 2019 using three large database: Pro-Quest, Oxford Academic Journals, and Scopus. Each step is summarized below.

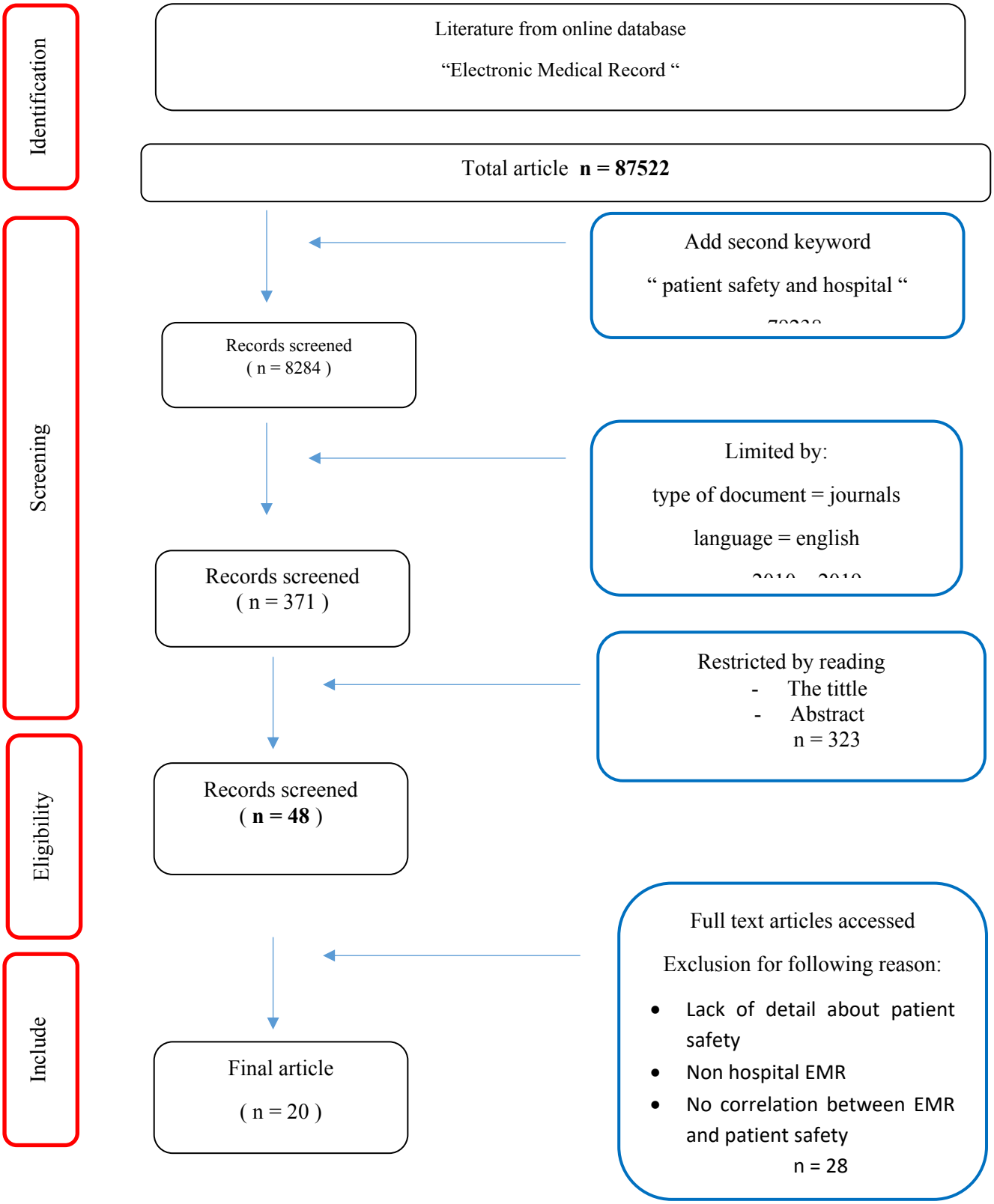
Information search and ilegibility criteria

Using three large database, we search for articles with a keywords "electronic medical record". More keyword were added "patient safety" and "hospital". In each keywords, terms are combine with the "OR" and "AND" operator. Then we filter the articles by year between 2014 and 2019 and journal type of document, more articles was excluded. After reading the title and abstract we select 48 documents, 3 documents were selected by full text review and assessed for eligibility. By reading the title and the abstract, 48 documents were selected, 20 document selected by full text review and assessed for eligibility. Articles that included and assessed for the eligibility in this review was an article that show an effect of patient safety in hospital in correlation on using electronic medical record (EMR), it is including some effect on medication error, prescribing error, error in the use of EMR that potentially endanger patient safety.

Exclusion criteria

We remove some articles which no correlation between EMR and patient safety, non-hospital EMR, and lack of detail about patient safety.

Figure 6 diagramatic representation of the steps involved in the literature search



RESULTS

A total of 87522 publication was identified through the database search, by adding more keywords we remove 79238 articles. After restrict article by year 2015-2019, english language, title and abstract reading, we select 48 articles for ful text reading. We remove 28 article that doesn't meet our criteria and select 20 articles for final review.

In the documentation input of EMR often to use keyboard and mouse (KBM) and speech recognition (SR). But KBM is more effective and potential patient harm chance increase when using SR [12].

Reaction patterns of doctors and nurses to the use of EMR/EHR

In the use of EMR, the doctor and nurses belief that that the quality of the patient data is better when EMR are easier to use and better aligned with their daily routine. Other factor that influence the willingness of doctors and nurses to use EMR are support from the IT department, more bottom-up communication, more innovative culture, more authentic leadership, etc [3, 13].

Information security

Given that a service is a system with various subsystems and complex parts, then the element of information becomes very important, moreover to avoid the mistakes mentioned above. In this case fasyankes shall ensure security in data storage systems and access systems of medical records of patients. With EMR, obviously very helpful [5].

Time efficiency

Order-Taker system in EMR can reduce the energy and cost in delivering information between service sections. Patients and their families do not need to manually carry out the forms (lab checks) and sheets (lab results, radiology and prescriptions). More convenient, no hassle and without having to queue for each time will take medical action or take medication [2, 14–16].

Continuous history

The EMR system allows online and integrated databases in spite of different urban hospital locations. Older patients do not need to register as new patients, but simply by showing a medication card or mentioning the medical record number at another online hospital. This makes it easier for patients and doctors to continue treatment wherever the patient is [6, 17].

Avoid the mistake of patient identity

Transfusion error is 49% because blood is given to the wrong patient, wrong identification. The use of EMR allows hospitals to store electronic data each patient is equipped with a self-image, for helping afoid the mistake of patients data because the same of the name and date birth. [10, 18–20]

Other benefits of EMR/EHR

One of the most important function of EMR implementation is to improve patient safety in hospital, in addition to reducing hospital cost. EMR reduce excess cost of Hospital Acquired Condition (HAC) by 16%, and reduce death due to HAC by 34% [21]. In communication between prescribers an pharmacists, EMR reduce the incorrect dose and clarification[4].While in acupuncture unit, EMR are useful in enhancing the security of acupuncture measures in terms of accessing instruction and monitoring the patient's reaction to treatment [22]. EMR also simplify us to trace down the patient allergic history. In some study we can track down patient's allergic history against beta lactam through hospital EMR [23]. Based on interviewing physician using EMR, the use of EMR could make access to patient medical history easier, saves time, improve error awareness in medication, prevent administration of allergic drugs, and improve ordering accuracy [24]. A hospital with comprehensive EHR system reported all basic function, along with 14 additional function. Those additional are: support for advance directives,

order entry for lab reports, radiology tests, consultation requests, nursing orders, ability to view radiology images, diagnostic test images, consultant reports, clinical decision support, clinical reminders, drug allergy results, drug-drug interactions, drug-lab interaction, and drug dosing support [25].

Weakness of EMR/EHR

As well as benefits, EMR also contributes some errors that threat patient safety such as inability to use Computerized Provider Order Entry (CPOE) properly can lead to prescribing errors [26, 27] and delay in medication [8]. In other articles other EHR-related Safety concern can occur in other situation like: mismatch between information needs and content display, and one component of the EHR is unexpectedly affected by condition another component like transition of patients between wards not reflected in EHR, resulting in missed medication or orders [2]. During the downtime period of EHR, whether it planned (e.g.; regular maintenance, updates of the software, etc.) or unplanned [e.g. equipment failure, cyber-attacks, etc.] have the potential in serious patient safety risk like: specimen misplaced or mislabeled, delay medication, placement of medication order disrupted, etc [28].

DISCUSSION

The use of Electronic Medical Record (EMR), which is the changing of conventional medical record usage to new technology based on computerization requires high consideration in planning and organizing. For details the benefits of using EMR in health services. Medical records as notes and important documents containing the overall record of the condition and development of the patient's health should be accountable by the healthcare provider involved in providing services to the patient

The use of medical records manually in the form of paper records has a problem that is long in searching the data or provide information when needed immediately and difficulty for collecting patient data is complex and fragmented. While the EMR describes the patient's health condition record in electronic format, and can be accessed by computer from a network with the main purpose of providing or improving the care and health services are efficient and integrated. In addition to the use of manual medical records, the use of telephones and conversations is an important facility for discussion and exchange of information to make patient service decisions. But after using the EMR, the health operator of medical record involved in the care of the patient simply sees the EMR to get a patient's medical summary and quickly make a decision. The benefits of EMR can be felt both by the health operator of medical record as health providers as well as for patients to obtain safety during receiving services

One of the most important function of EMR implementation is to improve patient safety in hospital, in addition to reducing hospital cost. EMR reduce excess cost of Hospital Acquired Condition (HAC) by 16%, and reduce death due to HAC by 34%. In the use of EMR, the doctor and nurses belief that that the quality of the patient data is better when EMR are easier to use and better aligned with their dialy routine.
Our review finds that the using of EMR can improve patient safety and hospital quality in term of serving their patients. But it can also endanger patient if the user cannot use it properly. Therefore, the hospital needs to improve their human resource with more knowledge about EMR.
All components of hospital services must understand and work with the purpose of maintaining patient safety. This is crucial, given the various mistakes that can occur in the service process: drug delivery; surgical procedures; radiology services; laboratory services; diagnostic determination and in the transfusion process

CONCLUSION

Electronic Medical Record (EMR) is a systematic collection of electronic patient-based medical information that is connected and integrated with the information system in the hospital network. Given

the importance of medical records, there is a need for progress in that. Recording of medical records digitally must be known how to record system and need to be developed in order to advance health service more effective and efficient so that can decrease the number of medical record data errors. Electronic Medical Record is able to store patient data in large numbers using only portable computer devices. In addition, electronic medical records may provide warnings if medical personnel wrongly administer the drug or there is drug reactions. Electronic Medical Record becomes an important part in patient safety. Electronic medical record is capable of storing multimedia medical data that can be accessed anytime, anywhere, and is very useful in storing data in the long term.

Electronic Medical Record also very useful for health care facilities and its implementation requires the ability of skilled human resources in using information technology-based resources, computer devices and programs, each user must be able to apply the computer device, then the support of all parties needed to be able to achieve the purpose of utilization of electronic medical records, both in terms of human resources and funds.

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