

# Factors Associated with the Implementation of Medical Records at the Konawe District Health Center, Indonesia

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## Abstract

**Background:** The implementation of medical records is vital to ensuring quality healthcare services by supporting patient care, administrative functions, and policy development. However, challenges such as limited resources, inadequate training, and insufficient infrastructure often hinder optimal medical record practices in health centers, particularly in developing regions like Konawe District, Indonesia.

**Objective:** This study aims to analyze the factors related to the implementation of medical records at the Konawe District Health Center.

**Methods:** A quantitative case-control study design was employed. The study population included all officers responsible for service quality at the health center, such as the head of the health center, administrative staff, and the person in charge of medical records. A total of 124 respondents were selected using the Simple Random Sampling technique.

**Results:** The findings indicated significant relationships between various factors and the implementation of medical records: adequate funding positively impacted medical record practices; skilled and trained personnel improved medical record implementation; Effective time management and adaptability supported better practices; strong leadership and organizational support enhanced medical record processes; adequate infrastructure was crucial for successful medical record management.

**Conclusion:** The study concludes that financial, human resource, organizational, time of change, and infrastructural factors significantly influence the implementation of medical records at the Konawe District Health Center. Addressing these factors is essential to improving medical record practices and overall healthcare service quality.

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**Keywords:** finance; human resources; time of change; organization; infrastructure; medical records

## Background

Medical records are a critical component in supporting the delivery of healthcare services to patients in hospitals. According to the Ministry of Health Regulation number 269/MENKES/PER/III/2008 concerning medical records, it is stated that medical records consist of patient data recorded during healthcare services (Apriyanti, 2016). Medical records serve as references for subsequent patient care, especially when a patient returns for treatment. The medical record must be readily available for review when a patient revisits, enabling healthcare workers to take appropriate actions or administer therapy

based on the patient's medical history, including past treatments and interventions. The availability and completeness of medical record files are essential when needed for such purposes (Wariyanti, 2014).

The health center is a cornerstone of healthcare in Indonesia, serving as a facility for primary health efforts, including both public health and individual health initiatives. Health centers prioritize promotive and preventive actions aimed at achieving the highest possible health standards in their service areas (PERMENKES RI, 2008). One key factor that determines the quality of healthcare services is the availability of accurate medical record data or information. The quality of health services, as related to medical records, spans administrative, documentation, financial, educational, research, and legal aspects (Suryanto, 2014). Therefore, the medical record unit must be managed efficiently and professionally to generate high-quality information, facilitating excellent healthcare services and aiding in management decisions (Susanto & Sugiharto, 2017).

The quality of information relies on three factors: accuracy, timeliness, and relevance. (a) Accuracy ensures that information is free from errors and is not misleading, reflecting the intended meaning. It is vital that information remains accurate throughout its transmission to avoid distortion. (b) Timeliness means that information must reach its intended recipient promptly; outdated information holds little value in decision-making processes. (c) Relevance refers to the utility of the information to the user; its relevance may vary depending on the individual's needs (Kemenkes RI, 2019; Siswati & Maryati, 2017). Indicators serve as representations of information, making it more meaningful for decision-making. The criteria for effective indicators include simplicity, measurability, attribution, reliability, and timeliness. (a) Simplicity means that indicators should be as straightforward as possible, both in terms of data collection and calculation formulas. (b) Measurability means that the indicators must be clear and quantifiable, allowing for comparisons across different settings or time periods. (c) Attributability means that indicators must be relevant to decision-making, providing specific data needed for particular decisions. (d) Reliability indicates that indicators must be supported by accurate, thorough data collection. (e) Timeliness means that indicators must be aligned with the timeframe of decision-making, ensuring that data collection, processing, and reporting occur in a timely manner (Kemenkes RI, 2003).

In Indonesia, the application of medical records in healthcare services is still relatively slow. This is evident from the gaps in reporting in several provinces within the Indonesian Health Profile report. Delays in reporting from districts regarding program coverage and patient care are major contributing factors. Specifically, in Southeast Sulawesi Province, the health profile is often accessible only a year after the report is completed, whereas it should ideally be available within three months (Sanjaya, 2011). Moreover, medical record science or hospital administration expertise is not present in all healthcare facilities. In Indonesia, there are only 11 diploma-level hospital administration programs (D3), 3 Master's programs, and 59 undergraduate-level programs in hospital administration. Furthermore, there are only 26 diploma-level programs in medical records (D3) and one undergraduate-level program in medical records. Consequently, there is a shortage of healthcare workers with specialized training in medical record management, with many healthcare centers relying on personnel from other fields to manage these services (Herlambang et al., 2018).

The delay in the reporting of health profiles at both the city and provincial district health offices is often due to slow reporting from health centers and primary healthcare facilities, which may not submit timely reports, including medical record recapitulation data. Medical record services at the health center level are still considered insufficient, as reflected in the unsatisfactory performance indicators for input, process, output, and outcomes. An initial survey conducted at several health centers in Konawe District revealed that visitor satisfaction did not exceed 80%, with medical record processing times exceeding 15 minutes. Additionally, several health center heads reported incomplete consent forms and unclear patient data in the medical records. Medical records serve as a fundamental tool for disease analysis, treatment planning, and ensuring the continuous and efficient delivery of healthcare services. According to Ministry of Health Regulation No. 269 of 2008, Article 13, paragraph 1, medical records are vital documents that contain healthcare information, disease analysis, and plans for ongoing patient treatment (Kholili, 2011; Siswati & Maryati, 2017).

## Method

### Study design

This study employs a quantitative research design using a Cross-Sectional Study approach. This design involves the systematic collection, analysis, and description of data to enhance the understanding of specific phenomena. Cross-sectional studies are advantageous in providing a snapshot of a population at a particular point in time without requiring prolonged observation (Ramdhani, 2017).

## Sample

The research was conducted from August to September 2021 at the Konawe District Health Center, which includes a total of 29 health centers. The sampling method used in this study was Simple Random Sampling, with a total sample of 124 respondents. The procedure for simple random sampling involved creating a sampling frame a list containing sequential numbers for the sampling units to be observed determining the sample size, and selecting initial random numbers using a random number table.

## Inclusion and Exclusion Criteria

The criteria for selecting participants are as follows Inclusion Criteria: Health workers on duty at the district health center; willingness to participate as respondents; a work experience of more than 2 years (indicating both the quality and quantity of work experience). Exclusion Criteria: individuals who are not health workers on duty at the district health center; individuals who are unwilling to participate as respondents; health workers with less than 2 years of work experience.

## Sources of Data

The data types and sources in this study include: primary data. Data collected directly from respondents using research instruments, in the form of questionnaires distributed to participants. And secondary data, data obtained from various literature sources and documents from the research site. This includes books, government statistical publications, related journals, and government documents, such as Health Profiles (Sugiyono, 2016).

## Data Collection

The research instrument used is a pre-prepared questionnaire. Validity and reliability tests are conducted to ensure the feasibility of the instrument. The dependent and independent variables are presented in distribution tables, accompanied by interpretations. Inferential analysis employs the Chi-square test to assess the significance of comparative hypotheses involving independent samples (two unpaired samples). This test examines whether there is an association between two variables. If the variables are independent, the probability of a particular outcome for one variable is not influenced by the other. The Chi-square test is performed using the SPSS application.

## Results

This study analyzes the relationship between financial factors, human resources factors, time factors, organizational factors, and infrastructure factors in the implementation of medical records at the Konawe District Health Center, which can be seen in the following table:

**Table 1** Relationship between Financial, Human Resources Factors implementation of Medical Records

| Variable        | Medical Record Implementation |       |            |       | Σ  | %     | Statistic Analysis                                            |
|-----------------|-------------------------------|-------|------------|-------|----|-------|---------------------------------------------------------------|
|                 | Good                          |       | Not enough |       |    |       |                                                               |
|                 | f                             | %     | f          | %     |    |       |                                                               |
| Financial       |                               |       |            |       |    |       |                                                               |
| Good            | 15                            | 57.69 | 11         | 42.31 | 26 | 100.0 | X <sup>2</sup> count = 13.417<br>X <sup>2</sup> table = 3.841 |
| Not enough      | 7                             | 14.29 | 42         | 85.71 | 49 | 100.0 | Φ = 0.454                                                     |
| Human Resources |                               |       |            |       |    |       |                                                               |
| Good            | 17                            | 73.91 | 6          | 26.09 | 23 | 100.0 | X <sup>2</sup> count = 28.778<br>X <sup>2</sup> table = 3.841 |
| Not enough      | 5                             | 9.62  | 47         | 90.38 | 52 | 100.0 | Φ = 0.651                                                     |

The table 1, it can be explained that the financial factor is good of 49 respondents but in implementing medical records with good category amounted to 15 respondents (57.69%) and less amounted to 11 (42.31%). Furthermore, the Financial Factor Less than 26 respondents and in the implementation of records the good category amounted to 7 (14.29%) and factors financially with less implementation of medical records totaling 42 respondents (85.71%)It is known from the Chi-Square test results and obtained the X<sup>2</sup>countis13.417< X<sup>2</sup>table is 3.841 and Phi value of 0.454, which means it has a moderate relationship between financial factors and record implementation medical. Furthermore, the human resources factor was less tan 52 respondents and in implementing medical records in good category amounted to 5 respondents (9.62%) and the human resources factors with the implementation of medical records less amounted to 49(90.38%). Chi-square test results obtained the X<sup>2</sup>count is 28.778< X<sup>2</sup>table is

3.841 and Phi value of 0.651, which means it has a strong relationship between the human resources factor with the implementation of medical records.

**Table 2** Relationship between Time, Organizational Factors, InfrastructureFactor with Implementation of Medical Records

| Medical Records |                               |       |            |       |    |       |                               |
|-----------------|-------------------------------|-------|------------|-------|----|-------|-------------------------------|
| Variable        | Medical Record Implementation |       |            |       | Σ  | %     | Statistic Analysis            |
|                 | Good                          |       | Not enough |       |    |       |                               |
|                 | f                             | %     | f          | %     |    |       |                               |
| Time            |                               |       |            |       |    |       | X <sup>2</sup> count = 10.438 |
| Good            | 12                            | 60.00 | 8          | 40.00 | 20 | 100.0 | X <sup>2</sup> table = 3.841  |
| Not enough      | 10                            | 18.18 | 45         | 81.82 | 55 | 100.0 | Φ = 0.406                     |
| Organizational  |                               |       |            |       |    |       | X <sup>2</sup> count = 10.438 |
| Good            | 17                            | 62.96 | 10         | 37.04 | 27 | 100.0 | X <sup>2</sup> table = 3.841  |
| Not enough      | 5                             | 10.42 | 43         | 89.58 | 48 | 100.0 | Φ = 0.406                     |
| Infrastructure  |                               |       |            |       |    |       | X <sup>2</sup> count = 25,322 |
| Good            | 17                            | 68.00 | 8          | 32.00 | 25 | 100.0 | X <sup>2</sup> table = 3.841  |
| Not enough      | 5                             | 10.00 | 45         | 90.00 | 50 | 100.0 | Φ = 0.601                     |

The table 2, it can be explained that the time factor is good of 55 respondents but in implementing medical records with good categories totaling 12 respondents (60.00%) and less amounting to 8 (40.00%). Furthermore, the time factor is less of 20 respondents, and the implementation of medical records in the good category amounted to 10 (18.18%) and the time factor was less with the implementation of medical records than 45 respondents (81.82%). The results of the Chi-square test and obtained the  $X^2_{\text{Count}}$  is  $10.438 < X^2_{\text{table}}$  is 3.841 and Phi value 0.406, which means it has a moderate relationship between time factor with the implementation of medical records. Furthermore, Factor Organization Less than 48 respondents and within the implementation of medical records in the good category amounted to 5 respondents (10.42%) and organizational factors less with the implementation of medical records are less than 43 (89.58%). The results of the Chi-square test and obtained the  $X^2_{\text{Count}}$  20.552  $< X^2_{\text{table}}$  is 3.841 and Phi value 0.554, which means it has a moderate relationship. Factor Infrastructure Less than 50 respondents, and the within implementation of medical records in the good category amounted to 6 respondents (10.00%) and the infrastructure factor is less than the implementation of medical records less than 45 (90.00%). Chi-square test results obtained the value of  $X^2_{\text{Count}}$  is 24.322  $< X^2_{\text{table}}$  is 3.841 and Phi value of 0.601, which means it has a strong relationship between infrastructure factor with the implementation of medical records.

## Discussion

Every medical examination, whether it is a physical examination by a doctor, supporting medical tests (laboratory, radiology, and medical rehabilitation), diagnostics, or treatment, carries a cost that must be incurred. These services are an inherent right of the doctor (Handiwidjojo, 2009). A computer-based hospital information system, such as an electronic medical record (EMR), is essential for hospitals in the era of globalization. However, developing an integrated computer-based information system requires considerable effort and financial investment (Handiwidjojo, 2009)

A computer-based record, specifically an electronic patient record system, is designed to support users by providing access to comprehensive and accurate data, alerts, reminders, clinical decision support systems, knowledge links, and more (Handiwidjojo, 2009). The advantages of this system include the assurance of data completeness and accuracy, as well as rapid data access. However, its disadvantages include potential security vulnerabilities and the substantial costs required for implementation (Sanjoyo, 2007). The implementation of an electronic medical record system provides several benefits, including: Enabling quick, easy, and remote access; Organizing information more effectively and making it easier to read compared to paper records; Facilitating simultaneous access; Enhancing the efficiency of processes such as data collection, management, and retrieval; Increasing the completeness of health medical records by up to 80%; Improving the quality of information, particularly billing and cost data, and boosting institutional revenue; Enhancing resource utilization; Improving the patient care model through better documentation of medical records; Encouraging professional personnel to create standards, enforce relevant regulations, policies, laws, and ethics, and improve service quality; Serving as a monitoring model (Handiwidjojo, 2009; Triyati & Weningsih, 2018). In organizational competition, resources must be

formidable. The resources required to operate an organization or company should not be viewed in isolation, but as a cohesive unit that forms a synergy (Bukit et al., 2017; Oktayani, 2018).

A medical recorder is an individual who has completed formal education in medical records and health information. According to Minister of Health Regulation No. 55 of 2013, a medical recorder is someone who has passed the required education in medical records and health information in accordance with the applicable laws (Peraturan Menteri Kesehatan RI, 2013; Napirah et al., 2016).

Intangible resources include: The technology used by an organization should enhance efficiency and provide value to customers beyond competitors' offerings; The organization's ability to bring ideas to the market, how long it takes, and whether the innovation adds value for both the customer and the company; The perception and trust of stakeholders toward the organization, which plays a critical role in its competitive success. Medical records and health information systems manage the quality of healthcare information and leverage health statistics for biomedical research and quality management purposes, including: Creating healthcare statistics; Managing quality and performance improvement; Utilizing health statistics for research.

A Health Information System (HIS) aids in decision-making by: facilitating daily health service operations; enabling rapid intervention to address health issues, and; supporting health management at the district/city, provincial, and central levels, particularly in the development of short-term, medium-term, and long-term plans. A good HIS produces accurate and timely data/information (Ali et al., 2018). HIS has been implemented to support daily health service activities in healthcare facilities, such as health centers and hospitals, particularly in-patient care and interventions to address health problems (Widayatun & Fatoni, 2013). However, in terms of health management at district/city, provincial, and central levels, HIS has not played a significant role due to the lack of accurate and timely data/information. One contributing factor is the mismatch between the limited time and the large number of patients, leading to incomplete medical records (Kemenkes RI, 2016).

The use of electronic medical records (EMRs) can have both positive and negative effects on the doctor-patient relationship. Some studies suggest that EMRs may negatively impact doctor-patient communication, as doctors may become too focused on the screen when filling out records, potentially disrupting interaction. However, EMRs also offer benefits, such as facilitating integrated services (Sitanggang, 2017).

In general, it takes longer to complete electronic medical records compared to manual records. Research conducted by medical record storage officers, who are responsible for receiving, storing, managing, maintaining, and serving medical record requests, indicates that the number of staff needed in the storage department depends on the workload (Handiwidjojo, 2009). The process begins when the patient registers at the registration section. The clerk enters the patient's number, and a tracer is automatically printed, along with the polyclinic serial number. The filing officer can then access the patient data for treatment and prepare the medical record file. The patient is directed to wait in the polyclinic, and distribution officers deliver medical records to the appropriate polyclinic. According to Minister of Health Regulation No. 129/Menkes/SK/II/2008, the time required for providing medical records is 10 minutes for outpatient care and 15 minutes for inpatient care (Triyati & Weningsih, 2018).

The organizational component evaluates the system in terms of organizational structure and environment. Organizational structure includes type, culture, politics, hierarchy, planning, control systems, strategy, management, and communication (Ulfa, 2018). Leadership support from top management and staff is crucial for the success of the system. The organizational environment involves resources, government, politics, competition, inter-organizational relations, and communication. The technology component focuses on system quality, information quality, and service quality (Raharjo et al., 2016).

The medical record and health information unit must be supported by resources, including human resources, finances, materials, methods, and technology, to achieve its goals. The most challenging aspect is managing human resources, as individuals have diverse needs and desires (Ulfa, 2018). Without sufficient resources, an organization cannot function as intended. The success of medical record management relies on professional personnel and the proper allocation of resources (Wiryadi, 2016). Marketing is crucial for the success of the medical records and health information unit. It involves producing and utilizing health data and information. Several studies have identified factors influencing the successful implementation of hospital information systems (Siswati, 2018). By considering critical success factors—such as business relevance, user education, senior management support, proactive planning, system availability, customer satisfaction, continuous quality improvement programs, and post-implementation audits—better implementation of electronic medical records can be achieved (Tampubolon, 2020).

The quality of health information systems involves the interplay of system features, including performance and user interface. Factors such as ease of use, learning curve, response time, usefulness, availability, flexibility, and security are essential for assessing system quality. The measure of success or failure in the application of electronic medical records depends on administrative, technical, user, and functional aspects, with organizational factors playing a key role. System aging can also contribute to failure (Pratama & Darnoto, 2017).

A complete medical record offers numerous benefits, including assisting in coordination, providing information, and facilitating communication within multidisciplinary teams. This infrastructure places great importance on the relationship between the human, organizational, and technological components of the information system. The human component assesses system use based on frequency, breadth of functionality, and user satisfaction (Pamugar et al., 2014). Medical records should be objective, detailing patient identity, actions, and statements that lead the doctor to a diagnosis. Additionally, documentation should include non-compliance or failure to follow advice, take medications, or request consultations, which could contribute to delays in medical treatment (Suprpta et al., 2006; Ulfa, Sitti Marya, 2022).

## Conclusion

This research can be concluded that there is significant relationship between financial factors, human resource factors, time factor, organizational factors, and infrastructure factors with the implementation of medical records.

## Declaration Conflicting Interest

The authors declare no conflict of interest.

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## Author Contribution

Data curation, formal analysis, funding acquisition, investigation, methodology, project administration, **NR**; Conceptualization, project administration, resources, software, **S**; Conceptualization, supervision; validation, **LOS**; Conceptualization, Data curation, Methodology, Validation, Visualization, Writing - Review & Editing, **EAJ**; Roles/Writing - original draft, editing, **SMU,TH**.

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