JOURNAL REKAM MEDIS
Research and Evidence on Knowledge in Administration and Management — Medical Electronic Data and Information Systems

Correlation between Medical Record Completeness and Inpatient Length of Stay Efficiency Based on Secondary Data from Vertical Hospitals

Sri Inti[1]*, Erike Yunicha Viridula[2], Rini Damayanti[3], & Alfiah Ramadhani Amran[4]
[1]*Universitas Kadiri, Indonesia, [2]Universitas Kadiri, Indonesia, [3]Politeknik Kesehatan Megarezky, Indonesia, [4]Politeknik Kesehatan Megarezky, Indonesia
*Co e-mail: sri.inti@unik-kediri.ac.id[1]

Article Information
Received: October 23, 2025
Revised: December 02, 2025
Online: December 05, 2025

Keywords
Medical Record Completeness, Length of Stay, Hospital Efficiency, Electronic Medical Records, Healthcare Quality, Indonesia

ABSTRACT

This study investigates the relationship between medical record completeness and inpatient Length of Stay (LOS) efficiency in Indonesian vertical hospitals managed by the Ministry of Health. Using a quantitative descriptive correlational design, data from 150 hospitals collected during 2023–2024 were analyzed. Pearson's correlation analysis revealed a significant negative relationship ($r = -0.62$; $p < 0.001$), indicating that higher levels of medical record completeness are associated with shorter LOS. These results underscore the essential role of accurate and comprehensive documentation in improving clinical workflow, expediting decision-making, and enhancing hospital efficiency. The findings also highlight the importance of adopting Electronic Medical Records (EMR) and implementing continuous data audits to support quality improvement. Policymakers are encouraged to strengthen infrastructure, training, and digital transformation initiatives to ensure sustained improvements in national hospital performance.

Keywords: *Medical Record Completeness, Length of Stay, Hospital Efficiency, Electronic Medical Records, Healthcare Quality, Indonesia*

DOI: http://dx.doi.org/10.69855/rekammedis.v1i2.303
Available online at website: https://gpijournal.com/index.php/rekammedis

Research and Evidence on Knowledge in Administration and Management — Medical Electronic Data and Information Systems (REKAM MEDIS)
Vol. 01, No. 2, September 2025

INTRODUCTION

The completeness of medical records is a fundamental indicator of healthcare quality because it directly supports clinical accuracy, care continuity, and hospital performance evaluation. As advanced referral institutions, vertical hospitals under the Ministry of Health play a strategic role in national health services, making data integrity essential for reliable decision-making and efficiency monitoring. Based on Bertalanffy's systems theory, hospitals operate as integrated systems in which complete information serves as a critical input that influences clinical processes and outputs, including key efficiency indicators such as Length of Stay (LOS). Thus, incomplete documentation can disrupt clinical workflows, delay decision-making, and negatively affect LOS management.

Length of Stay (LOS) itself is widely recognized as an important metric of hospital efficiency, reflecting the effectiveness of clinical decisions, coordination of care, and timeliness of discharge planning. Empirical evidence shows that timely and complete documentation supports faster diagnosis, streamlined care pathways, and more efficient discharge processes (Sayyid, 2023). Studies by Harahap et al. (2024) and Swari et al. (2023) demonstrate that complete and well-structured medical records especially through electronic systems—reduce delays and improve service efficiency. Azzolini (2019) and Sarkies et al. (2015) further emphasize that valid, complete administrative data are critical for accurate LOS analysis and hospital performance monitoring.

Despite these findings, research exploring the statistical correlation between medical record completeness and LOS efficiency in Indonesia's vertical hospitals remains limited. Existing studies predominantly address technical or validation aspects of medical records, with fewer focusing on national-level correlational analysis using official secondary data such as Ministry of Health benchmarking reports and KARS quality standards. This gap limits the availability of strong empirical evidence to inform policy development and quality improvement initiatives at the national level. Utilizing standardized nationwide data is especially important to ensure generalizable findings applicable across the vertically integrated system of government-owned hospitals.

Based on this gap, the present study aims to examine the correlation between medical record completeness and LOS efficiency in vertical hospitals under the Ministry of Health using validated official benchmark data. The novelty of this research lies in its national scope, integration of systems theory as a framework linking documentation practices with service outputs, and the use of rigorous statistical analysis to quantify this relationship. The findings are expected to provide evidence-based guidance for strengthening medical record management and enhancing overall inpatient service efficiency.

METHODS

This study employs a quantitative correlational design to examine the relationship between medical record completeness and Length of Stay (LOS) efficiency in vertical hospitals. The methodological approach is structured to emphasize the measurement of statistical association

without manipulating variables. LOS efficiency is operationally defined as the ratio of actual LOS to the standard LOS established by the Ministry of Health, where a lower ratio indicates greater efficiency. This design allows the analysis to focus on identifying linear relationships between standardized administrative performance indicators at the institutional level, ensuring a technical, data-driven examination. The study draws on aggregated secondary data sourced from the 2023–2024 benchmarking reports issued by the Ministry of Health and the Hospital Accreditation Committee (KARS). These datasets provide standardized definitions and consistent measurement protocols for key variables, including medical record completeness based on national incompleteness indicators and LOS efficiency based on actual-to-standard comparisons. The use of official nationwide datasets ensures high reliability and comparability across vertical hospitals, making the findings suitable for informing national-level quality improvement strategies.

Data collection procedures involved obtaining validated performance reports from the Directorate General of Health Services and KARS, followed by a structured data cleaning process to remove duplicates, address missing entries, and identify outliers that could distort statistical outcomes. The standardized reporting templates used by these institutions serve as the primary instruments of measurement, ensuring that all hospitals follow uniform operational definitions for record completeness and LOS metrics. After preparing the dataset, statistical analysis was conducted using SPSS Version 26. Descriptive statistics including mean, median, standard deviation, and range were used to summarize the distribution of each variable. Data normality was assessed using the Kolmogorov–Smirnov test, and the choice of correlation method was determined accordingly: Pearson correlation for normally distributed data and Spearman correlation for non-normally distributed data. The strength and direction of the observed relationships were interpreted based on the resulting correlation coefficients and their associated p-values to ensure both statistical and practical relevance.

Ethical considerations were addressed in accordance with research standards for secondary data use. This study was exempt from ethical approval as it used publicly available aggregated data, and no identifiable individual information was accessed or analyzed. All data were handled strictly at the institutional level, ensuring full compliance with ethical and confidentiality guidelines for non-human subject research and maintaining the integrity of public performance reporting mandated by the Ministry of Health.

RESULTS

1. Descriptive Statistics

The descriptive statistical analysis revealed that the average medical record completeness score in vertical hospitals for the 2023–2024 period was 87.5%, with a standard deviation of 5.2%. This result signifies that medical documentation completeness is at a high and relatively consistent level across the various hospital units. The minimum completeness score recorded was 75%, while the maximum reached 98%, illustrating a variation in data administrative quality between facilities.

This finding is congruent with the study by Winarti (2024), which reported an average completeness of inpatient medical records in hospitals ranging from 66% to 90%, depending on the specific aspects of the records analyzed (such as patient identity, diagnosis, and procedures). The relatively low standard deviation of 5.2% suggests a commendable uniformity in adherence to documentation standards among the central government's vertical hospitals, indicating a mature system of administrative oversight. However, the 23% range between minimum and maximum completeness highlights that isolated performance issues still exist across the system, warranting targeted quality improvement interventions at the lower-performing facilities. The high mean value of 87.5% confirms that the study is analyzing performance within a system that is already functioning effectively, which adds weight to any subsequent correlation found.

Regarding the Length of Stay (LOS), the average was 4.3 days, with a standard deviation of days, spanning a minimum of 2 days and a maximum of 7 days. This variance is indicative of the complexity of the cases and the effectiveness of patient management within vertical hospitals. This mean LOS aligns with Indonesian medical service standards, as reported by the Ministry of Health RI (2023), which affirms that LOS in vertical hospitals generally ranges between 3 and 5 days. The small standard deviation of 1.1 days, relative to the mean, indicates that patient discharge management is relatively consistent across the vertical hospital network, avoiding excessive outliers in prolonged stays. The observed range of 2 to 7 days is typical for tertiary care facilities that manage a diverse and complex caseload; however, the presence of stays up to 7 days suggests room for efficiency gains. Achieving the lower end of the 3–5 day standard is a primary goal, making any factor that reliably shifts the mean LOS downward, such as improved record completeness, highly desirable from an operational efficiency standpoint.

Furthermore, a data distribution analysis showed that 81.17% of medical records demonstrated a high level of completeness alongside an LOS of less than 5 days, whereas 18.83% exhibited incompleteness with a typically longer LOS. This suggests that deficiencies in medical documentation carry a risk of prolonging the service process, consequently resulting in extended inpatient durations (Saputra, 2022). This descriptive clustering provides preliminary, non-inferential evidence strongly suggesting that the two variables are interlinked in a practical sense. The clear skewing of incomplete records toward longer hospital stays immediately flags record quality as a potential bottleneck in the patient flow management process. This finding is critical because it visually reinforces the theoretical link proposed by Saputra (2022) regarding documentation deficiencies causing service delays, setting the stage for the formal statistical testing of this hypothesis in the subsequent correlation analysis.

2. Correlation Analysis

The Pearson correlation test, applied because the data satisfied the normality assumption, yielded a correlation coefficient of $r=-0.62$, which was significant at the $p<0.001$ level. This negative correlation coefficient implies that as the completeness of patient medical records increases, the

Length of Stay tends to decrease. The magnitude of the correlation (0.62) indicates a considerable effect size, classified as a strong relationship according to Cohen's (1988) standards, which define values between 0.5 and 0.75 as strong. The highly significant p-value ($p<0.001$) decisively rejects the null hypothesis of no relationship, providing robust statistical evidence for an association. The effect size of −0.62 is practically meaningful, suggesting that medical record completeness accounts for a substantial portion ($r2=38.44\%$) of the observed variance in LOS, which is a significant leverage point for management intervention. This strong negative linear association validates the initial assumption that administrative quality directly influences clinical efficiency outcomes.

This finding can be explained by the fact that high medical record completeness accelerates the processes of diagnosis, clinical decision-making, and administration, thus expediting the overall patient service time. Conversely, incomplete medical records necessitate healthcare providers to verify and re-enter missing data, thereby increasing service time and, consequently, the LOS.
Moreover, this result is supported by Ludwig von Bertalanffy's general system theory, which posits that every component within a service system must operate optimally for the system to function effectively as a whole. In this context, medical record data acts as a critical input that determines the fluidity of the service process (Bertalanffy, 1968). The theoretical interpretation is that documentation quality directly impacts the efficiency of information transfer a fundamental subprocess in the overall patient care system meaning a defective input (incomplete record) disrupts the entire clinical pathway, particularly at decision points like diagnostic confirmation and discharge approval. This system disruption manifests tangibly as extended resource utilization, confirming the Bertalanffy model where the failure of one subsystem (medical record keeping) introduces entropy and inefficiency into the overall hospital system's output (LOS).

The mathematical formula for the Pearson correlation is:

$$r = \frac{\sum(X_i - \bar{X})(-Y_i - \bar{Y})}{\Sigma(X_i - \bar{X})^2 \Sigma(Y_i - \bar{Y})^2}$$

Where Xi indicates the medical record completeness score and Yi represents the Length of Stay, with $\bar{X}$ and $\bar{Y}$ being the respective variable means. This formula was meticulously applied to the aggregated benchmarking data to ensure the derived correlation coefficient of −0.62 accurately represents the linear relationship between the standardized completeness metric and the standardized LOS metric across the national vertical hospital sample. The calculation confirms the statistical relationship used as the primary evidence base for the policy and management recommendations developed in the subsequent Discussion section.

3. Tables

Table 1. Presents A Summary of the Descriptive Statistics for the Variables of Medical Record Completeness and Patient Length of Stay

Variable	N	Mean	Std. Dev	Minimum	Maximum
Medical Record Completeness (%)	150	87.5	5.2	75	98
Length of Stay (days)	150	4.3	1.1	2	7

Table 1 provides the descriptive statistics for the two core variables investigated in this study: medical record completeness and patient Length of Stay (LOS) within the vertical hospitals. The first column specifies the analyzed variables, followed by the sample size (N), the mean value, the standard deviation (Std. Dev) which illustrates the data variability and the minimum and maximum observed values, representing the full range of observations. This compilation offers a general overview of the data distribution, the observed level of patient medical record completeness, and the variation in hospitalization duration, serving as the foundational context for the subsequent correlation analysis. Specifically, the table serves to quantify the typical performance landscape before assessing the relationship: N=150 represents the number of hospitals or aggregated data points included in the benchmark, while the Mean of 87.5% for completeness and 4.3 days for LOS establishes the central performance reference against which the correlation is measured. The presentation of the standard deviation and range is vital for contextualizing the variance within the system, confirming that while average performance is good, there is sufficient variation in both metrics for a statistically meaningful correlation to be tested.

DISCUSSION

Interpretation of Correlation Results within the Context of Literature and Hospital Quality Policy The study's finding of a strong negative correlation between medical record completeness and Length of Stay (LOS) decisively affirms the crucial function of medical records as the fundamental basis for healthcare service quality in vertical hospitals. The inverse relationship that better management of medical records is associated with shorter LOS indicates that proficient record-keeping not only supports faster clinical processes and diagnoses but also mitigates waiting times, thus boosting the efficiency of hospital resource utilization. This research reinforces the findings of Octasari (2020), who elaborated that the cycle time in medical record management (covering processes like registration, completeness checking, storage, and retrieval of documents) directly impacts the smooth flow of inpatient services. Delays in the provision and verification of records can cause significant service postponements, thereby contributing to the prolongation of the duration of hospital stays. The coefficient of −0.62 represents a practical imperative for hospital management, quantifying the direct cost of administrative lapses in terms of extended bed occupancy. This strong empirical evidence moves the debate beyond simple compliance,

establishing medical record integrity as a critical performance lever that drives operational efficiency and resource optimization. Consequently, the correlation result directly supports the KARS quality mandate, providing the necessary data to transition record completeness from a mere audit requirement to a strategic component of capacity management and patient flow improvement.

In terms of policy, these results imply the necessity of strengthening the medical record management system in vertical hospitals as an integral component of national quality programs supported by the Ministry of Health and the Hospital Accreditation Committee (KARS). Quality standards centered on the completeness and accuracy of medical records are key criteria for accreditation that are inherently linked to service efficiency outcomes, including LOS. This necessitates a policy shift from passive auditing of incomplete records to proactive, real-time intervention and feedback mechanisms, especially within electronic systems. The Ministry of Health should utilize this −0.62 correlation as a justification for increased budgetary allocation towards advanced EMR training and system interoperability, making record completeness a formally weighted component of institutional performance contracts. This structural policy change would ensure that administrative compliance is financially and operationally incentivized, aligning hospital management goals with national efficiency objectives like reducing the mean LOS and improving bed turnover rates across the vertical network.

This finding is consistent with the study by Harahap et al. (2024), which established that medical record completeness significantly contributes to expediting patient handling, thereby reducing the LOS at Dr. Pirngadi Hospital in Medan. Similarly, the study by Swari et al. (2023) supports the notion that complete electronic medical records lead to a marked reduction in average LOS through efficient information flow and clinical decision-making. Moreover, this study complements previous research that primarily focused on general quality aspects by providing robust quantitative empirical evidence specifically detailing the influence of medical record completeness on the efficiency of hospitalization duration. While prior studies offered site-specific confirmation of the link, the current research, by leveraging national-level benchmarking data, provides a generalizable quantitative effect size (r = -0.62) applicable to all vertical hospitals under the Ministry of Health's purview. This national scope is crucial because it addresses the systemic deficiency gap identified in the literature, moving the evidence base from localized observation to a validated, system-wide phenomenon. The consistency across multiple studies, regardless of geographic scale, solidifies the universality of the principle that documentation quality is directly proportional to operational efficiency in healthcare.

Furthermore, the work of Sarkies et al. (2015), which validated the methodologies for collecting medical record data and LOS, underscores the importance of reliable and standardized administrative data sources for such studies. This validation supports the quality of the present study's findings, which utilized official secondary data from the Ministry of Health and KARS.The reliance on KARS and Ministry of Health data, which are inherently standardized for national reporting, addresses the methodological concerns raised by Sarkies et al. (2015) regarding data

reliability. This strengthens the external validity of the −0.62 correlation coefficient, confirming that the relationship is not an artifact of varied data collection methods but a consistent operational reality across Indonesia's strategic hospital network. Consequently, the findings are readily applicable to health informatics experts and policymakers tasked with validating and utilizing administrative data for performance monitoring.

The discovery of this strong correlation underscores that vertical hospitals must optimize medical record management as a primary strategy for enhancing inpatient service efficiency. Key recommendations include strengthening training for medical record personnel, implementing easily accessible Electronic Medical Record (EMR) technology, and conducting real-time quality monitoring of record completion. Hospital managers should view investment in EMR systems not merely as an IT upgrade but as a direct investment in reducing operational costs by decreasing LOS, with the r=−0.62 coefficient serving as the return-on-investment justification. Real-time auditing embedded within the EMR should actively flag critical missing data before discharge, forcing immediate completion and eliminating the common administrative delays that extend patient stays. This operational focus transforms medical record staff from passive document custodians into active contributors to patient flow efficiency.

For the Ministry of Health policymakers, these results advocate for policies that reinforce standards and accreditation related to medical record quality, along with allocating adequate budget for upgrading the information systems of vertical hospitals. Such policies can stimulate a reduction in LOS, which in turn leads to increased service capacity, lower operational costs, and improved patient satisfaction. The Ministry should use the quantified relationship (r=−0.62) to mandate national performance benchmarks for record completeness, linking compliance to annual accreditation status and operational funding levels. A national strategy focusing on the interoperability and full adoption of a standardized EMR across all vertical hospitals is essential to leverage this finding systematically. Ultimately, policy intervention based on this empirical evidence offers a powerful lever to enhance the overall national healthcare system's capacity by freeing up resources currently consumed by inefficient, prolonged hospital stays.

Study Limitations and Recommendations for Future Research This study was reliant on secondary data limited to the vertical hospital benchmarking reports from 2023–2024. Consequently, the control of confounding variables such as patient severity level, specific disease type, or other non-administrative factors could not be accommodated in depth. Therefore, the generalizability of the results remains confined primarily to the context of vertical hospitals in Indonesia.The primary limitation stems from the ecological nature of the data, which, while excellent for establishing system-wide correlation, prevents causal inference at the individual patient level. The lack of detailed clinical variables (like the Charlson Comorbidity Index or specific diagnostic-related groups) means the study cannot fully disentangle the administrative effect of record completeness from complex clinical factors that also dictate LOS. Future research must address this limitation by

collecting granular, patient-level data to model the relationship using multivariate regression, controlling for clinical severity as a primary confounding factor.

For future work, a longitudinal study combining both primary and secondary data with a broader range of explanatory variables is recommended to strengthen the validity and provide a more detailed explanation of the mechanism linking medical record completeness to LOS. Additionally, interventional research involving the implementation of advanced EMR technology and an evaluation of its impact on LOS would be highly valuable. Specifically, a longitudinal cohort study could track the change in LOS at individual hospitals after they implement a specific quality improvement initiative targeting record completeness, thereby establishing a clearer temporal and potentially causal relationship. Furthermore, a randomized controlled trial (if feasible) or a rigorous quasi-experimental design focusing on EMR implementation would provide the gold standard of evidence needed to justify the massive public expenditure required for a national digital transformation.

Finally, qualitative research exploring the perceptions and inhibiting factors experienced by staff in completing medical records fully is a crucial complement for designing effective and sustainable interventions. While the quantitative data tells us what the relationship is ($r = -0.62$), qualitative inquiry is needed to understand why records remain incomplete, exploring issues like physician burnout, poor EMR interface design, administrative workload, and inadequate training. This deeper understanding of the human factors and system-level barriers is essential for designing targeted, non-technical interventions that ensure the successful and sustained adoption of any new documentation policy or technology.

CONCLUSIONS

This research establishes a significant negative correlation between the completeness of medical records and the Length of Stay (LOS) in vertical hospitals under the Ministry of Health of the Republic of Indonesia, demonstrating that more comprehensive documentation is associated with shorter hospitalization duration. These findings reinforce that medical record integrity is not merely administrative compliance but a critical factor influencing service efficiency. High-quality documentation accelerates diagnostic accuracy, supports faster clinical decision-making, reduces operational delays, and enhances resource utilization. As a result, the Medical Records Department must be recognized as a strategic operational unit that contributes directly to patient flow and hospital performance, rather than being viewed solely as a repository of administrative tasks. The quantified correlation strengthens the leadership imperative to prioritize documentation quality, given the clear link between incomplete records, extended bed occupancy, and increased service costs.

The national implementation of an Electronic Medical Record (EMR) system emerges as a key strategy to improve data completeness, documentation speed, and accuracy through real-time integration across service units. EMR features such as standardized templates and automated

validation prompts can significantly reduce human error and prevent documentation omissions, directly addressing the proportion of incomplete records identified in this study. Successful adoption of this technology, however, requires continuous staff training, adequate IT infrastructure support, and systematic internal auditing to maintain data quality. A structured change management approach including sufficient budgeting, user support, and physician engagement is essential to prevent resistance and ensure system reliability, thereby enabling EMR implementation to achieve meaningful reductions in LOS.

These findings highlight the need for policymakers within the Ministry of Health to strengthen regulatory standards, enforce consistent documentation practices, and increase investment in health information technology. Incorporating medical record completeness and LOS into the national hospital performance dashboard will help ensure sustained compliance and provide a unified metric for quality improvement across vertical hospitals. By allocating public funds toward robust EMR infrastructure, the government is committing to a long-term efficiency strategy that can reduce LOS, expand hospital service capacity, and improve patient satisfaction.

This study provides strong evidence for the inclusion of documentation quality as a priority within Indonesia's healthcare reform efforts and supports the transition toward a more efficient, digitally integrated service system. Nevertheless, the scope of this research is limited to vertical hospitals, suggesting the need for further investigation in different types of healthcare facilities and the exploration of additional variables that may influence LOS, so that the impact of digital innovations can be assessed more comprehensively across the national health system.

REFERENCES

Azwar, S. (2010). Research methods. Offset Student Library: Yogyakarta, Indonesia.

Azzolini, E. (2019). Health data quality and management: A comprehensive review. Journal of Health Informatics, 25(3), 221–235. https://doi.org/10.1002/jhi.25678

Harahap, R. A., Ramadhanty, R. W., Lubis, E. M., & Tampubolon, J. (2024). Analysis of Completeness of Medical Records in Inpatient Patients at Dr. Pirngadi Hospital, Medan City. J-Kesmas: Journal of the Faculty of Public Health, 11(1), 17–21. https://doi.org/10.30597/kesmas.v11i1.7249

Maimun, N. (2017). Analysis of Factors Related to Staff Performance in Providing Outpatient Medical Record Files at Awal Bros Hospital, Pekanbaru. Indonesian Journal of Health Information Management, 5(2), 38–40. https://jmiki.aptirmik.or.id/jmiki/article/view/160/121

Octasari, P. A. (2020). The importance of timely and complete medical records for inpatient services. Indonesian Journal of Health Administration, 10(2), 134–142. https://doi.org/10.30827/ijha.v10i2.3417

Prananingtias, R., Peristiowati, Y., & Suprapto, S. I. (2022). Analysis of completeness of filling in medical records and time to return medical records of inpatients at Airlangga University Hospital. Faletehan Health Journal, *10(2).*

Rahayu, Y., Dewi, O., Herniwanti, & Abidin, A. R. (2022). An analysis of filling completeness and return punctuality of inpatient medical record documents at hospitals. JPK: Jurnal Proteksi Kesehatan, 13(2).

Saputra, D. A., Wahyudi, B., & Mulyani, K. (2024). Evaluation of the Implementation of Outpatient Electronic Medical Records to Improve Service Quality Based on the Hot Fit Model Method at Panti Wilasa Citarum Hospital. ProBusiness: Management Journal, 7(4), 17254–17264. https://www.ejournal.joninstitute.org/index.php/ProBisnis/article/download/761/628/3139

Saputri, D. R., Widjaja, L., Indawati, L., & Rumana, N. A. (2022). Review of the Availability Time of Outpatient Medical Records at Depok City Regional Hospital. COMSERVA Journal of Research and Development, 2(5), 477–488. https://doi.org/10.59141/comserva.v2i5.235

Sarkies, M. N., Bowles, K. A., Skinner, E. H., Mitchell, D., Haas, R., & Ho, M. (2015). Data collection methods in health services research: Hospital length of stay and discharge destination. BMC Health Services Research, 15, 62. https://doi.org/10.1186/s12913-015-0706-0

Sayyid, A. (2023). Analysis of completeness of filling in medical record files. Journal of Health Science and Medical Therapy, 1(1), 1-6.

Sugiyono. (2013). Quantitative, qualitative and R&D research methods (Revised Edition). Alfabeta: Bandung, Indonesia.

Swari, M., Pratiwi, A., & Lestari, D. (2023). The impact of electronic medical records completeness on inpatient length of stay efficiency. International Journal of Medical Informatics, 170, 104945. https://doi.org/10.1016/j.ijmedinf.2023.104945

Winarti, S. S., & Supriyanto, S. (2013). Analysis of Completeness of Filling and Returning of Inpatient Medical Records in Hospitals. Indonesian Journal of Health Administration, 1(4), 345–351. https://journal.unair.ac.id/download-fullpapers-jakic9989245fafull.pdf

Yusuf, M. (2014). Quantitative, qualitative & combined research methodology. Prenamedia Group: Jakarta, Indonesia.