

An Analysis of Electronic Medical Record Implementation at RSUD Tais, Seluma Regency In 2025

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ABSTRACT

Seluma Regency ranks 5th out of 10 regencies/cities, with 31.76% of health care facilities (fasyankes) connected to the Electronic Medical Record (EMR) system. The implementation of EMR still faces various obstacles, such as low compliance and knowledge among officers, limited infrastructure, and suboptimal budget support. The study aims to analyze the factors that influence the implementation of EMR, including staff compliance and knowledge, changes in governance, supporting facilities, and budgetary support. The method used is an analytical research design with a mixed-method approach. Data was collected by distributing questionnaires to 30 respondents consisting of health workers and management of the Seluma District General Hospital using stratified random sampling. This was clarified with a qualitative approach and field observations. The integrated results show that although statistically the variables are not significant, in practical terms, increasing staff knowledge through structured training, providing adequate technological facilities, and strengthening management commitment are seen as strategic steps to improve the achievement of RME implementation. Regular training, structured supervision, and strengthening of facilities and budgets to support RME implementation are recommended. Change management needs to be designed systematically with improved data connectivity. Further research on a larger scale is recommended to strengthen the findings.

INTRODUCTION

Digitalization plays a crucial role in enhancing the quality and accessibility of healthcare services, supporting clinical decision-making, patient-provider interactions, and access in remote areas (Adha et al., 2023). Digital applications facilitate online consultations, medicine ordering, and information access without physical visits (Ikawati, 2024). Integrated information systems reduce medical errors (Pongtambing et al., 2024) and promote telemedicine adoption. However, challenges such as user resistance and digital gaps require multi-stakeholder collaboration (Pusparani et al., 2018). Digitalization is not just a trend but a strategy requiring continuous support (Maryati & Utami, 2023).

A key aspect of healthcare digitalization is Electronic Medical Records (EMR), which enhances data accuracy and streamlines administration and clinical decision-making (Iskandar & Anjani, 2024; Yuniar et al., 2022). According to Indonesian Ministry of Health Regulation No. 269/MENKES/PER/III/2008, medical records document patient identity, examinations, treatments, and medical actions. EMRs, as defined by the CMS, include demographics, medical history, therapies, lab results, and radiology reports (Asriani, 2023). The Satusehat-integrated EMR system improves service efficiency, allowing healthcare providers to access patient data across facilities. Indicators of implementation include registered facilities, API integration status, and data connectivity. Satusehat development, led by the Digital Transformation Office, involved planning, expert consultation, and trials with hospitals, laboratories, health-tech, pharmacies, clinics, and academia. Currently, 792 hospitals and primary healthcare centers are connected to Satusehat.

The Indonesian Ministry of Health mandates all healthcare facilities to implement Electronic Medical Records (EMR) under Minister of Health Regulation No. 24 of 2022. This regulation aims to improve health information management, accelerate data access, and strengthen coordination among healthcare facilities. It governs EMR storage, security, and data protection, requiring facilities to provide access to the Ministry. Oversight is conducted by the minister, governors, or local heads, with administrative sanctions including warnings, accreditation revocation, or business license suspension for non compliance or failure to integrate EMR with Satusehat by July 31, 2024.

According to Satusehat data, Bengkulu Province ranks 18th of 38 provinces in facility connectivity to the platform. Of 1,242 healthcare facilities, 373 have implemented EMR, achieving 30.03% connectivity: 77 clinics (54.61%), 1 laboratory (12.5%), 157 primary healthcare centers (87.71%), 26 hospitals (100%), and 112 private practices (25.75%), while pharmacies and blood

transfusion units have not implemented EMR. In Seluma Regency, ranked 5th of 10 districts/cities as of March 2024, 27 facilities (31.76%) are connected, including 1 hospital (100%), 22 primary healthcare centers (100%), 3 private practices (12.5%), and 1 clinic (16.67%). As of December 2024, EMR utilization at Tais Regional General Hospital reached only 36%. The implementation of Electronic Medical Records (EMR) in healthcare facilities aims to improve service quality. Traditionally, medical records were paper-based, but EMR enables rapid access for healthcare providers, accelerating clinical decisions, diagnosis, and patient care. In emergencies, access to medical history can save lives, while automated reminders support timely treatment (Pusparani et al., 2018). EMR also optimizes care processes, enhances coordination, and reduces medical errors (Ikawati, 2024). However, challenges remain, including human resource readiness (Siswati et al., 2024) and data security and interoperability issues, such as cyberattacks and privacy breaches due to vendor involvement (Adha et al., 2023).

Studies show that education, experience, knowledge, and perception significantly affect healthcare workers' readiness to adopt EMR, though professional unit functions are not always considered (Siswati et al., 2024). Other research has not fully addressed organizational support, staff engagement, or management-level involvement in EMR implementation (Rusdiana, 2024; Asti et al., 2024; Wahyudi & Wahab, 2024). User implementation level remains a key indicator of EMR effectiveness, reflecting how well the system meets users' needs and expectations, but barriers to optimal utilization persist. Tais Regional General Hospital initiated an integrated RME with SIMRS in 2023 as part of its digital transformation in accordance with Ministry of Health regulations. The results of RME implementation in Tais Regional General Hospital service units are quickly known in the form of data on the 10 most common diseases each month. Data for 2024 shows Dengue Hemorrhagic Fever as the most common case with 315 patients (147 male, 170 female). Observation for other suspected diseases and conditions ranks second with 111 cases (46 male, 63 female), causing two deaths in male patients.

RESEARCH METHODS

This study employs a sequential explanatory mixed-methods design, starting with quantitative data collection and analysis, followed by qualitative data through observation and interviews (Pane & Hadju, 2022). The research focuses on EMR implementation, staff knowledge, compliance, operational governance, supporting facilities, and budget. The mixed-methods approach allows measurement of implementation success quantitatively while exploring healthcare workers' perceptions, experiences, and challenges for a comprehensive understanding (Sugiyono, 2013). This research was conducted at Tais Regional General Hospital. The research period was three months from the time the proposal was approved.

The study population included all healthcare and administrative staff at Tais Regional General Hospital involved in EMR implementation. In Phase 1, a sample of 42 medical staff directly using EMR was selected using stratified random sampling to represent different hospital units. Sample size was calculated using Slovin's formula with a 10% margin of error (Gustiani Pakendek, 2018). This study used questionnaires to collect data on EMR implementation, measuring variables such as staff compliance, user knowledge, operational governance, supporting facilities, and budget.

This study evaluated EMR implementation using both primary and secondary data. Primary data were collected through field observations with a checklist based on Ministry of Health Regulation No. 24/2022 and semi-structured interviews with healthcare staff (Fauziah & Fadly, 2023). Secondary data were obtained via online questionnaires using stratified random sampling, targeting medical records officers, nurses, doctors, and management staff (Rusdiana, 2024). Quantitative data were analyzed using percentage scores and ordinal logistic regression to assess staff compliance, knowledge, operational governance, supporting facilities, and budget (Wahyudi & Wahab, 2024). Qualitative data from interviews were analyzed thematically to explore experiences and challenges, complementing the quantitative results. The sequential explanatory mixed-methods design allowed integration of both data types, enhancing understanding and validity (Sugiyono, 2013).

RESULTS

Measurement of Implementation Level

The tabulated maximum and total scores (Appendix 18) show the percentage categories of the variables tested, as presented in Figure 1. The calculation for the Implementation variable (Y) is as follows:

$$\text{Implementation Level (\%), Score Percentage} = \left(\frac{\text{Total Score}}{\text{Maximum Score}} \right) \times 100 \%$$

$$\left(\frac{\text{Total Score}}{\text{Maximum Score}} \right) \times 100 \% = \left(\frac{924}{1200} \right) \times 100 \% = 77,0 \%$$

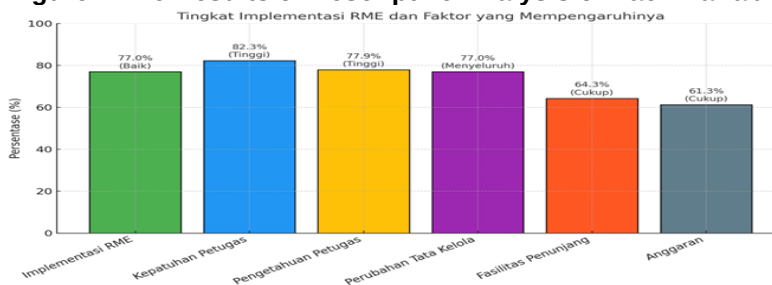
Note:

Total Score for the Implementation variable Y (based on tabulated results)

Maximum Score = 8 (sub-questions) × 5 (Likert scale levels) × 30 (total respondents)

The same calculation method was applied to the independent variables X1, X2, X3, X4, and X5, as shown in Figure 1.

Figure 1 The Results of Descriptive Analysis of Each Variable



Source: Processed Data, 2025

Based on figure 1, the analysis shows that the overall EMR implementation level is good (77.0%), indicating that the system is fairly well utilized in healthcare services, though still with room for improvement. Staff compliance and knowledge are high (82.3% and 77.9%), reflecting adequate human resource readiness and understanding of EMR processes. Governance and operational changes are also at a good level (77.0%), demonstrating managerial and structural commitment to adapting workflows. Supporting facilities (64.3%) and budget allocation (61.3%) are rated as adequate, highlighting infrastructure and funding limitations that may hinder optimal system performance.

Instrument Testing Results

Validity was assessed using item-total correlation with SPSS 22, based on Pearson Product Moment. Each item was considered valid if the correlation coefficient ($r \geq 0.361$ ($N = 30$)) and significant at a 95% confidence level ($p < 0.05$). All questionnaire items exceeded the threshold and were significant, indicating that the instruments are valid for further analysis.

Table 1. Reliability Test Results

Variabel	Cronbach Alpha	Desc
Y	0,839	reliabel
X1	0,975	reliabel
X2	0,966	reliabel
X3	0,969	reliabel
X4	0,948	reliabel
X5	0,973	reliabel

Source: Processed Data, 2025

Reliability was tested using Cronbach's Alpha in SPSS 22. A value of $\alpha \geq 0.70$ was considered acceptable. All variables showed high reliability: $Y = 0.839$, $X1 = 0.975$, $X2 = 0.966$, $X3 = 0.969$, $X4 = 0.948$, $X5 = 0.973$, demonstrating very high internal consistency.

In conclusion, the questionnaire items are both valid and reliable, making the instruments suitable for further analysis, including ordinal logistic regression to test hypotheses and answer research questions.

DISCUSSION

Staff Compliance in EMR Implementation at RSUD Tais, Seluma

Descriptive analysis showed a high level of staff compliance (82.3% rated as "good"), but ordinal logistic regression indicated no statistically significant effect on EMR implementation ($p = 0.919$). Interviews revealed that compliance is primarily administrative and varies across units, with input responsibilities concentrated on a few staff, leading to delays and uneven documentation. This

discrepancy between quantitative and qualitative findings may result from the homogeneous distribution of compliance among respondents (Siswati et al., 2024). Overall, EMR effectiveness is influenced not only by staff compliance but also by infrastructure availability and internal supervision, consistent with previous findings in other hospitals (Fauziah & Fadly, 2023).

Staff Knowledge in EMR Implementation at RSUD Tais, Seluma

Descriptive analysis indicated that staff knowledge was generally high (77.9% rated as “good”), but ordinal logistic regression showed no statistically significant effect on EMR implementation ($p = 0.610$). Interviews revealed that while staff understood the purpose and benefits of EMR, not all were proficient in data entry procedures. These findings suggest that high knowledge alone does not guarantee successful implementation, as factors such as technical training, infrastructure support, and change management also play critical roles. Previous studies confirm that knowledge is important but insufficient without proper supervision, user-friendly systems, and supportive organizational culture (Novana et al., 2024; Wongso et al., 2023).

Governance and Operational Changes in EMR Implementation at RSUD Tais, Seluma

Descriptive analysis showed that 77.0% of respondents perceived governance and operational changes as comprehensive, indicating managerial commitment and workflow restructuring for digitalization. However, ordinal logistic regression showed no statistically significant effect ($p = 0.400$). Field observations revealed the absence of specific written SOPs for EMR use at the operational level, causing staff to rely on prior experience or initiative, which may reduce consistency and effectiveness. Interviews confirmed that SOPs are not fully aligned with digital systems, and legacy workflows are still used in parallel. These findings highlight a gap between managerial policy support and technical implementation, emphasizing that successful EMR adoption requires not only infrastructure and training but also clear written SOPs to guide daily operations and inter-unit coordination (Siswati et al., 2024; Faida & Ali, 2021).

Supporting Facilities in EMR Implementation at RSUD Tais, Seluma

Descriptive analysis indicated that supporting facilities were rated “adequate” (64.3%), but ordinal logistic regression showed no statistically significant effect on EMR implementation ($p = 0.492$). Field observations revealed gaps such as outdated computers, unstable internet, and inconsistent electricity, which hinder smooth electronic data entry. Interviews confirmed that infrastructure limitations, especially during peak hours or in certain units, directly affect EMR performance. These findings align with previous studies emphasizing that adequate hardware and network connectivity are crucial for successful EMR implementation, as training alone cannot overcome infrastructure deficiencies (Faida & Ali, 2021; Maryati & Utami, 2023; Sari et al., 2021).

Budget Support in EMR Implementation at RSUD Tais, Seluma

Descriptive analysis showed that budget availability was rated “adequate” (61.3%), but ordinal logistic regression indicated no statistically significant effect on EMR implementation ($p = 0.534$). Observations revealed that budget allocations do not specifically cover system upgrades, ongoing training, hardware/software procurement, or internet maintenance, limiting sustainable EMR operations. Interviews confirmed that while proposals exist for additional resources, implementation is constrained by budget limitations, with RME development not prioritized in financial planning. These findings align with prior studies emphasizing that adequate and structured financial support is crucial for effective EMR adoption and long-term sustainability (Faida & Ali, 2021; Adha et al., 2023).

Factors Affecting EMR Implementation Effectiveness at RSUD Tais, Seluma

The effectiveness of EMR implementation is influenced by three main aspects: human resources, infrastructure, and operational systems.

1. **Human Resources:** Staff compliance (82.3%) and knowledge (77.9%) were high but not statistically significant, indicating that formal adherence and general understanding alone are insufficient without deeper training and behavioral control.
2. **Infrastructure:** Supporting facilities (64.3%) were adequate, but limitations such as insufficient computers, unstable internet, and inconsistent electricity hinder smooth system use.
3. **Operational Systems and Organization:** Governance changes were recognized by 77% of respondents, yet written SOPs at the operational level are lacking. Budget support (61.3%) is also limited, with no dedicated allocation for training, system maintenance, or technology updates.

Integrated Findings of EMR Implementation at RSUD Tais

This study integrated quantitative and qualitative data using a sequential explanatory mixed-methods design. Quantitative analysis found no statistically significant effects of staff compliance, knowledge, governance and operational changes, supporting facilities, or budget on EMR effectiveness. These results prompted qualitative exploration to understand the underlying factors. Interviews revealed that, despite generally positive perceptions in the survey, EMR implementation was uneven across units, with some staff relying on manual records. Key barriers included system support, work culture, internal supervision, limited training, technical issues, and incomplete SOPs. Thus, while quantitative data reflect overall trends, qualitative findings uncover contextual, cultural, and operational factors that significantly affect EMR implementation.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. **EMR Implementation:** EMR usage varies across units, with overall system utilization reaching around 36% by the end of 2024. Some units consistently use electronic input, while others still rely on manual methods.
2. **Influencing Factors:** Quantitative analysis showed no statistically significant effects of staff compliance, knowledge, governance and operational changes, supporting facilities, or budget. However, qualitative findings indicated that staff knowledge and supporting facilities most strongly affect effectiveness, followed by budget support and governance changes.
3. **Key Challenges:** Main barriers include limited specialized training, incomplete integration of services, insufficient devices and unstable internet in some units, and constrained budget allocations.
4. **Integration of Findings:** Despite non-significant statistical results, practical strategies such as structured staff training, adequate technological facilities, and strengthened managerial commitment are essential to improve EMR implementation at RSUD Tais.

Recommendations

1. **Hospital Management**
It is recommended that hospital management develop and socialize comprehensive SOPs for EMR implementation across all service units. Staff should receive structured and official training to improve competence in using the system. Regular supervision and evaluation of EMR data entry are necessary to ensure equitable distribution of workload among staff. Additionally, units that share resources should be provided with more computers, and internal internet stability should be improved to support smooth system operation.
2. **Local Government and Health Office**
Local government and health authorities should allocate dedicated budgets for the development of the EMR system. This includes funding for staff training, software updates, hardware procurement, and ongoing maintenance to ensure sustainable and effective implementation.
3. **Future Research**
Future studies are encouraged to employ a full mixed-methods approach with advanced statistical analyses, such as mediation and moderation tests. Expanding the research area to include other healthcare facilities in Bengkulu Province or nationally would enhance the generalizability of findings and provide a broader understanding of EMR implementation challenges and best practices.

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