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Factors Influencing the Implementation of Electronic Medical Record Systems at Bhayangkara Hospital and Benyamin Guluh Kolaka Hospital

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ABSTRACT

Introduction: Electronic Medical Records (EMR) are a crucial technology for improving the efficiency and quality of healthcare services compared to manual, paper-based systems. This study compares the implementation of EMRs at the Benyamin Guluh Hospital in Kolaka and Bhayangkara Hospital in Kendari to evaluate differences in efficiency and quality of healthcare services after the implementation of EMRs.

Method: This study employed a qualitative approach with phenomenology. The researcher served as the key instrument, with data collection techniques including in-depth interviews and participant observation. The study population consisted of IT directors and staff as primary informants, as well as doctors, nurses, laboratory personnel, pharmacists, and patients as regular informants. The sample was drawn using purposive sampling. Data were collected from 14 informants and analyzed inductively.

Result: Bhayangkara Kendari Hospital has made significant progress in integrationElectronic Medical Records, with adequate technological infrastructure, fast and secure data access, and comprehensive staff training. In contrast, Benyamin Guluh Hospital in Kolaka faces challenges related to inadequate infrastructure and challenges in training and network quality. Despite progress in reducing paper use and improving coordination between units, technical issues and inadequate training impact efficiency and patient satisfaction.

Conclusion: The needs of both hospitals include improving information technology infrastructure, regular and comprehensive training, policy evaluation and adjustment, improving data management and security, and increasing coordination between institutions.

Introduction

Quality and efficient health services are an important aspect in efforts to improve public health.[1] One of the factors that contributes to the quality of health services is the implementation of an electronic medical record system in hospitals.[2] Electronic medical records enable digital management of patient data, facilitate access to information, and improve coordination between healthcare professionals in providing integrated services.[3] An Electronic Health Record (EHR) refers to a digital information system used to electronically record, store, and manage patient health information. Electronic Health Records replace the traditional use of physical medical records and move the process into a digital environment.[4]

Effective implementation of electronic medical records can significantly improve hospital operational efficiency. A study in the United States found that hospitals with well-implemented electronic medical records had shorter wait times and more efficient bed utilization compared to hospitals without electronic medical records. Research conducted by Mignerat showed that electronic medical records can reduce patient data retrieval time, reduce typing errors, and accelerate clinical workflow.[5] Thus, effectively implemented electronic medical records can optimize hospital operational processes and increase medical staff productivity.

In addition to operational efficiency, effective implementation of electronic medical records can also improve the quality of hospital services.[6] Properly used electronic medical records can provide more complete and accurate information, thus supporting better clinical decision-making.[7] Hospitals with electronic medical records have higher levels of patient safety and lower rates of medical errors.[8] With accurate and complete information, the quality of patient care can be improved and the risk of medical errors can be minimized.[5]

Effective implementation of electronic medical records also helps hospitals comply with regulations set by regulatory agencies and governments. Hospitals with electronic medical records have higher rates of adherence to recommended care practices.[9] Additionally, electronic medical records also facilitate better documentation and reporting, thereby helping hospitals meet regulatory requirements.[10] Compliance with these regulations is essential to maintain service quality standards and avoid sanctions from regulatory bodies.

Electronic Medical Records play a crucial role in facilitating workflow for healthcare professionals, such as doctors, nurses, pharmacists, and laboratory personnel. The use of electronic medical records can improve the efficiency of clinicians' workflows by providing quick and easy access to patient information. Electronic medical records can expedite the documentation process and reduce the time required to access patient medical records.[5] Thus, electronic medical records can help healthcare workers optimize their time and resources.

Besides facilitating workflow, electronic medical records also play a crucial role in recording and accessing a patient's complete and accurate medical history. Electronic medical records can provide more comprehensive information about a patient's medical history, including notes from various healthcare professionals involved in the patient's care.[6] Electronic medical records can improve the accuracy and completeness of medical records, thereby supporting better clinical decision-making.[11]

Furthermore, electronic medical records facilitate coordination and collaboration between various healthcare professionals in providing comprehensive patient care. Electronic medical records can improve communication and coordination between doctors, nurses, and other healthcare professionals through features such as electronic messaging systems and shared access to medical records.[12] The importance of electronic medical records in supporting better care coordination, especially in the case of patients with chronic conditions requiring multidisciplinary care.[13]

Electronic Medical Records offer numerous benefits to administrative and financial staff in hospitals. They can simplify patient data management, such as registration, scheduling, and updating patient information.[14] Electronic medical records can improve the efficiency of administrative processes by reducing data entry errors and facilitating a smoother workflow.[15]Thus, electronic medical records can help administrative staff manage patient data more accurately and efficiently.

In addition to patient data management, electronic medical records also assist in hospital financial administration. Electronic medical records can simplify patient billing and payment management and facilitate integration with the hospital's financial system. Electronic medical records can improve the accuracy of diagnosis and procedure coding, which impacts billing and insurance claims management.[16] Thus, electronic medical records can help financial staff manage the financial aspects of the hospital more efficiently and accurately.

Electronic medical records also facilitate more accurate and efficient reporting for hospitals. They can provide more complete and accurate data for performance reporting and regulatory compliance. They assist in collecting and reporting quality-of-care data necessary for accreditation and quality improvement initiatives.[17] Thus, electronic medical records can help hospitals meet reporting requirements more accurately and efficiently.

For patients, effective implementation of electronic medical records can significantly improve the quality of healthcare services. Hospitals with well-implemented electronic medical records have higher levels of patient safety and a lower risk of medical errors. Electronic medical records can provide more complete and accurate information about a patient's medical history, thus supporting better clinical decision-making by healthcare professionals. Thus, electronic medical records can help improve the quality of care received by patients.

In addition to service quality, effective implementation of Electronic Medical Records also plays a crucial role in minimizing the risk of medical errors for patients. Electronic Medical Records can reduce errors in the medication prescribing process and help prevent adverse side effects or drug interactions.[18] Other study also found that electronic medical records can reduce the risk of errors in clinical decision-making by providing electronic clinical alerts and guidance. Thus, electronic medical records can improve patient safety and reduce the risk of medical errors that could harm patients.[19]

Furthermore, effective implementation of electronic medical records can provide a better patient experience in receiving healthcare. Patients are more satisfied with hospital services that use electronic medical records because their information is more easily accessible and the care process is smoother.[20] Other research has also shown that electronic medical records can increase patient engagement in the care process through features such as access to electronic medical records and online communication with healthcare professionals.[21] Thus, electronic medical records can provide a better experience for patients in receiving comprehensive and patient-centered health care.

Although Bhayangkara Hospital and Benyamin Guluh Hospital are both type C hospitals, there are differences in the duration of electronic medical records implementation between the two hospitals. Bhayangkara Hospital has been implementing electronic medical records for one year, while Benyamin Guluh Hospital has only been implementing electronic medical records for four months. Selecting two hospitals with the same type but different durations of electronic medical records implementation allows for a comparison of the maturity level of electronic medical records implementation. The similarity in type also minimizes the influence of differences in hospital type on electronic medical records implementation. Thus, research can focus more on other factors that influence electronic medical records implementation, such as regional characteristics and hospital management.

Based on the study of the problem above, the researcher is interested in analyzing Electronic Medical Records in more depth so that this research was conducted with a qualitative research type with the title: Analysis of the Implementation of the Electronic Medical Record System at Bhayangkara Hospital, Kendari City and Benyamin Guluh Kolaka Hospital.

Method

This study employed a qualitative approach with phenomenology. The researcher served as the key instrument, with data collection techniques including in-depth interviews and participant observation. The study population consisted of IT directors and staff as primary informants, as well as doctors, nurses, laboratory personnel, pharmacists, and patients as regular informants. The sample was drawn using purposive sampling. Data were collected from 14 informants and analyzed inductively.

Result

Implementation of Electronic Medical Records at Bhayangkara Hospital, Kendari City

The results of this study present key indicators regarding the implementation of electronic medical records at Bhayangkara Hospital in Kendari City and its impact on hospital services. As one of the main healthcare facilities in Kendari City, Bhayangkara Hospital has modernized its health information management system by implementing electronic medical records. This study aims to evaluate various indicators related to the implementation of the electronic medical records system, including information technology infrastructure, service efficiency, and patient satisfaction. By focusing on these indicators, it is hoped that a clear picture will be obtained regarding how the digitization of medical records affects the operations and quality of services at this hospital.

1. Hardware and Software Availability

The hospital director explained that the implementation of electronic medical records was driven by hospital accreditation standards and collaboration with the BPJS. The planning process involved providing the necessary hardware and software, despite budgetary constraints. According to key informants from the Bhayangkara Hospital Director, the implementation of electronic medical records was driven by hospital accreditation standards and collaboration with the BPJS. The planning process involved providing the necessary hardware and software, despite budgetary constraints.

The main objective of these steps is to ensure that hardware and software are available as needed. This was confirmed by a key informant, who stated,

"We have tried to provide adequate hardware and software, but budget constraints are a major challenge" (IK.1 July 22, 2024).

Based on confirmation from key informants, IT staff added that facilities and infrastructure, such as computers and networks, are available, but still face infrastructure challenges.

We already have enough devices, but sometimes there are still problems with the network infrastructure (IK.1 July 22, 2024).

Regular informant confirmation Doctors and nurses stated that the Electronic Medical Records system makes their work easier, although there are still technical obstacles to overcome.

Electronic Medical Records are very helpful, but we often encounter technical issues that hinder us (IK.1 July 22, 2024).

Confirmation from regular informants of laboratory and pharmaceutical personnel also highlighted the importance of adequate hardware and software to support the system.

"Adequate hardware is crucial for our operations," said a laboratory worker (IK.1 July 22, 2024).

2. Data Access Speed and Security

In the increasingly advanced digital era, speed and security of data access are crucial pillars in implementing an electronic medical records system. Bhayangkara Kendari Hospital fully understands this urgency and prioritizes it.

Based on information from the hospital director, policies that prioritize data security and fast and easy access are the main foundations for implementing electronic medical records at this hospital.

Data security and fast access are our top priorities (IK.2 22 July 2024).

Based on confirmation from key informants, IT personnel added that each user has a user ID with a high level of security, supported by a firewall and antivirus, as well as a three-stage data backup procedure (external and internal).

Each user has a user ID with high security, supported by firewall and antivirus, (IK.2 July 22, 2024).

From the perspective of ordinary physician informants, the speed of access to information through electronic medical records is much better

than the previous manual system, which makes it easier for them to provide more efficient medical services.

The speed of information access via RME is much better than the manual system (IK.2 22 July 2024).

Not only that, regular patient informants also feel the benefits of this system, with the registration process becoming faster although sometimes there are still network stability issues that affect the speed of service.

The registration process is faster with RME, but sometimes the network is unstable (IK.2 July 22, 2024).

This shows that despite many improvements, there are some areas that still require attention to ensure optimal data access speed and security.

3. User Training and Security

Based on confirmation from key informants from the Director, although training is still lacking, efforts are continuing to strengthen the field of electronic medical records.

Training is still lacking, but we continue to strive to improve the capabilities of our Human Resources (IK.3 July 22, 2024).

Key informants IT staff provide annual training facilitated by the application vendor free of charge.

We hold annual training facilitated by the application vendor free of charge (IK.3 July 22, 2024).

Doctors and nurses receive regular training from the IT team, which is very helpful in adapting and using the electronic medical record system.

Regular training from the IT team is very helpful in system adaptation (IK.3 July 22, 2024).

Laboratory and pharmacy staff also receive regular training, especially when there are changes to the application menu, which enables them to work more efficiently.

Regular training is very helpful, especially when there are changes to the application menu, (IK.3 July 22, 2024).

4. Electronic Medical Records User Policy

Based on information from the Director, the policy for using electronic medical records includes data security, easy access, and efficient operationalization.

Our policies cover data security, easy access, and efficient operationalization (IK.4 22 July 2024).

IT staff coordinate administrative matters with the Ministry of Health and relevant agencies to ensure compliance with applicable regulations.

We coordinate administration with the Ministry of Health to ensure regulatory compliance (IK.4 22 July 2024).

This policy ensures that the RME system can support increased efficiency and hospital services.

5. Data Documentation and Archiving Procedures

Based on information from the Director, data documentation and archiving procedures are clearly regulated, following guidelines from the Ministry of Health.

Our procedures follow the guidelines from the Ministry of Health (IK.5 22 July 2024).

IT staff explained that the RME system allows for electronic documentation of data, although some documents still need to be manually signed and then uploaded to the system.

Some documents still need to be manually signed and uploaded to the system (IK.5 22 July 2024).

Data backup procedures are carried out periodically to ensure that data remains safe and secure.

Data backups are performed periodically to ensure security (IK.5 22 July 2024).

The implementation of electronic medical records at Bhayangkara Hospital in Kendari involves various aspects, from providing adequate information technology infrastructure, training and development of human resources, to strict policies and procedures to ensure system security and efficiency. Despite facing several challenges, such as budget constraints and network stability, efforts continue to improve service quality through the use of electronic medical records. Interviews indicate that despite some challenges, the majority of users find the system helpful.

Implementation of Electronic Medical Records at the BLUD Benyamin Guluh Hospital in Kolaka

The results of this study present key indicators regarding the implementation of electronic medical records at Benyamin Guluh Hospital, Kolaka, and its impact on hospital services. Benyamin Guluh Hospital, as one of the healthcare facilities in the Kolaka region, has implemented Electronic Medical Records with the aim of improving the efficiency of patient data management and the quality of healthcare services. This study focuses on several key indicators, including information technology infrastructure, speed and security of data access, policies and procedures for the use of Electronic Medical Records, user training, and data documentation and archiving procedures. By highlighting these indicators, it is hoped that a comprehensive understanding of how the implementation of Electronic Medical Records affects the operations and services at this hospital can be obtained.

1. Hardware and Software Availability

Based on the results of interviews with key informants, the Director

We decided to implement an electronic medical records system to make patient data management more efficient and accurate. Furthermore, this is part of our efforts to comply with accreditation standards and improve the quality of healthcare services. (IK.1, July 12, 2024).

The duties and responsibilities of IT/Medical Records staff include ensuring the integration of patient data and ensuring the accuracy and accessibility of information to authorized staff. Based on interviews with IT staff.

My job in managing the EMR is to ensure that all patient data, procedures, diagnoses, medications, and other EMR-related information are well integrated. My responsibilities include data entry, ensuring the accuracy of information, and granting access to authorized staff. Despite initial difficulties in adapting, various parties such as doctors, nurses, laboratory personnel, and pharmacists have finally felt the benefits of the Electronic Medical Record in simplifying their daily work (IK.1, July 12, 2024).

2. Data Access Speed and Security

Data access speed and security are important indicators in the implementation of Electronic Medical Records. Based on an interview with the Director

The process involved many parties, including management and the IT team. However, we encountered several challenges due to budget and time constraints, resulting in a phased implementation, and training was not fully optimized. (IK.2, July 12, 2024).

According to key informants, IT/Medical Records staff often face challenges related to data access speed due to reduced bandwidth and server downtime. Based on interviews with IT staff,

Frequent issues with data access speed are caused by reduced bandwidth from internet providers. Server downtimes also occur, which can disrupt our patient care. (IK.2, July 12, 2024).

According to regular informants, doctors and nurses also reported that data access is highly dependent on network conditions. This is based on an interview with a doctor.

"Until now, we've been dependent on the network. If the network happens to be good, access is quite fast. But if there's a network outage, it's

definitely delayed." A nurse also expressed a similar sentiment, "With a manual system, it still takes a lot of time to search and record. And then again, sometimes the network takes a while to load, so it takes a while for us to access and input data." (IK.2, July 12, 2024).

3. User Policies and Procedures

Establishing policies and procedures for the use of Electronic Medical Records is crucial to ensuring operational standards and data security protocols. Based on interviews with the Hospital Director,

We have established policies regarding operational standards and data security protocols. However, we still face challenges in implementing these policies consistently across the hospital. (IK.3, July 12, 2024).

IT or Medical Records staff explained that data backups are performed routinely and user management is implemented to ensure access is granted only to authorized personnel. This is based on interviews with IT staff.

We routinely back up our SIMRS data, and the SIMRS company we use has passed ISO 27001, ensuring data security. We also implement user management to ensure system access is granted only to authorized staff. (IK.3, July 12, 2024).

4. User Training and Skills

User training and skills in operating Electronic Medical Records are critical aspects of implementation, according to interviews with key IT staff.

For RME-related training, we have conducted RME training via Zoom with the SIMRS vendor and the Ministry of Health. We have never had offline training. (IK.4, July 12, 2024).

Based on interviews with regular informants, doctors and nurses felt that support was available, but specific training was still lacking. Based on an interview with a doctor.

"We've had mentoring, but I don't think we've had any special training." A nurse also said the same thing, "Yes, we were trained by IT, but the training was still basic, so it's often not enough to address the existing problems." (IK.4 July 12, 2024).

The limited number of IT personnel is also an obstacle in responding to various problems that arise.

5. Data Documentation and Archiving Procedures

Documentation and data archiving procedures are established to ensure patient medical data is recorded correctly and stored according to established policies. Based on interviews with IT staff.

Patient medical data is entered through electronic forms or recorded examination results in the Electronic Medical Record. We ensure that this data is recorded correctly and stored in the system according to established policies. (IK.5, July 12, 2024).

Overall, while the implementation of Electronic Medical Records at Benyamin Guluh Hospital has brought various benefits, there are still technical and operational challenges that need to be addressed. Developing network infrastructure, adding IT personnel, and increasing the frequency and quality of staff training are key challenges.

Several suggestions proposed by informants to improve the performance and efficiency of the Electronic Medical Records system in this hospital. Based on interviews with key informants of IT staff.

From a network perspective, I think it's important to add another provider (internet network provider) since we've only been working with one provider here and adding network infrastructure. (IK.5, July 12, 2024).

Discussion

Analysis of the Implementation of the Electronic Medical Records System at Bhayangkara Hospital, Kendari City

Bhayangkara Hospital in Kendari City has built an adequate information technology infrastructure to support the implementation of an electronic medical records system. The hospital has modern hardware and reliable software to manage patient data. A stable internet connection is also a key advantage, enabling the smooth operation of the electronic medical records system without significant technical obstacles. This infrastructure development reflects the hospital management's commitment to improving the efficiency and quality of healthcare services through information technology.

Several studies have consistently shown that adequate information technology infrastructure is crucial for the successful implementation of Electronic Medical Records. According to research conducted by,[22] A strong information technology infrastructure, including reliable hardware and internet networks, is crucial in ensuring the successful operation of Electronic Medical Records. In addition, research by[23]also emphasized that hospitals with adequate information technology infrastructure tend to have higher operational efficiency and better service quality. Another study by[24]revealed that hospitals that invest in health information technology can see significant improvements in the quality of patient care and reductions in operational costs.

Thus, the investment made by Bhayangkara Hospital in Kendari City in building a solid information technology infrastructure is the right step to support the implementation of Electronic Medical Records and improve the quality of healthcare services. A stable internet network and reliable hardware and software not only ensure the smooth operation of Electronic Medical Records but also increase the efficiency and accuracy of patient data management, ultimately improving patient satisfaction and the overall quality of healthcare.

Analysis of the Implementation of the Electronic Medical Records System at Benyamin Guluh Hospital, Kolaka

Benyamin Guluh Hospital in Kolaka has been working to build an information technology infrastructure to support the implementation of an electronic medical records system. Although the hospital has adopted sufficient hardware and software for the basic needs of an electronic medical record, it still faces significant challenges related to budget and resource constraints.

Existing hardware, such as computers and servers, is sufficient to perform the basic functions of Electronic Medical Records. However, increased storage capacity and processing capabilities are still needed to optimize the use of this system. According to a study by[2]Budget constraints often affect the speed and quality of information technology implementation in healthcare facilities, and this is in line with the experience of Benyamin Guluh Kolaka Hospital.

Facing budget constraints, infrastructure development is being implemented in stages. The hospital must adapt to available resources while continuing to gradually improve its information technology facilities. Research by[25]shows that a phased development strategy can help hospitals manage limited resources while continuously improving infrastructure.

Due to budget constraints, Benyamin Guluh Kolaka Hospital faces challenges in ensuring that all aspects of its information technology are functioning optimally. However, the hospital's efforts to continuously improve facilities and adapt to existing resources demonstrate its commitment to implementing Electronic Medical Records. Future infrastructure improvements will be critical to improving operational efficiency and the quality of healthcare services at the hospital.

Conclusion

Bhayangkara Hospital in Kendari has made significant progress in integrating Electronic Medical Records, with adequate technological infrastructure, fast and secure data access, and comprehensive staff training. In contrast, Benyamin Guluh Hospital in Kolaka faces challenges related to inadequate infrastructure and challenges in training and network quality.

The needs of both hospitals include improving information technology infrastructure, regular and comprehensive training, policy evaluation and adjustment, improving data

management and security, and increasing coordination between institutions.

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