

## Readiness of Application of Electronic Medical Records in Bethesda Lempuyangwangi Hospital, Yogyakarta

I Gusti Agung Ngurah Putra Pradnyantara<sup>1)</sup>, Bhisma Murti<sup>1)</sup>, Didik Tamtomo<sup>2)</sup>

<sup>1)</sup>Masters Program in Public Health, Universitas Sebelas Maret

<sup>2)</sup>Faculty of Medicine, Universitas Sebelas Maret

### ABSTRACT

**Background:** Based on the strategic plan of the Ministry of Health of the Republic of Indonesia for 2020-2024, all hospitals can gradually implement electronic medical records. However, there are still many obstacles experienced by hospitals in implementing Electronic Medical Record (EMR), readiness assessments can be used to determine readiness, indications and requirements in facilitating the implementation of EMR so as to avoid various obstacles during the implementation process.

**Subjects and Method:** This was a qualitative descriptive study with a case study design. The study was conducted at Bethesda Lempuyangwangi Hospital, Yogyakarta, from May to June 2022. The data collected was the readiness to implement EMR in terms of organizational alignment and management capacity, by conducting in-depth interviews with 7 people. The study subjects were determined by purposive sampling who were considered to have the capacity to make decisions related to EMR.

**Results:** Bethesda Lempuyangwangi Hospital in implementing EMR from organizational alignment is said to be ready, the board of directors has known and understood that the implementation of RME has many benefits, the organization has been planned and the unit leadership understands the implementation risk in case of failure, to anticipate this, a long-term vision has been prepared. Readiness to implement EMR from management capacity can be improved because the IT committee has not yet been formed consisting of stakeholder representatives and hospitals, organization is still within the scope of the hospital, where ICT has been included in the organization's strategic plan. The roles and responsibilities for EMR implementation are defined with clear accountability to vendors and have been documented, the board of directors has considered planning the EMR implementation budget, funding for ongoing clinical IT adoption and the required standards are included in future planning and will be part of the IT budget.

**Conclusion:** Bethesda Lempuyangwangi Hospital is ready to implement electronic medical records that will be applied to inpatient units, this can be seen from the alignment of the organization and management capacity where the culture, organization, leadership, strategy, information management, clinical staff, accountability and budget finance have been planned and have started held.

**Keywords:** Readiness, Electronic Medical Record

### Correspondence:

I Gusti Agung Ngurah Putra Pradnyantara. Masters Program in Public Health, Universitas Sebelas Maret. Jl. Ir. Sutami 36A, Surakarta 57126, Central Java. Email: gustipradnyantara1997@gmail.com. Mobile: +62 82146804776.

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### BACKGROUND

Medical Record is a file that contains records and documents about the patient's

identity, examination, treatment, actions and other services that have been provided to patients. Electronic Medical Record

(EMR) is one of the developments in the use of information technology in the world of health which has been started since 1992 until now and continues to develop (Evans, 2016).

The process of transforming manual medical records into electronic medical records undergoes several stages from year to year, electronic medical records are expected to be able to overcome the constraints of manual medical record-based clinical documentation which has many problems in the demands of information exchange among health care providers, financial and legal complexities of modern healthcare environment, increasing level of biomedical knowledge, increasing chronic care needs of an aging population, and medical errors associated with handwritten notes (PERSI, 2020).

The importance of assessing the needs and readiness of health service facilities to support the successful implementation of information and communication technology (e-health). Readiness for implementing health information systems can be assessed from various aspects, including core readiness, technological readiness, learning readiness, societal readiness and policy readiness. The needs assessment prior to implementation is based on 3 categories, namely the needs of provision of care, learning needs, and information needs. Lack of readiness causes the organization to be weak to undergo the process during the implementation of electronic medical records.

Adequate preparation from an organizational perspective makes it possible to adjust the system as well as constraints in the workflow during and after implementation. The transition period to new information systems and technologies can cause fear, anxiety and phobia of using computers so that staff acceptance is a major determinant of the successful implementation of

information systems. A readiness assessment prior to the implementation of an information system can be used to determine readiness, indications and requirements in facilitating the implementation of EMR (Diero et al., 2006).

Bethesda Lempuyangwangi Hospital is one of the hospitals that has implemented electronic medical records. Bethesda Lempuyangwangi Hospital currently uses electronic medical records for outpatient and emergency patient services, but for inpatient services, electronic medical records have not yet been implemented, Bethesda Lempuyangwangi Hospital has prepared a comprehensive EMR implementation in order to improve the services provided. The implementation planning process has started and has gone through a preparatory process such as meetings with system developers and workshops. The purpose of this study was to assist Bethesda Lempuyangwangi Hospital in assessing the readiness for the application of electronic medical records, especially in inpatient units.

## SUBJECTS AND METHOD

### 1. Study Design

This was a qualitative descriptive study. The case in this study was the readiness of Bethesda Lempuyangwangi Hospital to implement electronic medical records. This research focuses on organizational alignment and management capacity.

### 2. Subjects and Objects

The subjects of this study were determined by purposive sampling. Determination of research subjects based on certain criteria, the subjects in this study were decision makers who represented the management and users of EMR amounted to 7 people 1. People who considered to have the capacity (holding a position) in making decisions regarding the implementation of EMR. Consists of: President Director, head of

administration and finance, Head of Medical Record Installation, Head of Inpatient Installation, Head of Information Technology, head of radiology/ physiotherapy laboratory, doctors who provide inpatient services

### 3. Study Variable

In this study, there were 2 variables, namely readiness for the application of electronic medical records in terms of organizational alignment and readiness for application of electronic medical records in terms of management capacity.

### 4. Study Instrument

This study uses:

- a) Observation guidelines by conducting initial interviews regarding the use of electronic medical records
- b) Stationery and voice recording equipment
- c) Interviews with 7 people consisting of: President Director, head of administration and finance, Head of Medical Record Installation, Head of Inpatient Installation, Head of Information Technology, head of radiology / physiotherapy laboratory, doctor who provides inpatient services

### 5. Data Analysis

Data analysis in this study was carried out during data collection, and after completion of data collection within a certain period. The steps of data analysis are as follows:

- a. Data reduction  
The data from inside interviews with officers were carefully recorded and recorded. the data that has been collected is summarized, the main things are selected so that they focus more on the important things. In this stage, researchers use open code software to help code and reduce data
- b. Data Display  
After the data is reduced, the next step is to present the data to make it easier to

understand and plan further work based on the results of interviews.

### c. Conclusion Drawing/verification

The third step in analyzing qualitative data according to Miles and Huberman is drawing conclusions and verification. The conclusions obtained from in-depth interviews related to the readiness to apply electronic medical records were triangulated with source triangulation.

## RESULTS

### 1. Overview of Research Locations

Bethesda Lempuyangwangi Hospital is a Primary hospital which is located at Jalan Hayam Wuruk 6, Yogyakarta, Bausasran Village, RT 43 RW 11, Danurejan District, Yogyakarta City, DI Yogyakarta Province with ownership of 43 beds, land area of 4,167 m<sup>2</sup>, building area of 2,809,404 m<sup>2</sup>, owner/manager of the hospital. is a Christian Foundation for Public Health (YAKKUM) with a hospital operating license number from the Yogyakarta City Health Office No. 503/0978 dated January 12, 2017. VISION The Hospital is to be a trusted, professional, compassionate and people's choice hospital. The hospital's MISSIONS include: To provide holistic, quality, affordable and environmentally friendly health services, to provide health services that focus on customer satisfaction. Building competent, committed, and characterized human resources according to YAKKUM's work culture. Manage the implementation of health services effectively and efficiently. Bethesda Lempuyangwangi Hospital has the motto "Serving With Love Towards Health"

### 2. Readiness in the application of electronic medical records in terms of Organizational Alignment

#### a. Culture

Based on the results of interviews with informants, informants 1 and 2 said that EMR is

seen as a technology to enable quality care with the aim of improvement. Triangulation conveys that the EMR Implementation can embrace change and create a new solution, the EMR planning process involves all departments where it is team oriented and emphasizes communication and collaboration. Triangulation also conveys that in this EMR doctors are actively involved in planning and making decisions regarding clinical and managerial interests. Clinicians know that EMR patient data can be used as a decision maker and can clearly articulate how EMR supports quality goals.

#### **b. Organisation**

According to informant 1, the hospital already has a systematic plan in adopting ICT in the organization, according to informant 3 the hospital has developed an organizational plan that is in accordance with the needs of the hospital in implementing EMR. Triangulation said that all aspects of the organization are trying to improve the quality of health and management of workflow efficiency, so organizational planning has been arranged systematically. In the application of EMR there are internal conflicts or conflicts, but these conflicts are resolved by communication. To improve the efficiency and quality of this EMR, hospitals usually carry out regular evaluations and make necessary adjustments.

#### **c. Leadership**

Informant 3 said that the board of directors understands the benefits of EMR and the risks of implementation in the event of a failure, this is also the same as what other informants said and reinforced by triangulation where the board of directors tries to be careful in implementing EMR so that the board of directors sets a clear and consistent vision of how EMR supports efficiency and quality improvement goals. ensure the creation of strategies, systems and methods to achieve quality and efficiency objectives.

have a clear understanding of the efficiency goals and quality of EHR initiatives and participate in planning activities.

#### **d. Strategy**

According to Informants 1, 2 and 3 the EMR implementation strategy has been prepared with a certain priority scale and continues to be developed, one of which is in the IT department. Triangulation conveys that the EMR Implementation Objectives have been developed to support the quality strategy. IT strategic planning is a continuous process that reflects ongoing changes in internal and external conditions; modifications to the Strategic Plan are made as needed. Improvement of the quality of the model is carried out by combining the EHR and other data that has been designed, currently priorities for the efficiency and quality matrix have been defined and linked to operational objectives and incentives.

### **3. Readiness in implementing electronic medical records in terms of Management Capacity**

#### **a. Information management**

Information Management at Bethesda Lempuyangwangi Hospital According to Informant 4, the establishment of an IT committee consisting of internal and hospital stakeholder representatives has not yet been carried out, but informant 3 conveys that the formation of an organizational division of tasks in the implementation of EMR has been carried out within the hospital's internal, triangulation explained that a structure has been formed organization, currently organizing is still within the scope of the hospital, and ICT has been included in the organization's strategic plan, there has been a long-term plan but there is no road map (SIM Plan), currently preparing a special plan for a certain period of time which is periodically updated, which will later be used as usage reports and analysis of EMR document types, all of which

are already in the user manual. The process for evaluating data integrity is carried out on a regular basis using validated tools and corrective actions are taken.

#### **b. Clinical & Administrative Staff**

Informants 1 and 2 said that the use of a computer-based system was very helpful in the process of collecting, retrieving and reporting internal hospital health data. Informant 4 added that the use of EMR will be very helpful not only in data collection but also in assisting in the processing management process and work effectiveness. Triangulation conveys the complexity of EMR can help simplify decision making and overall organization. the involvement of medical personnel and other staff in the hospital's efforts to adopt EMR was carried out with a lot of support and positive response in the transition to EMR. Staffing requirements for the implementation and use of EMR have been documented in the staffing model, detailing current staffing and proposed needs; requirements have been included in the planning process. Staff and other human resources dedicated to EMR vendor contractors are experienced in the selection of IT vendors and contracts, the directors analyze the products offered to match the needs and capabilities of the organization with the available solutions and determine the optimal approach and contract terms; the clinical requirements themselves have been documented in detail which will be used in addition to the contract. Financial and non-financial incentives for physicians and other staff users for EMR adoption are currently being discussed by the board of directors.

#### **c. Accountability**

Informants 3 and 6 stated that there is an Agreement in selecting EMR which is intended to incorporate staged performance related to payments to vendors based on on-time procurement, implementation, conver-

sion, and service level of the agreement. Triangulation also confirms that Roles and responsibilities for EMR implementation have been defined with clear accountability for clinics and vendors and have been documented in the project charter. Staff reporting on the implementation and progress of EMR adoption for executive management and directors will be systematic, matrix-based and will include reports on Long-term project milestones.

#### **d. Finance and Budget**

According to informants 6 directors have considered budget planning and cost-benefit of EMR implementation, IT is managed on a separate line item in the operating budget and by a designated individual, Triangulation conveys that EHR technology is considered as a long-term investment. Incorporates quantifiable non-returns. The costs and benefits of EMR have been evaluated in a cost-benefit analysis and the results are communicated to management, the total cost of ownership calculation taking into account the initial decreased productivity and ongoing training costs. The EMR implementation project fund has a separate budget outside of the implementation phase. The annual budgeting process will incorporate appropriate EMR cost and revenue impacts as a result of workflow efficiency and quality improvement. Informant 3 stated that the Head of Finance often works closely with each director to understand the budget requirements and financial implications of EMR. Funds for ongoing adoption of clinical IT and standards needed to enable enhanced efficiency and quality of care are still being included in future planning and will form part of the IT budget.

## **DISCUSSION**

This study is a qualitative descriptive study with the aim of assessing the readiness of the application of electronic medical

records, especially in inpatient units. This research was conducted by in-depth interviews with research subjects. The subjects of this study were determined by purposive sampling. Determination of study subjects based on certain criteria. Subjects in this study were decision makers who represented the management and users of EMR totaling 7 people who were considered to have the capacity (holding positions) in making decisions regarding the implementation of EMR. Consists of: President Director, head of administration and finance, Head of Medical Record Installation, Head of Inpatient Installation, Head of Information Technology, head of radiology/physiotherapy laboratory, doctors who provide inpatient services.

Bethesda Lempuyangwangi hospital sees electronic medical records as a technology to enable quality care with the aim of good repair. Triangulation also conveys that the EMR Implementation can embrace change and create a new solution, the EMR planning process involves all departments which is team oriented and emphasizes communication and collaboration. Triangulation also conveys that in this EMR doctors are actively involved in planning and making decisions regarding clinical and managerial interests. Clinicians know that EMR patient data can be used as a decision maker and can clearly articulate how EMR supports quality goals.

The hospital has a systematic plan in adopting ICT in the organization, the hospital has developed an organizational plan that is in accordance with the needs of the hospital in implementing RME. All aspects of the organization strive to improve the quality of Health and management of workflow efficiency. In the application of RME found internal conflicts or conflicts, but these conflicts can be resolved by communication. To improve the efficiency and quality of this RME, Bethesda Lempuyangwangi

Hospital conducts periodic evaluations and makes necessary adjustments.

The Board of Directors also understands the benefits of RME and the risks of implementation in the event of a failure, the Board of Directors of Bethesda Lempuyangwangi Hospital tries to be careful in implementing EMR so that they have set a clear and consistent vision of how EMR supports efficiency and quality improvement goals. ensure the creation of strategies, systems and methods to achieve quality and efficiency objectives. have a clear understanding of the efficiency goals and quality of EMR initiatives.

The EMR implementation strategy has been prepared with a certain priority scale and continues to be developed, one of which is in the IT department. Objectives The implementation of EMR has been developed to support the quality strategy. IT strategic planning is a continuous process that reflects ongoing changes in internal and external conditions. Improvement of the quality of the model is carried out by combining EMR and other data that has been designed.

Based on this description, it can be said that Bethesda Lempuyangwangi Hospital is in readiness to implement EMR in terms of Organizational Alignment, this is in accordance with the theory presented by CCCERA (2007), namely Organizational alignment is an assessment of the organization's alignment to support EHR adoption, and readiness to embrace changes that are needed. related to EHR. Hospitals should specify four Readiness Areas to measure alignment including Culture, Organization, Leadership and Strategy. This is reinforced by Ghazisaeidi (2013), that organizational alignment focuses on forming groups with sufficient power to direct change, promote activities, provide training for new behaviors, increase culture and awareness, and

create appropriate relationships based on perspectives and strategies, In a study conducted on the design of an EHR implementation readiness assessment tool in California, the highest priority was given to proper understanding of EHR, readiness to achieve higher quality care, involvement by physicians, personnel, and patients, modes of involvement in clinical and managerial roles.

Bethesda Lempuyangwangi hospital has currently organized the internal scope of the hospital, and information and technology department has been included in the organization's strategic plan, there has been a long-term plan but no road map (SIM plan), currently preparing a special plan for a certain period of time which periodically updated, which will later be used as a report on the use and analysis of RME document types. The process for evaluating data integrity is carried out on a regular basis using validated tools and corrective actions will be taken.

All staff of Bethesda Lempuyangwangi Hospital have understood the use of a computer-based system which is very helpful in the process of collecting, retrieving and reporting internal health data at the hospital. They said that the use of EMR would be very helpful not only in data collection but also in processing management processes and work effectiveness, where the complexity of EMR can help simplify decision making and overall organization. The involvement of medical personnel and other staff in the hospital's efforts to adopt EMR was carried out with a lot of support and positive response in the transition to EMR. Staffing requirements for the implementation and use of EMR have been documented in the staffing model, detailing current staffing and proposed needs; requirements have been included in the planning process. Staff and other human

resources dedicated to vendor contractors are experienced in the selection of IT vendors and contracts, the directors analyze the products offered to match the needs and capabilities of the organization with the available solutions and determine the optimal approach and contract terms, the clinic's own requirements have been documented in detail which will be used in addition to the contract. Financial and non-financial incentives for doctors and other staff users in the adoption of EMR are currently being discussed by the board of directors.

There is an agreement in selecting an EMR that is intended to incorporate incremental performance with respect to payments to vendors based on on-time procurement, implementation, conversion, and service level agreements. Roles and responsibilities for EMR implementation have been defined with clear accountability for clinics and vendors and have been documented. Staff reporting on the implementation and progress of EMR adoption for executive management and directors will be systematic, matrix-based and will include reports on long-term project milestones.

Bethesda Lempuyangwangi Hospital has taken into consideration the budget planning and cost-benefit of the EMR implementation, IT is managed on a separate line item in the operating budget and by a designated individual, EHR technology is considered a long-term investment. Investment is analyzed over a longer period of time. The costs and benefits of EMR have been evaluated in a cost-benefit analysis and the results are communicated to management, the total cost of ownership calculation taking into account the initial decreased productivity and ongoing training costs. EMR implementation project funds have a separate budget outside the implementation phase. The annual budgeting process will

incorporate appropriate EMR cost and revenue impacts as a result of workflow efficiency and quality improvement. The chief financial officer frequently works closely with each board of directors to understand the budgetary requirements and financial implications of EMR. Funds for ongoing adoption of clinical IT and standards needed to enable enhanced efficiency and quality of care are still being included in future planning and will form part of the IT budget.

Based on the description above, it can be said that RS Bethesda Lempuyangwangi in the readiness to implement electronic medical records in terms of management capacity has gone well or is said to be ready, which is based on theory (Ghazisaeidi et al., 2014) the role of management and leadership in management readiness in implementing EMR there must be planning and preparation of project initiation documents, preparing strategic plans, determining and defining business process flows based on a list of expectations and user needs, forming a strategic system development team, focusing on change management (work strategy), participation in information/data architecture, support In the process of implementing EMR where this has been carried out by the directors of Bethesda Lempuyangwangi Hospital, this is also strengthened based on Ajami (2011) which stated that it was to be ready if four components of readiness have been involved including the executive team, finance, strategic plan, monitoring quality improvement and care management. The indications of readiness in this section require increased management focus, potential process development, or planning .

#### **AUTHOR CONTRIBUTION**

I Gusti Agung Ngurah Putra Pradnyantara is the main researcher who selects the topic,

searches for and collects research data. Bhisma Murti and Didik Tamtomo analyzed data and reviewed research documents and provided input and suggestions in conducting research.

#### **CONFLICT OF INTEREST**

There is no conflict of interest in this study.

#### **FUNDING AND SPONSORSHIP**

There is no conflict of interest in this study.

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