

The Impact of Electronic Medical Records Implementation on the Effectiveness of Inpatient Registration Services at Hospital X

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Abstract. This study aims to examine the effect of Electronic Medical Records implementation on the effectiveness of inpatient registration services at Hospital X. The method used is quantitative with a survey approach, employing questionnaires as the data collection instrument. The sample consists of 24 medical record nurses selected by total sampling. Data were analyzed using instrument testing, classical assumption tests, simple linear regression, hypothesis testing, and the coefficient of determination (R^2) with the assistance of SPSS software. The results of the simple linear regression test show that the implementation of Electronic Medical Records has a positive and significant effect on the effectiveness of inpatient registration services, with a regression coefficient of 0.918 and a significance value (Sig.) of 0.000 (< 0.05). Furthermore, the coefficient of determination (R^2) value of 0.873 indicates that 87.3% of the variation in service effectiveness can be explained by the implementation of Electronic Medical Records, while the remaining variation is influenced by other factors outside the model. These findings highlight the importance of Electronic Medical Records implementation in improving the effectiveness of inpatient registration services at Hospital X.

Keywords: *Electronic Medical Records (EMR), Service Effectiveness, Inpatient Registration*

Introduction

Hospitals play a crucial role in delivering comprehensive healthcare services, ranging from health promotion to rehabilitation. In the digital era, hospitals are expected to enhance service quality, efficiency, and patient satisfaction through the integration of information technology (Ministry of Health, 2021). Medical records are a vital

component of healthcare services, as they contain patient histories and form the basis for clinical decision-making (Ministry of Health, 2022). In accordance with Ministry of Health Regulation No. 24 of 2022, every healthcare facility is required to implement Electronic Medical Records (EMR) to ensure continuity of care and support data-driven policy development (Ministry of Health, 2022).

The effective use of electronic health information systems can significantly improve administrative efficiency and patient satisfaction (Hidayat et al., 2025). Service effectiveness in hospitals refers to the extent to which healthcare processes achieve the intended outcomes optimally, including speed, accuracy, quality, and patient satisfaction with the services received (Johar & Patagundi, 2018). The implementation of EMRs also plays a critical role in reducing clinical errors, as the system enables more accurate, integrated, and accessible patient data for healthcare professionals (Anwar, 2024).

Effective hospital services are defined by the system's ability to deliver optimal outcomes by maximizing speed, accuracy, and quality, while also enhancing patient satisfaction (Setyadi & Nadjib, 2023). EMRs contribute to the effectiveness of inpatient services by simplifying the process of recording and managing patient data digitally (Rinekasari & Ulfah, 2024). Effectiveness in this context includes streamlined workflows, reduced administrative and clinical errors, and integrated information across service units to support accurate clinical decisions. Empirical data from Mombasa County even show a 13% reduction in patient waiting times and a 79% increase in service integration—indicating a significant improvement in service effectiveness (Waronja & Mogote, 2024).

However, the implementation of EMRs in some hospitals still faces challenges such as limited human resources and inadequate infrastructure, which hinder the optimization of inpatient registration services (Azka & Wahab, 2024). Preliminary observations at Hospital X revealed that the EMR system, which began implementation in early 2024, is still in a transitional phase from manual to digital processes. The inpatient registration process has yet to be fully integrated, and several issues remain, including insufficient staff training, lack of infrastructure readiness, and limited technological adaptation among medical personnel.

A previous study by Latipah et al. (2021) demonstrated that EMRs are more effective and efficient compared to manual records, as they support task execution, program planning, and hospital service standards. Based on this background, this study aims to investigate "The Impact of Electronic Medical Records Implementation on the Effectiveness of Inpatient Registration Services at Hospital X."

Methodology

This study employs a quantitative associative approach, which aims to measure the relationship or influence between two variables statistically (Sugiyono, 2018). The research population consists of 24 inpatient registration officers, all of whom are selected as the sample using a total sampling technique. Data were collected using a closed-ended questionnaire consisting of 9 statements for each variable, using a Likert scale.

The questionnaire data were analyzed through instrument testing to ensure validity and reliability. Validity testing was conducted by comparing the calculated r-value (r-count) with the critical r-value (r-table = 0.404; df = 22), where a significance value (Sig.) < 0.05 indicates that the item is valid. Reliability testing used Cronbach's Alpha, where a value of ≥ 0.600 indicates that the instrument is reliable.

Before conducting regression analysis, classical assumption tests were performed:

1. Normality Test: Conducted to ensure that the residual data are normally distributed. This was tested using the Kolmogorov–Smirnov test, where Sig. > 0.05 indicates a normal distribution.
2. Linearity Test: Conducted to determine whether the relationship between the independent and dependent variables is linear. If the Sig. value of Deviation from Linearity > 0.05, it indicates no significant deviation and confirms a linear relationship between variables X and Y.
3. Homoscedasticity Test (Scatterplot Test): The data points should be randomly and evenly distributed around a straight line without forming a specific pattern, indicating that the assumption of homoscedasticity is met (Sahir, 2021).

Next, a simple linear regression analysis was conducted to measure the strength and direction of the relationship between the two variables using the regression coefficient. Hypothesis testing was performed by analyzing the significance value from the regression output. If Sig. < 0.05 and t-count > t-table (t-table = 2.067, df = 23), the alternative hypothesis is accepted, indicating a significant influence of variable X on variable Y. Additionally, the coefficient of determination (R^2) was used to determine the extent to which variable X influences variable Y (Sahir, 2021).

Results and Discussion

Hospital X began implementing the Electronic Medical Records (EMR) system in early 2024 as part of its effort to improve the effectiveness of services, particularly in the inpatient registration unit. This EMR implementation aims to streamline administrative processes, reduce data entry errors, and enhance the integration of information across service units—ultimately leading to more efficient and responsive care that meets patient needs. Although still in the transitional phase, the hospital is

continuously working on developing an integrated system to optimize service effectiveness. However, the success of EMR implementation also heavily depends on the readiness of human resources and infrastructure to ensure the system functions optimally.

1. Validity Test Results

Table 1. Validity Test Results

Item Code	r-count	r-table	Description
X1.1	0.934	0.404	Valid
X1.2	0.870	0.404	Valid
X1.3	0.894	0.404	Valid
X1.4	0.877	0.404	Valid
X1.5	0.798	0.404	Valid
X1.6	0.951	0.404	Valid
X1.7	0.867	0.404	Valid
X1.8	0.926	0.404	Valid
X1.9	0.839	0.404	Valid
Y1.1	0.894	0.404	Valid
Y1.2	0.879	0.404	Valid
Y1.3	0.894	0.404	Valid
Y1.4	0.808	0.404	Valid
Y1.5	0.909	0.404	Valid
Y1.6	0.935	0.404	Valid
Y1.7	0.881	0.404	Valid
Y1.8	0.921	0.404	Valid
Y1.9	0.744	0.404	Valid

Based on the results of the validity test presented in Table 1, it is evident that all statement items for the variable Electronic Medical Records (EMR) Implementation (X) and Effectiveness of Inpatient Registration Services (Y) have r-count values greater than the r-table value (0.404). Therefore, all items are considered valid and suitable for use in further analysis.

2. Reliability Test Results

Based on the results of the reliability test presented in Table 2, the variable Electronic Medical Records (EMR) Implementation (X) has a Cronbach's Alpha value greater

than the critical threshold of 0.600. Therefore, it can be concluded that the instrument used is reliable.

Table 2. Reliability Test Results

Variable	Cronbach's Alpha (r-alpha)	Critical Value (r-critical)	Description
Electronic Medical Records (X)	0.965	0.600	Reliable
Service Effectiveness (Y)	0.960	0.600	Reliable

Classical Assumption Test Results

1. Normality Test Results

Table 3. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		24
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	2.97058241
Most Extreme Differences	Absolute	.133
	Positive	.089
	Negative	-.133
Test Statistic		.133
Asymp. Sig. (2-tailed)		.200 ^{c,d}

Based on the results of the normality test using the Kolmogorov–Smirnov test presented in Table 3, the significance value was 0.200, which is greater than 0.05. Therefore, it can be concluded that the data are normally distributed.

2. Linearity Test Results

Table 4. Linearity Test Results

ANOVA Table	Sum of Squares	df	Mean Square	F	Sig.
Deviation from Linearity	94.044	10	9.404	1.036	.470

The results of the linearity test presented in Table 4 indicate that the relationship between the Electronic Medical Records (EMR) variable and Service Effectiveness is

linear. The significance value for Deviation from Linearity is 0.470, which is greater than 0.05, indicating that the model satisfies the assumption of linearity.

3. Heteroscedasticity Test Results (Scatterplot Method)

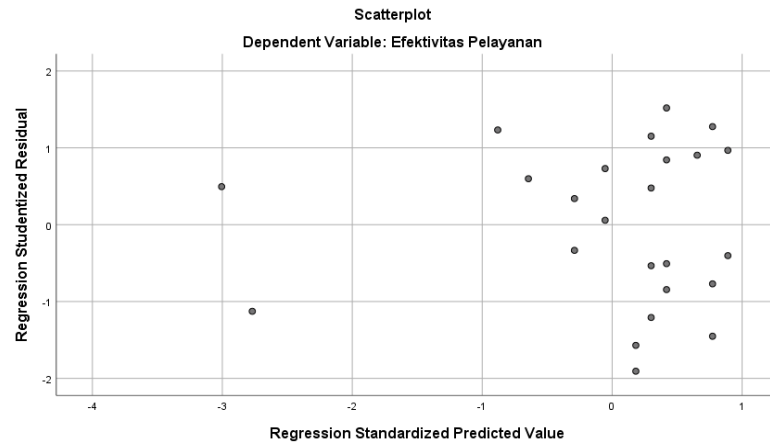


Figure 1. Scatterplot Result of the Heteroscedasticity Test

The results of the scatterplot test show no clear or systematic pattern, indicating that the data points are randomly distributed. Therefore, it can be concluded that there is no indication of heteroscedasticity in this dataset.

Simple Linear Regression and Hypothesis Test Results

Table 5. Simple Linear Regression Test Results

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.850	2.869		.296	.770
	Rekam Medis Elektronik	.918	.075	.934	12.282	.000

a. Dependent Variable: Efektivitas Pelayanan

Based on Table 5, the simple linear regression equation obtained is:

$$Y = 0.850 + 0.918X$$

The regression coefficient for the Electronic Medical Records (EMR) variable is 0.918, with a significance value (Sig.) of 0.000, indicating a positive influence of EMR on service effectiveness. This means that for every one-unit increase in the implementation of EMR, the effectiveness of service increases by 0.918 units.

The hypothesis test results for the simple linear regression also show that the EMR variable has a significant effect on service effectiveness, as indicated by a p-value of $0.000 < 0.05$ and a t-value of $12.282 > t\text{-table value of } 2.067$. Therefore, the null

hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted, which means that there is a positive and significant effect of EMR implementation on service effectiveness at Hospital X.

Coefficient of Determination (R^2) Test Results

Table 6. Coefficient of Determination (R^2) Test Results

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.934 ^a	.873	.867	3.03735
a. Predictors: (Constant), Rekam Medis Elektronik				
b. Dependent Variable: Efektivitas Pelayanan				

Based on the results of the coefficient of determination (R^2) test presented in Table 6, the R Square value is 0.873, indicating that 87.3% of the variation in the service effectiveness variable can be explained by the Electronic Medical Records (EMR) variable. The remaining 12.7% is influenced by other factors outside the scope of this research model.

The results of the simple linear regression analysis indicate that the Electronic Medical Records (EMR) variable has a positive and significant influence on service effectiveness. This finding reflects that EMR is not merely a documentation tool, but a strategic factor that contributes to improving service performance in hospitals. The coefficient of determination (R Square) value of 0.873 shows that 87.3% of the variation in service effectiveness can be explained by the implementation of EMR. This is a notably high value, suggesting that EMR is a dominant variable in explaining service effectiveness at Hospital X.

This study reinforces the mandate outlined in the Regulation of the Minister of Health of the Republic of Indonesia No. 24 of 2022 concerning medical records, which emphasizes the importance of EMR implementation as an integral part of efforts to improve the quality and effectiveness of healthcare services. The high coefficient of determination in this study indicates that EMR not only fulfills regulatory requirements but also makes a tangible contribution to work efficiency and patient care (Ministry of Health, 2022).

These findings are consistent with the study by Kruse et al. (2018), which found that EMR implementation improves productivity, efficiency, and healthcare quality, despite challenges such as incomplete data and lack of system interoperability. In addition, a study by Situmorang et al. (2025) also demonstrated a significant relationship between successful EMR implementation and the effectiveness and quality of services at Athaya Medika Mother and Child Hospital, where EMR success contributed to improved service delivery.

Hospital X is therefore encouraged not only to maintain its current EMR system but also to conduct periodic evaluations of system performance, update software in line with technological advancements, and promote system integration across service units. These actions align with recommendations from the World Health Organization (WHO, 2021), which emphasize the importance of digital health governance, interoperable systems, and stakeholder involvement in the planning and development of digital health infrastructure.

Conclusion

Based on the results of the simple linear regression analysis, it can be concluded that the implementation of Electronic Medical Records (EMR) has a positive and significant impact on service effectiveness at Hospital X. The regression coefficient value of 0.918 with a significance level of 0.000 indicates that any increase in EMR implementation directly contributes to improved service effectiveness. Furthermore, the coefficient of determination (R Square) value of 0.873 indicates that 87.3% of the variation in service effectiveness can be explained by the EMR variable, making it the dominant factor in this model.

These findings are consistent with national regulations and previous studies, which emphasize the importance of EMR in improving administrative efficiency, reducing clinical errors, and supporting the quality of healthcare services. Therefore, the continuous development and optimization of the EMR system is essential—including technological updates and cross-unit integration—to ensure the maximum and sustainable effectiveness of services within the hospital environment.

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