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Factors Influencing the Effectiveness of Electronic Medical Record Implementation

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Abstract

Background: Advances in information technology have brought significant changes to healthcare systems, one of which is through the implementation of Electronic Medical Records. Electronic Medical Records (EMR) are an important component in improving the quality of healthcare services to be effective, efficient, and sustainable. However, the success of its implementation is greatly influenced by various organizational and individual factors. This study aims to analyze the factors that influence the effectiveness of Electronic Medical Record usage at Dungus Regional General Hospital. **Method :** This study used a quantitative approach with a cross-sectional design. Data collection was conducted using a structured questionnaire administered to 143 respondents consisting of doctors, nurses, medical record staff, and other health workers using proportional random sampling. The independent variables included perceived usefulness, perceived ease of use, management support, training attended, and availability of supporting infrastructure. The dependent variable was the use of EMR. Data analysis was perfoEMRd using descriptive statistics, classical assumption tests (normality, multicollinearity, and heteroscedasticity), and multiple linear regression tests. **Results:** The results show that management support is the most dominant factor influencing the effectiveness of EMR use ($p = 0.031$), followed by perceived ease of use ($p = 0.039$), perceived usefulness ($p = 0.044$), training attended ($p = 0.044$), and availability of supporting infrastructure ($p = 0.044$). The coefficient of determination (R^2) value of 0.621 indicates that 61.7% of the effectiveness of EMR use can be explained by these five variables. This means that the effectiveness of EMR use at Dungus Regional General Hospital is significantly influenced by individual, organizational, and technological factors. **Conclusion:** This study concludes that perceived usefulness, perceived ease of use, management support, training, and supporting infrastructure significantly and jointly influence EMR effectiveness at Dungus Hospital ($R^2 = 0.621$; $p = 0.000$), with management support emerging as the most dominant factor in ensuring effective, optimal, and sustainable EMR implementation.

Keywords: Electronic Medical Records, Effectiveness of Use, Management Support, Training, Infrastructure

1. Introduction

Healthcare facilities are institutions that provide healthcare services to the public and are required to adopt information technology to improve the effectiveness and efficiency of their services. One form of digitization in the healthcare sector is the implementation of Electronic Medical Records (EMR). The optimal implementation of EMR is expected to support the success of government programs in improving the quality of healthcare services (Hapsari & Mubarokah, 2023).

EMR systems are not only developing in developed countries, but also in developing countries as an effort to improve the effectiveness and efficiency of health services. Although developing countries still face challenges in controlling infectious diseases and infections, EMR systems remain a necessity to ensure smooth access to more accurate and faster medical information (Tilaar & Sewu, 2023). In Indonesia, regulations governing the implementation of EMR are still limited, despite support from the 2008 Electronic Information and Transaction Law (ITE Law) and Minister of Health Regulation No. 24 of 2022, which provide a legal basis for the use of EMR in healthcare facilities.

Advances in information and communication technology have brought significant changes to healthcare systems, including medical record management. However, EMR implementation is not without challenges. Studies show that the readiness of healthcare facilities to implement EMR is a crucial factor before implementation. This readiness assessment includes identifying processes, prioritizing, and establishing operational functions to support the optimization of EMR implementation (Faida & Ali, 2021). This readiness also involves health workers, including doctors, medical record officers, and patients as users of the health information system.

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Compared to several developed countries such as the United States, which has implemented EMR since 1999, the United Kingdom since 2000, and New Zealand since 2002, Indonesia still lags behind in the digitization of medical records (Faida & Ali, 2021). However, global trends show that EMR can improve the quality of healthcare services, including in terms of patient safety. The main advantages of EMR include improved data integrity and accuracy, cost efficiency, and better access to patient information. However, its implementation still faces obstacles such as inadequate infrastructure, limitations in information technology, lack of needs assessment, and high costs for software and hardware procurement (Sudirahayu & Harjoko, 2017).

Overall, the implementation of EMR in Indonesia still faces various challenges, as seen in several hospitals in Yogyakarta. Studies show that the implementation of Hospital Management Information Systems (SIMRS) integrated with EMR has not been optimal due to poor planning (Ningsih et al., 2022). Therefore, evaluating the readiness of healthcare facilities to adopt EMR technology is a strategic step that needs to be taken prior to implementation. One effective method for assessing EMR readiness is through the Electronic Health Record (EHR) Readiness Assessment, developed by the Healthcare Information and Management Systems Society (HIMSS) (Arianti et al., 2024).

A study conducted by Amelia (2018), shows that information technology has many advantages over manual paper-based record systems in terms of storing and retrieving patient data. However, EMR implementation still faces challenges such as infrastructure limitations, technical issues, and cultural and cost constraints. Therefore, it is important to conduct a comprehensive readiness assessment before implementing EMR in healthcare facilities to ensure the success of Indonesia's digital health transformation.

One important factor that influences technology acceptance is perceived usefulness, which is the extent to which users believe that using EMR can improve their performance. The higher the perceived usefulness, the greater the tendency for healthcare workers to use the system consistently (Davis, 1989; Kim et al., 2021). In addition, perceived ease of use also has a significant effect on a person's attitude and intention to use the system. If healthcare workers feel that EMR is easy to operate without requiring excessive effort, then the level of adoption and completeness of its use will increase (Alasmari et al., 2022).

Hospital management support also plays a strategic role in ensuring the successful implementation of EMR. This support includes providing policies, supervision, motivation, and adequate resource allocation so that healthcare workers can optimally implement electronic recording. Several studies show that without strong commitment and support from management, EMR systems tend to be ineffective (Susanto et al., 2023).

In addition, training that healthcare workers have undergone is a determining factor in their EMR competency. Targeted and ongoing training can improve healthcare workers' ability to operate the system, understand its features, and minimize data entry errors (Amin et al., 2021). Without adequate training, users tend to experience difficulties, which can reduce the accuracy and completeness of medical record data.

The last factor that is no less important is the availability of supporting infrastructure, such as internet networks, computers, servers, and data security systems. Inadequate infrastructure can hinder access, slow down data input speeds, and reduce EMR user satisfaction. Therefore, complete infrastructure is an important prerequisite for the successful implementation of electronic systems in hospitals (Rahman & Dewi, 2024).

Dungus Regional General Hospital was chosen as the research location because it is a referral hospital with a wide range of services and plays a strategic role in supporting health services in the Madiun Regency and surrounding areas. In addition, this hospital has begun to adopt an EMR system, but still faces various challenges in its implementation. Dungus Regional General Hospital began implementing electronic medical records in July 2024, but there are still many obstacles to its implementation. One of these obstacles, as seen in the Medical Record Completion Report (KLPCM), is the incomplete filling out of electronic medical records. Therefore, this study will provide a clearer picture of the readiness of Dungus Regional General Hospital in adopting EMR and the factors that influence its success. The use of EMR at Dungus Regional General Hospital in 2024 is only 30% complete.

This research is important given the urgency of implementing EMR as part of the digitization of Indonesia's healthcare system. By analyzing the effectiveness of electronic medical record implementation at Dungus Regional General Hospital, this study aims to provide an overview of the extent to which this system supports improvements in hospital service quality, as well as to identify obstacles that still need to be overcome in its implementation. The results of this study are expected to contribute to policymakers, health facility managers, and medical personnel in developing better strategies for accelerating the comprehensive and sustainable implementation of EMR.

2. Materials and Methods

This study employed a quantitative analytic design using a cross-sectional approach to examine factors influencing the effectiveness of Electronic Medical Records (EMR) at Dungus Regional General Hospital. Data were collected at a single point in time to assess the relationships between independent variables and EMR effectiveness. The study population consisted of healthcare professionals working at Dungus Regional General Hospital, including doctors, nurses, midwives, medical record officers, pharmacists, nutritionists, physiotherapists, radiographers, and laboratory analysts. A total of 143 respondents were selected using proportional random sampling. The sample size was determined using the Slovin formula to ensure adequate

representation of the study population. The independent variables included perceived usefulness, perceived ease of use, management support, participation in training, and availability of supporting infrastructure for EMR implementation. The dependent variable was the effectiveness of EMR utilization. Data were collected using a structured questionnaire that had undergone validity and reliability testing prior to data collection. Bivariate analysis was conducted using Pearson's product-moment correlation to examine the association between each independent variable and EMR effectiveness. Multivariate analysis was performed using multiple linear regression to identify the most influential factors. Statistical analysis was carried out using SPSS version 23, with a significance level set at $p < 0.05$.

3. Results

The results of the study on health workers (doctors, nurses, midwives, medical recorders, pharmacists, nutritionists, physiotherapists, radiographers, and laboratory analysts) at Dungus Regional General Hospital who were directly involved in the use of EMR were 143 respondents.

Table 1 Characteristics of Research Subjects Based on Age, Gender, Length of Service, Latest Education, Occupation, and Length of Service at Dungus Regional General Hospital in 2025 (n=143).

Characteristic	n	%
Age		
< 30 years old	37	25,9
31-40 years old	78	54,5
41-50 years old	20	14,0
> 50 years old	8	5,6
Gender		
Male	81	56,6
Female	62	43,4
Final education		
Diploma	88	61,5
S1 / DIV	46	32,2
S1 and Profession	9	6,3
Jobs		
Doctor	22	15,4
Nurse	62	43,4
Midwives	5	3,5
Medical records personnel	19	13,3
Pharmacy personnel	6	4,2
Nutrisionist	8	5,6
Physiotherapy	6	4,1
Radiographers	10	7,0
Laboratory analyst	5	3,5
Length of work		
< 1 year	22	15,4
1-5 year	49	34,4
6-10 year	29	20,2
> 10 year	43	30,1
Employment status		
Permanent / Civil Servant	123	86,0
Contract	20	14,0

Table 1 indicates that most respondents were aged 31–40 years (54.5%) and male (56.6%). The majority held a Diploma degree (61.5%), with nurses representing the largest professional group (43.4%). Most respondents had 1–5 years of work experience (34.4%) and were permanent employees (86.0%). Overall, the respondent characteristics reflect a predominantly productive-age workforce with moderate experience and stable employment status.

Table 2 Characteristics of Research Variables at Dungus Hospital in 2025 (n=143).

Variable	Mean	Median	Min	Max	SD
Perceived usefulness	31,13	31,00	24	50	2,617
Perceived ease of use	30,80	31,00	25	50	2,598
Management support	30,95	30,00	24	50	2,898
Training that has been attended	31,00	30,00	23	50	2,821
Availability of supporting infrastructure	31,32	31,00	25	50	2,721
Effectiveness of using EMR	32,52	32,00	21	50	3,398

Table 2 shows that the mean scores of all independent variables ranged from 30.80 to 31.32, indicating relatively high perceptions across perceived usefulness, perceived ease of use, management support, training, and infrastructure availability. The highest mean score was found in EMR effectiveness (Mean = 32.52; SD = 3.398). The relatively small standard deviation values suggest that respondents' answers were fairly homogeneous. Overall, the results indicate a generally positive perception of EMR implementation at Dungus Regional General Hospital.

Table 3 Table of Independent and Dependent Variable Categories at Dungus Hospital in 2025 (n=143).

Characteristic	n	%
Perceived usefulness		
Less useful (< 31,00)	62	43,4
Helpful (≥ 31,00)	81	56,6
Perceived ease of use		
Not easy to use (< 31,00)	67	46,9
Easy to use (≥ 31,00)	76	53,1
Management support		
Management support is still low (< 31,00)	74	51,7
The management support is quite high (≥ 31,00)	69	48,3
Training that has been attended		
Training quality still needs improvement (< 31,00)	80	55,9
High quality training (≥ 31,00)	63	44,1
Availability of supporting infrastructure		
Need to improve hardware/network (< 31,00)	60	55,9
Adequate supporting infrastructure (≥ 31,00)	83	44,1
Effectiveness of using EMR		
Less effective (< 32,00)	54	37,8
Effective (≥ 32,00)	89	62,2

Table 3 shows that the majority of respondents perceived EMR as useful (56.6%) and easy to use (53.1%). However, more than half reported that management support was still low (51.7%) and that training quality required improvement (55.9%). In terms of infrastructure, 44.1% considered the supporting facilities adequate, while 55.9% indicated the need for improvement. Despite these limitations, most respondents rated EMR implementation as effective (62.2%). Overall, while user perception toward EMR is generally positive, improvements in managerial support, training quality, and infrastructure remain necessary.

Table 4 The Influence of Independent and Dependent Variables at Dungus Hospital in 2025 (n=143)

Independent variables	Dependent Variables	p *value*	Nilai r
Perceived usefulness	Effectiveness of using EMR	0,000	0,512
Perceived ease of use		0,000	0,508
Management support		0,000	0,577
Training that has been attended		0,000	0,493
Availability of supporting infrastructure		0,000	0,494

Table 4 indicates that all independent variables—perceived usefulness, perceived ease of use, management support, training attended, and availability of supporting infrastructure—have a statistically significant relationship with the effectiveness of EMR use ($p = 0.000$; $p < 0.05$). The correlation coefficients (r) range from 0.493 to 0.577, indicating moderate positive relationships. Among these variables, management support shows the strongest correlation ($r = 0.577$), suggesting that managerial involvement plays a key role in enhancing EMR effectiveness at Dungus Regional General Hospital.

Table 5 Multiple linear regression test of research data at Dungus Hospital in 2025 (n=143)

Independent variables	Bound variables	p *value*	Beta Value
Perceived usefulness	Effectiveness of using EMR	0,044	0,167
Perceived ease of use		0,039	0,195
Management support		0,031	0,201
Training that has been attended		0,044	0,166
Availability of supporting infrastructure		0,044	0,179

Table 5 shows that there is an effect of perceived usefulness (p=0.044), perceived ease of use (p=0.039), management support (p=0.031), training that has been attended (p=0.044) and the availability of supporting infrastructure (p=0.044) on the

effectiveness of EMR use at Dungus Hospital. The most dominant factor influencing the effectiveness of the use of EMR at Dungus Hospital is the management support variable.

Table 6 Test of the coefficient of determination of research data on research subjects at Dungus Hospital in 2025 (n=143)

Model	*R Square* Value	*Adjusted R Square* Value
1	0,621	0,607

Table 6 of the analysis results obtained an R2 coefficient of 0.607 which means that the influence of perceived usefulness, perceived ease of use, management support, training that has been followed and the availability of supporting infrastructure on the effectiveness of the use of EMR at Dungus Hospital has a great influence. This means that the effectiveness of EMR use can be influenced by perceived usefulness, perceived ease of use, management support, training that has been attended and the availability of supporting infrastructure by 60.70% and the remaining 39.30% is influenced by other variables that are not included in the modeling.

Table 7 Joint testing (Test F) of research data on research subjects at Dungus Hospital in 2025 (n=143)

Model	F Value	P Value
Regression	44,920	0,000
Residual		

Source: Primary Data of Research, 2025

Table 7 shows that the F test coefficient is 44.920 with a confidence level of 95% or 0.05. From the test results in the table, it shows a significance value of 0.000 < 0.05, thus it can be perceived usefulness, perceived ease of use, management support, training that has been followed and the availability of supporting infrastructure are simultaneously significantly related to the effectiveness of the use of EMR at Dungus Hospital.

4. Discussion

The Effect of Perceived Usefulness on the Effectiveness of the Use of Electronic Medical Records at Dungus Hospital

The results of the study indicate that perceived usefulness has a significant effect on the effectiveness of Electronic Medical Record (EMR) use at Dungus Hospital (p = 0.000; r = 0.512), demonstrating a positive relationship of moderate strength, which suggests that higher perceptions of EMR benefits among healthcare workers are associated with greater effectiveness in supporting health services. Descriptively, the mean perceived usefulness score of 31.13 with relatively low variability indicates that most respondents perceived EMR as moderately beneficial and shared fairly homogeneous views; however, the finding that 43.4% of respondents still considered EMR less useful highlights the need for system strengthening and improved technical and user support to optimize its utilization (AlQudah et al., 2021).

The results of the categorization showed that as many as 56.6% of respondents considered EMR useful, while 43.4% considered it less useful. These findings indicate that although the majority of users have experienced the benefits of EMR, there are still significant proportions who have not experienced the optimal impact. This can be caused by differences in digital literacy levels, adaptation to system changes, and variations in workload between professions. This condition shows that the effectiveness of EMR is not only determined by the availability of the system, but also by the readiness of human resources to utilize it optimally (Torab-Miandoab et al., 2025).

In the multiple linear regression test, the perceived usefulness variable showed a significance value of p = 0.044 with a beta coefficient of 0.167. This shows that perceived usefulness has a positive influence on the effectiveness of EMR use, even though its strength is moderate. The R Square value of 0.621 and the Adjusted R Square of 0.607 indicate that about 60.7% of the variation in the effectiveness of EMR usage can be explained by variables in the model, while the rest is influenced by other factors such as ease of use, management support, infrastructure readiness, and user competence.

These findings are consistent with the Technology Acceptance Model (TAM), which identifies perceived usefulness as a key determinant of technology acceptance, and are supported by recent evidence showing that healthcare workers who experience direct benefits of EMR such as time efficiency, improved documentation accuracy, and easier access to patient information demonstrate higher acceptance and more effective use, highlighting the strategic role of perceived benefits in successful digital health implementation (Torkman, Ghapanchi and Ghanbarzadeh, (2025).

The respondent characteristics support the study findings, as most participants were aged 31–40 years, had Diploma or Bachelor's education, worked primarily as nurses and doctors, and had 1–10 years of experience, indicating a productive, technologically adaptive workforce with sufficient educational background and practical experience to perceive and evaluate the benefits of EMR use (Jaana et al., 2025). The predominance of permanent employees supports the stability and sustainability of EMR use, as long-term institutional commitment encourages greater adaptation and optimization of health information systems, consistent with previous research (Hoxha et al., 2024).

Overall, the study confirms that perceived usefulness plays a crucial role in enhancing the effectiveness of EMR use by improving efficiency, documentation quality, and service coordination, while continuous training, technical support, and system enhancement remain necessary to ensure equitable benefits for all health workers (S. Lee, 2022; Ondogan et al., 2023).

The researcher argues that the increase in the effectiveness of the use of EMR at Dungus Hospital does not only depend on the availability of technology, but is largely determined by the extent to which health workers interpret the benefits of the system in supporting daily work, service quality, and patient safety.

The Effect of Perceived Ease of Use on the Effectiveness of the Use of Electronic Medical Records at Dungus Hospital

The results showed that perceived ease of use had a significant effect on the effectiveness of the use of EMR at Dungus Hospital ($p = 0.000$; $r = 0.508$), with a positive relationship of moderate strength, which confiEMRd that the ease of use of the system increased the effectiveness of its use in supporting health services (Gedikci Ondogan et al., 2023).

The results of multiple linear regression showed that perceived ease of use had a positive effect on the effectiveness of EMR use ($p = 0.039$; $\beta = 0.195$), with the model able to explain 60.7% variation in use effectiveness, while the rest was influenced by other factors such as management support, system quality, and organizational culture.

These findings are in line with the Technology Acceptance Model (TAM) which places perceived ease of use as an important determinant in the acceptance of technology (Menant et al., 2021), where an easy-to-understand and operated system increases interest in use as well as perception of benefits (Lun *et al.,* 2024), and is empirically proven to improve work efficiency, reduce cognitive load, and accelerate clinical documentation on the use of EMR (Asgari et al., 2024; M. Lee et al., 2025).

The characteristics of respondents at Dungus Hospital, which are dominated by productive age of 31–40 years and Bachelor Diploma graduates, show adequate cognitive readiness and basic skills in understanding health information systems, thereby supporting the perception of the ease of use of EMR, although adaptation is still influenced by experience and intensity of system use (Tsai et al., 2020).

The majority of respondents work as nurses and physicians as primary users of EMR, with a tenure of 1–10 years, indicating that the demands of complex clinical tasks and experience comparing manual and digital systems make the perception of ease of use an important factor in assessing the effectiveness of EMRs (Chimbo & Motsi, 2024; Jimma & Enyew, 2022).

The dominance of employees still supports the perception of the ease of use of EMR, because long-term commitment and job stability encourage adaptation and acceptance of health information technology (Derecho et al., 2024; Veenstra et al., 2022).

Overall, perceived ease of use is a key factor in increasing the effectiveness of the use of EMR at Dungus Hospital, because the ease of the system encourages work efficiency, comfort, trust, and sustainability of use, so it is necessary to simplify the interface, continuous training, and technical assistance to improve the quality of service, documentation, and patient safety.

The Effect of Management Support on the Effectiveness of the Use of Electronic Medical Records at Dungus Hospital

The results showed that management support had a significant effect on the effectiveness of the use of EMR at Dungus Hospital ($p = 0.000$; $r = 0.577$), with a moderate to strong positive relationship, which confiEMRd that the better the management support, the more effective the use of EMR in supporting health services.

The results of multiple linear regression showed that management support had a significant and positive effect on the effectiveness of EMR use ($p = 0.031$; $\beta = 0.201$), with the model explaining 60.7% variation in effectiveness of use, while the rest were influenced by other factors such as user competence, system quality, and organizational culture.

These findings are in line with the Technology Acceptance Model (TAM) which emphasizes that management support as an important external factor plays a role in increasing the perception of usability, ease of use, and sustainability of technology utilization through the provision of facilities, supporting policies, training, and leadership involvement (Ali et al., 2022; Yunus et al., 2023).

The results of this study are also in line with the findings by Uktuvia *et al.* (2024) which confirms that the successful implementation of EMR is highly dependent on leadership commitment, policy clarity, and resource support, because without strong managerial support health information systems are less likely to be utilized optimally even though they are technically available.

The characteristics of respondents who are dominated by productive age, with a bachelor's degree, and permanent employee status show readiness to adapt and understand EMR, while emphasizing the importance of management support in maintaining motivation, consistency, and compliance with the use of EMR in a sustainable manner (Alsyouf et al., 2022).

The dominance of nurses and doctors as the main users of EMR confirms that management support needs to be operational and applicative to reduce administrative burdens and improve service efficiency, thus facilitating the acceptance of EMR as part of daily work practices (Alqahtani et al., n.d.).

Overall, this study confirms that management support plays a strategic role in increasing the effectiveness of EMR use through the provision of infrastructure, clear policies, ongoing mentoring, and a supportive work climate, in line with the findings Hossain *et al.* (2025) that emphasizes the importance of leadership involvement and organizational commitment in the successful implementation of EMR.

Overall, this study confirms that management support plays a strategic role in increasing the effectiveness of the use of EMR through the provision of infrastructure, clear policies, ongoing mentoring, and the creation of a supportive work climate, where the active involvement of leaders and organizational commitment are the keys to the successful implementation of electronic medical record systems in healthcare facilities.

In line with these findings, the research by Amrullah, Suprapto and Indasah (2025) emphasized that management support increases motivation and consistency in the use of health information systems through clear policies, provision of resources, and continuous training, because without such support a technically sound system is less likely to be utilized optimally.

Other study by Nguyen *et al.* (2022) it also emphasized that the successful implementation of electronic medical records is greatly influenced by responsive leadership and management involvement in overcoming technical and non-technical barriers. In this context, management support not only functions as a decision-maker, but also as a driver of work culture change towards sustainable use of technology.

The results of this study are also in line with the findings of the Wati, Budiharto and Minarni (2024) which shows that strong managerial support improves the effectiveness of the use of health information systems, confirming that the success of EMRs is not only determined by technology, but also by the readiness of the organization to manage changes.

The findings of this study confirm that management support is the dominant factor in increasing the effectiveness of EMR use through consistent policies, provision of infrastructure, and strengthening the capacity of human resources, because without strong and sustainable managerial support, the implementation of EMR risks not achieving optimal results even though health workers have good individual readiness.

The Effect of Training That Has Been Followed on the Effectiveness of the Use of Electronic Medical Records at Dungus Hospital

The results showed that training had a significant effect on the effectiveness of the use of EMR at Dungus Hospital ($p = 0.000$; $r = 0.497$), with a moderate positive relationship, which confiEMRd that the better the quality and intensity of training, the more effective the use of EMR in supporting health services (Lin et al., 2020).

The results of multiple linear regression showed that training had a positive and significant effect on the effectiveness of EMR use ($p = 0.044$; $\beta = 0.166$), with the model explaining 60.7% variation in use effectiveness, while the rest were influenced by other factors such as management support, ease of use, and technology readiness.

These findings are in line with the theory of Human Capital and the Technology Acceptance Model (TAM) which asserts that training increases competence, confidence, and acceptance of technology, and it is evident that structured and continuous training increases the adoption and effectiveness of the use of EMR compared to limited training (Amrullah et al., 2025; Khan et al., 2024).

Various studies confirm that the success of EMR implementation is greatly influenced by the quality of initial training and ongoing mentoring tailored to user needs, supported by management and institutional resources, because continuous training has been proven to increase confidence, compliance, work efficiency, and satisfaction of health workers with electronic systems (Nguyen et al., 2022; Ştefan et al., 2024; Wati et al., 2024).

The characteristics of respondents at Dungus Hospital, which are dominated by productive age, Diploma-Undergraduate education, and the nursing and doctor professions, show readiness to receive technology-based training, but the variation in working hours and the high complexity of clinical tasks require EMR training that is applicable, contextual, and according to the workflow so as not to become an additional burden in services (Gedikci Ondogan et al., 2023).

The dominance of employees continues to increase the effectiveness and sustainability of the impact of training, because long-term attachment to the institution makes training investment more influential on the performance and sustainable use of health information systems (Caterino et al., 2025).

Overall, this study emphasizes that planned, sustainable, and user-specific training is a key factor in increasing the effectiveness of the use of EMR at Dungus Hospital by strengthening the understanding, skills, and confidence of health workers, so that training needs to be prioritized as the main strategy to strengthen the implementation of EMR (Kessy et al., 2024).

The Effect of the Availability of Electronic Medical Record Supporting Infrastructure on the Effectiveness of the Use of Electronic Medical Records at Dungus Hospital

The results showed that the availability of supporting infrastructure had a significant effect on the effectiveness of the use of EMR in Dungus Hospital ($p = 0.000$; $r = 0.494$), with a medium-strength positive relationship, which confiEMRd that adequate infrastructure increased the effectiveness of EMR utilization in health services (Ddamba et al., 2025).

The results of multiple linear regression showed that the availability of supporting infrastructure had a positive and significant effect on the effectiveness of EMR use ($p = 0.044$; $\beta = 0.179$), with the model being able to explain 60.7% of the variation in usage effectiveness, while the rest was influenced by other factors such as user competence, management support, and training quality.

These findings are in line with socio-technical system theory which emphasizes the importance of technological infrastructure readiness in the success of information systems, because stable and adequate infrastructure increases service

reliability, while network and device limitations are the main obstacles to EMR implementation (Ali et al., 2022; Bekele et al., 2024; Roach et al., 2025).

Research by Danso and Lasim (2024) It shows that the availability of adequate technological infrastructure is significantly related to the effectiveness of health information systems through improved data access speed, documentation accuracy, and continuity of service, while suboptimal infrastructure has an impact on service delays, increased workload, and decreased user trust.

Research results by Stoumpos, Kitsios and Talias (2023) It also emphasized that the success of the digital transformation of health depends heavily on the readiness of an integrated and sustainable technological infrastructure, including devices, networks, maintenance, data security, and technical support, since the unpreparedness of these aspects can reduce the effectiveness of the system even if the user has adequate competence.

The characteristics of the respondents, which are dominated by productive age, diploma-undergraduate education, and the nursing and doctor professions, show readiness to adapt and competency in the use of EMR, but infrastructure limitations can hinder performance, slow down services, increase workload, and have an impact on service quality, so that infrastructure is an important determinant of the quality of health services (Ddamba et al., 2025).

The dominance of permanent employees shows that infrastructure investment has a long-term impact on service effectiveness, as organizational attachment encourages the sustainable use of the system, in line with the finding that digital infrastructure readiness is a key determinant of the success of technology-based healthcare transformation (Amrullah et al., 2025; Stoumpos et al., 2023).

Overall, this study emphasizes that the availability of reliable and sustainable supporting infrastructure is a crucial component in increasing the effectiveness of the use of EMR at Dungus Hospital, because it smoothens the work process, increases user trust, accelerates services, and supports patient quality and safety.

The Most Dominant Factor Affecting the Effectiveness of the Use of Electronic Medical Records at Dungus Hospital

The results showed that perceived usefulness, perceived ease of use, management support, training, and availability of supporting infrastructure simultaneously had a significant effect on the effectiveness of EMR use at Dungus Hospital ($p = 0.000$; $F = 44.920$), confirming that all independent variables together contribute strongly in explaining the effectiveness of EMR use.

The results of the analysis showed that all variables (perceived usefulness, perceived ease of use, management support, training, and availability of infrastructure) had a partial significant effect on the effectiveness of EMR use, with management support as the most dominant factor, confirming that EMR effectiveness is determined by the interaction of various complementary factors.

The dominance of management support emphasizes that the success of EMR implementation is highly dependent on the commitment of leaders in providing policies, resources, and a conducive work environment, because structural and leadership support increases organizational readiness, motivation of health workers, and acceptance of technology (Park et al., 2020).

The characteristics of the respondents, which are dominated by productive age, adequate education, and the nursing and medical professions, show the readiness to adapt and competency in the use of EMR, but the effectiveness of implementation is highly dependent on management support to provide policy direction and ensure that the system supports clinical services efficiently without increasing the workload. This is in line with the findings Amrullah, Suprapto and Indasah (2025) which states that the active involvement of hospital leaders is a key factor in the success of the digital transformation of healthcare services.

The majority of respondents with a working period of 1–10 years showed readiness to adapt to changes in the work system, but the utilization of this potential is highly dependent on ongoing training, technical support, and clarity of management policies to optimize the effectiveness of the EMR.

The results showed that the five variables simultaneously explained 60.7% of the variation in the effectiveness of using EMR, confirming that the effectiveness of EMR is the result of a synergy of individual, organizational, and technological factors, with management support as the most dominant factor through leadership commitments, clear policies, strengthening human resources, and adaptive organizational culture, so that it is the key to improving the quality of health services in a sustainable manner.

5. Conclusions

The conclusion of this study shows that perceived usefulness, perceived ease of use, management support, training that has been followed, and the availability of supporting infrastructure simultaneously have a significant effect on the effectiveness of the use of Electronic Medical Records (EMR) at Dungus Hospital, with an R Square value of 0.621 which means that 60.7% of the effectiveness of EMR use can be explained by these five variables, while the rest is influenced by other factors outside the study. The effectiveness of using EMR is in the category of quite effective and is supported by the significance value of the simultaneous test $p = 0.000$. Partially, all variables were shown to have a significant effect with a medium-strength positive relationship, where the perception of benefits and ease of use increased the effectiveness of the system, training played a role

in strengthening user understanding and skills, and the availability of infrastructure to support the smooth running of services. However, management support is the most dominant factor influencing the effectiveness of EMR use, emphasizing that the success of EMR implementation is highly dependent on leadership commitment, policy clarity, and adequate provision of resources to encourage optimal and sustainable utilization of the system.

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Ethical considerations

This study was approved by the Health Research Ethics Committee of STRADA Indonesia University (No. 1123444/EC/KEPK/I/11/2025).

Conflict of Interest

The authors declare no conflicts of interest.

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