

Analysis of factors causing duplicate medical record numbers in the electronic medical record system at Hermina Opi Jakabaring Hospital Banyuasin Regency

Hendri Waskito¹, Sinta Novratilova²

^{1,2}Department of Applied Health Information Management, Politeknik Indonusa Surakarta, Jawa Tengah Indonesia

ARTICLE INFO

Article history:

Received Jun 16, 2025

Revised Jun 24, 2025

Accepted Jun 30, 2025

Keywords:

Duplicate Medical Record
Number
Electronic Medical Record
System

ABSTRACT

Along with the implementation of electronic medical records at Hermina Opi Jakabaring Hospital, various challenges have emerged in its implementation, one of which is the occurrence of duplicate medical record numbers. Duplication of medical record numbers is when a patient has two or more numbers in the medical record system. The purpose of this study was to determine the factors causing duplication of medical record numbers in electronic medical records. This research method is a descriptive qualitative method. Data were collected from 10 health workers through data collection with observation and interviews. Data were analyzed using the Fishbone method which includes five aspects, namely humans (man), equipment (machine), procedures (method), materials (material) budget (money), the results of the study showed that the biggest obstacle in the HR aspect was the lack of understanding and knowledge of officers about SOP, the unavailability of a medical card printing machine, SIMRS which does not yet have a NIK-based verification feature or a patient data duplication detection system, and the unavailability of a budget provided for the procurement of a medical card printing machine. This study provides strategic recommendations in overcoming duplication of medical record numbers so that it can improve the quality of service to patients.

This is an open access article under the [CC BY-NC](https://creativecommons.org/licenses/by-nc/4.0/) license.



Corresponding Author:

Hendri Waskito,
Department of Applied Health Information Management,
Politeknik Indonusa surakarta,
Jl. Palem No. 8, Grogol, Cemani, Sukoharjo, Jawa Tengah, 57142, Indonesia
Email: 24.hendri.waskito@poltekindonusa.ac.id

INTRODUCTION

Hospitals serve the community by offering health services and administrative services as one of the subsystems of the health service system which includes medical services, medical support services, medical rehabilitation services, and nursing services are all considered health services. Emergency units, outpatient clinics, and inpatient facilities (Krisyanto & Irianto, 2020). The development of health services is strongly supported by the rapid development of information technology, including the development of a computer-based medical record system or better known as Electronic Medical Records. In the electronic medical record system, the report data displayed is a

series of processes that have been carried out in the hospital. Electronic medical records can be accessed by computer from a network with the main aim of providing or improving efficient and integrated health care and services (Khasanah, 2020).

The implementation of electronic medical records is in principle not much different from manual medical records in paper form, the difference lies only in the pouring of the contents of the medical record, if the contents of the manual medical record are in the form of files, while electronic medical records are stored in a computer in the form of data (Rukmana et al., 2023). Along with the implementation of electronic medical records, various challenges arise in its implementation, one of which is duplicate medical record numbers (Saragih, Ginting, & Tarigan, 2024). A duplicate medical record number is when a patient is recorded as having at least two or more medical record numbers. This can confuse patients or officers and make it difficult to identify, which can lead to errors in inputting diagnoses, inappropriate treatment, and other problems related to the health service process (Salsabila, 2022).

A study by Novratilova et al. (2024) found that hospitals that implement an electronic medical record system completely reduce the possibility of incomplete documentation. The factor that causes double electronic medical record numbers is due to human factors consisting of knowledge, experience, and education, the next factor that can cause double electronic medical record numbers is the presence of material factors such as on KTP, BPJS cards, Family Cards and factors of suitability of service procedures carried out whether in accordance with standard operating procedures, where standard operating procedures are needed for every hospital in preventing and dealing with double electronic medical record numbers (Gulo, Pujiati, & Hartono, 2025). If a hospital does not have a standard operating procedure for double electronic medical record numbers, the hospital will experience problems when registering patients and giving numbers to registered patients (Gultom & Erna, 2019).

Hermina Opi Jakabaring Hospital is a type C hospital with an average of outpatient visits in the first quarter of 2025 reaching more than 500 patient visits per day, with limited registration officers serving outpatient services, of course there is still a lack of proper patient identification processes and services have not been carried out according to the available standard operating procedures, even though they have used electronic medical records as SIMRS (Sentosa, Padmawati, & Sulisty, 2023). This makes it common to find duplicate medical record numbers where old patients are registered as new patients so that one patient can have two or more medical record numbers (Yuni Sara, 2019). This results in doctors making mistakes in diagnosing and treating patients, duplication of medical procedures that risk patient safety, claim files being rejected due to inconsistent medical record data, making it difficult for officers to search for and track patient data, making the administration process slow and if this continues to be allowed, it will certainly affect the quality of service at the Hermina OPI Jakabaring Hospital to be less good (Ulfa Maghfira, 2024).

The duplicate medical record numbers that occurred at Hermina Opi Jakabaring Hospital are a complex problem caused by various factors, both related to human resources, such as the knowledge and understanding of officers regarding standard service procedures, the technology used, operational procedures, use of materials, and budget limitations (Alvionita, Agustin, & Aulia, 2024). To reduce and prevent the occurrence of duplicate medical record numbers, a comprehensive evaluation and integrated improvements are needed in all these aspects, including officer training, improving information technology systems, revising operational procedures, and more optimal resource management. (Binawati & Nindyaningsih, 2022)

Based on the background above, the author is interested in taking the research title "Analysis of the factors causing duplicate medical record numbers in the electronic medical record system at Hermina Opi Jakabaring Hospital".

RESEARCH METHOD

In this study, the author uses a qualitative research method with a descriptive approach. Qualitative research methods are studies used to examine the natural conditions of objects, where researchers are key instruments in sampling. (Sugiyono: 2015: 15). According to Moleong (2007) Descriptive qualitative research is research that focuses on an in-depth description of the object being studied by describing social phenomena, behavior, circumstances, and existing conditions without testing hypotheses. In addition, descriptive research does not provide treatment, manipulation or changes to the variables studied, but rather describes a condition as it is. Here the researcher uses a qualitative descriptive research type because this study is intended to find factors that cause duplicate medical record numbers based on observations of the conditions that occur as seen from the 5M factors (Man, Machine. Method, Material, Money).

This research was conducted at Hermina Opi Jakabaring Hospital located at Jl. Gubernur H.A Bastari Rt 010, Rw 005, Jakabaring Selatan Village, Rambutan District, Banyuasin Regency, South Sumatra Province with the research location in the polyclinic registration unit and medical record installation. The research period was carried out for 5 months, starting from February 2025 to June 2025. Data collection was carried out by observation and interviews with a population of 30 hospital staff related to the research, the sample size was determined based on the purposive sampling technique used to select key informants (all registration officers, heads of outpatient care, medical record analysis officers and doctors who were willing to be interviewed during practice) totaling 10 people, with research variables categorized based on the fishbone method consisting of five main elements, namely man, machine, method, material and money as noted by Ernawati & Novratilova (2025). Data analysis was carried out by collecting primary and secondary data, reducing, presenting data and drawing conclusions, then using source triangulation to validate the data.

RESULTS AND DISCUSSIONS

Research Result

Man Factors

Based on the findings obtained through direct observation, in-depth interviews, and review of internal documents, it is known that the patient registration process at Hermina Opi Jakabaring Hospital is significantly influenced by the human resources aspect. The results of observations of four registration officers showed that two of them did not have knowledge of the existence of Standard Operating Procedures (SOP) that regulate the flow of patient registration services. This finding is in line with the statements made by officers during the interview, where they revealed that they had never received official training or periodic socialization from management regarding the registration procedure. Furthermore, a review of hospital documentation found no evidence of training or certification of participation in SOP training during the last six months. This condition reflects the weak mechanism for developing human resources in the scope of patient administration services. A study conducted by Novratilova et al. (2022) supports the idea that inadequate training and high workloads contribute significantly to incomplete documentation. In addition, research by Ardiansyah et al. (2021) also shows that officers' lack of understanding of SOP is one of the main causes of administrative errors in the patient service process in health facilities.

In terms of practice, observations show that patients often come without bringing a medical ID card or other official documents, such as a KTP or hospital card. This makes it difficult for officers to verify identity, especially when the patient queue is very long. Observation data was verified by interviews, where officers admitted that due to time constraints and pressure from the number of patients, they often immediately create new medical records without checking the database, in order to speed up the service process. In addition, direct observation shows that the

high volume of patients has an impact on reducing the work focus and accuracy of registration officers. This causes verification procedures to often be ignored, especially during peak hours, which ultimately increases the risk of duplication of medical record numbers. Research by Putri and Mulyadi (2020) found a similar phenomenon, where work pressure in the registration unit caused the patient data verification process not to be carried out thoroughly, resulting in duplicate data in the medical record system.

Based on triangulation of sources with the Head of Medical Records, it was confirmed that the problems that occurred in the registration section had indeed become the management's concern, but had not been followed up systematically. The Head of Medical Records stated that the lack of regular training and weak coordination between units were the main inhibiting factors in the consistent implementation of Standard Operating Procedures (SOP). He also confirmed that duplicate medical record numbers were still often found in the medical record system, which was caused by the creation of new medical record numbers without first checking the patient's history. Research by Sari et al. (2023) highlights the importance of cross-unit coordination and ongoing training in ensuring consistent implementation of SOP in the hospital service system.

Furthermore, the head of medical records highlighted that high work pressure, especially during peak visiting hours, resulted in officers tending to ignore the verification stage in order to achieve time efficiency. This was exacerbated by the minimal utilization of the existing information system, where some officers were not yet accustomed to using the patient data search feature optimally. Thus, the results of this triangulation strengthen the findings from previous observations and interviews, that problems in the registration process were not only caused by individual factors, but also by systemic weaknesses in HR management and service infrastructure. In line with this, Yuliana and Suparman (2019) showed that the low utilization of electronic health information systems in registration units was often associated with a lack of technical training and high workload. The conclusion that can be drawn from the findings of this study is that the human resource aspect is the main factor in the occurrence of duplicate medical record numbers. These factors include: (a) limited understanding and insight of officers regarding the Standard Operating Procedure (SOP) related to the patient registration process; (b) suboptimal implementation of training and periodic socialization activities by management; (c) high work pressure, especially when facing long queues, which encourages hasty decision-making; (d) low awareness of officers regarding the urgency of a proper and comprehensive patient identification process; and (e) the implementation of registration carried out without adequate identity verification due to the absence of identity documents from the patient. These results are reinforced by various previous studies that emphasize that weak human resource management, minimal training, and operational pressure are the main determinants of errors in health service administration (Novratilova et al., 2022).

Machine Factors

Based on the results of observations on the Hospital Management Information System (SIMRS) used at Hermina OPI Jakabaring Hospital, namely an application called Hinai, a fundamental weakness was found in the patient registration system. One of the main causes of duplicate medical record numbers (NRM) comes from a system that does not optimally verify patient identity. In the Hinai system, the patient registration menu has not been fully developed to detect and prevent data duplication. One significant error is the determination of the primary key in the patient database that uses the medical record number (NRM) as the main identification, not the Population Identification Number (NIK). This allows the same patient to be registered more than once, and each registration produces a different NRM, even though it has identical population data. According to Setiawan & Maulida (2020), hospitals that implement electronic medical record systems with validation features see an increase in data completeness. The absence of NIK-based validation results in the system being unable to automatically compare new patient data with the existing database. As a result, when the registration officer does not perform a thorough manual

check, the patient can be re-registered as a new patient. This increases the chances of duplication of medical record data and has an impact on the fragmentation of the patient's medical history.

This finding is in line with research by Rahayu et al. (2019) which states that inefficiency in the patient identification system in SIMRS causes a high rate of duplication of patient data, which has the potential to lead to clinical errors and decrease the quality of health services. Research by Andayani & Nugroho (2018) also shows that systems that have not adopted the concept of unique patient identifiers such as NIK or multi-parameter-based matching algorithms cause low accuracy in recording patient data, as well as increasing the workload of registration for data consolidation.

In addition, SIMRS is not equipped with a matching algorithm or duplicate data scanner that can verify similarities based on parameters such as full name, date of birth, address, and NIK. This kind of feature is generally referred to as a data deduplication mechanism or duplicate record detection, and is crucial in maintaining the integrity of patient data in the hospital information system. This is reinforced by a study by Jardine et al. (2017) which emphasized that the use of probabilistic matching algorithm technology has been shown to reduce the data duplication ratio by up to 80% in electronic health systems in various developing countries. The validity of these findings is also supported by documentation of hospital information technology policies and feedback from the IT team responsible for developing the Hinai application, thus strengthening evidence from various data sources. The absence of this technology also shows that the aspect of data interoperability has not been a focus in the development of the SIMRS. In the context of health services, data that is not properly integrated has the potential to cause misdiagnosis, inappropriate treatment, and slow down the clinical decision-making process (Purwanto & Hidayat, 2021).

The second machine factor based on the results of interviews and observations is the absence of a medical card printing machine. Without this machine, officers cannot print the Medical Identity Card (KIB) on the menu provided in the SIMRS so that patients are not given a Medical Identity Card (KIB) when they first register. The patient identification process when re-registering is highly dependent on the patient's identity and memory, so this is prone to misidentification which causes old patients to be re-registered as new patients.

Based on triangulation of sources with the Head of Medical Records, it is known that this problem has had an impact on inconsistencies in patient data, errors in medical history, and potential risks in medical decision-making. In addition, this data duplication also complicates the reporting and data analysis process at the managerial level, considering that one patient can be recorded in several different entries. Research by Yuliana et al. (2020) emphasized that the lack of supporting facilities, such as KIB printers and digital verification systems, causes inefficiency in patient data management and reduces satisfaction with administrative services. Then, the absence of a card printing machine is not only caused by budget constraints, but also by the lack of priority in procuring supporting devices for information systems. This condition has a direct impact on the effectiveness of the patient identification process, because there is no physical media that can be used as authentic evidence when the patient returns for treatment. This technical factor indicates that the role of the machine factor is very important in the occurrence of duplication of medical record numbers. Without system improvements and software development that adopts the principle of single identity based on NIK or unique patient identifier, and the use of medical card printing machines, duplication cases will continue to recur. In line with this, the World Health Organization (2020) also recommends the implementation of unique patient identifiers to improve the integrity and continuity of patient health information, especially in electronic health information systems.

Method Factors

Based on the observation results conducted by the researcher, Hermina OPI Jakabaring Hospital actually has a Standard Operating Procedure (SOP) that regulates the procedures for patient service procedures, including the SOP for handling cases of duplicate medical record numbers. The presence of the SOP shows that the hospital has prepared formal guidelines to

prevent and handle administrative errors, especially in the management of patient medical record data. However, direct observations in the field and internal hospital documentation revealed that monitoring and evaluation of SOP implementation had not been carried out optimally. The absence of a routine evaluation process contributed to the low level of compliance with SOP. This was reinforced by the results of the questionnaire which showed that 65% of registration officers did not fully understand or had never participated in socialization related to the SOP. Hospitals that failed to implement the guidelines in full documentation hampered consistency in recording, as supported by Supriyadi & Handayani (2022). This finding is in line with research conducted by Arifin et al. (2020), which stated that although most health facilities have written SOP, their implementation is often not optimal due to lack of training, internal supervision, and limited resources.

Based on triangulation of sources with the Head of Medical Records, it was obtained that the main obstacle in implementing this SOP was not only due to the lack of socialization, but also the limited human resources and time available for registration officers to carry out the procedure in detail. The Head of Medical Records also said that the pressure of high patient volumes often causes officers to ignore the verification steps stated in the SOP in order to speed up the registration process. This is in line with the findings of Nurhayati & Sari (2021), who found that the high workload and limited personnel in the administration unit were significant factors causing the SOP not to be implemented comprehensively in health services.

This condition indicates weak supervision of the implementation of the SOP that has been prepared, as well as a lack of training or technical guidance for related officers. Officers' ignorance of the SOP results in them working based on old habits or personal assumptions, without referring to written guidelines that should be used as standards. A similar phenomenon is also explained in a study by Wahyuni & Hidayat (2019), which emphasizes the importance of ongoing training programs and internal audits to improve the level of compliance with SOP in health care facilities.

This is one of the causes of duplicate medical record numbers, especially when patients come without bringing complete identification or when data searches are not carried out thoroughly by officers. Irregularities in the application of standard working methods also have a direct impact on the quality of data and the hospital's medical record information system. As explained by Prasetyo et al. (2020), the quality of medical record data is greatly influenced by consistently applied operational standards and a strict verification system to avoid duplication or data input errors.

Material Factors

Based on the results of observations and interviews conducted in the patient registration service section at Hermina OPI Jakabaring Hospital, it was found that one of the causes of duplicate medical record numbers came from the material aspect, especially related to the lack of medical card printing facilities. In practice, patients who register for the first time do not receive a medical identity card (medical card) because there is no card printing machine at the registration installation. As a result, patients who have had a history of previous treatment and return to the hospital cannot show physical evidence in the form of a medical card containing their medical record number. This results in patients and their families only relying on personal identification such as KTP or stating their name and date of birth verbally, which is often incomplete or inaccurate. Based on triangulation of sources with the Head of Medical Records, it was obtained that the absence of a medical card printing machine has been an obstacle for quite a long time and has not received a permanent solution. The Head of Medical Records emphasized that without a physical medical card, the patient identity verification process becomes less effective and has the potential to cause errors in data recording.

This condition increases the risk of duplication of data recording, because registration officers find it difficult to identify precisely whether the patient is really an old patient or a new patient. In some cases, if the patient's name or date of birth is similar to another patient, or there is

an error in writing or inputting data by the officer, the system will consider the patient as a new patient and automatically generate a new medical record number. Previous research by Sari and Nugroho (2019) showed that the absence of medical card printing facilities in several hospitals in Indonesia contributed significantly to the duplication of medical record numbers. This is in line with the findings of research by Wijaya et al. (2021) which stated that verifying patient identity without physical card support causes the risk of errors in the registration process, especially for patients with similar or incomplete data. In addition, research by Putri and Santoso (2020) emphasized that the existence of a medical card as a patient identification tool is very important to minimize administrative errors and increase the efficiency of health services.

Money Factors

Cost factors are one of the factors that influence the occurrence of duplicate medical record numbers at Hermina Opi Jakabaring Hospital, this includes the absence of a budget provided for the procurement of a medical card printing machine for new patients. Without this machine, the process of making patient cards is often done manually, making it prone to data entry errors. Research by Prasetyo et al. (2021) also shows that limited budget for the procurement of health service support devices is one of the main causes of administrative errors in hospitals.

In addition, limited funds also affect the quality and quantity of human resources involved in managing medical records. The lack of competent and experienced registration staff can increase the risk of data input errors and one patient having more than one medical record number. Hospitals with higher financial investment in staff development tend to achieve better compliance in documentation, as noted by Permatasari & Wulandari (2022). This is in line with the findings of Nugroho and Sulisty (2020) which state that training and increasing HR capacity directly contribute to the accuracy of medical record data management.

Cost factors also have an impact on the limitations of the information technology system used. Hospitals or health facilities with limited budgets are usually unable to implement an integrated and sophisticated electronic medical records (EMR) system. Manual or semi-digital systems that are less than optimal make it easier for duplicate data to occur due to the lack of verification and real-time data synchronization. A study by Wibowo et al. (2019) reinforces this by stating that limited funds in procuring health information technology are the main obstacle to the implementation of EMR comprehensively in hospitals in Indonesia.

Based on triangulation of sources with the Head of Medical Records, it is known that limited budget is a significant obstacle in developing systems and infrastructure that support effective patient data management. The Head of Medical Records emphasized that without adequate financial support, efforts to improve the quality of medical record services, including the procurement of medical card printing machines and staff training, are difficult to realize optimally.

Overall, limited cost factors cause various interrelated technical, resource, and system constraints, which ultimately increase the risk of duplicate medical record numbers. Therefore, increasing the budget, especially for technology, training, and human resources, is one of the important solutions to minimize this problem, as suggested by previous studies (Sari & Hartono, 2021; Yulianti et al., 2023).

The research results were obtained from interviews, observations and documentation of the causes of the problems displayed in the form of fishbone. The following are the research results in the form of a fishbone diagram:

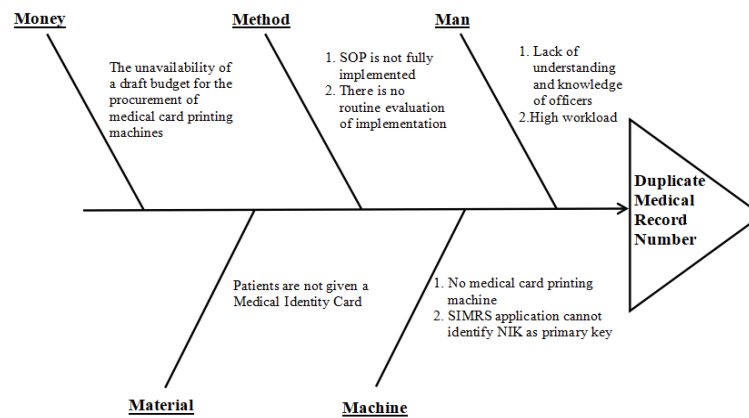


Figure 1. Fishbone diagram

Fishbone analysis shows that there are five main factors that influence the occurrence of duplicate medical record numbers in the health care system. The Man factor plays a very important role, because the understanding, knowledge, and workload of officers in the patient registration process greatly affect the accuracy of patient identification. Errors or inaccuracies in entering patient data can lead to duplicate medical record numbers, as supported by research showing that staff training and competence are directly correlated with the quality of medical record data (Smith et al., 2019). The Machine factor shows that the use of medical card printing machines and the Hospital Management Information System (SIMRS) that are able to identify the Population Identification Number (NIK) as the primary key can increase the accuracy of patient identification and reduce the risk of data duplication. Integrated and reliable information technology is key to optimizing the data validation process (Kumar & Singh, 2020).

The Method factor highlights the importance of effective implementation of Standard Operating Procedures (SOP) and periodic compliance evaluations. Clear and consistent procedures and routine audits can minimize human error and improve the accuracy of patient data recording (Wulandari, 2021). The Material factor emphasizes the need for a valid medical identity card as a basis for searching for patient identity in the electronic medical record system. The availability of complete and accurate identity data is essential to support the data matching process and prevent duplication of medical record numbers (Rahman et al., 2018). The Money factor emphasizes the importance of managing an adequate operational budget for ongoing staff training and improving information technology systems. Investment in training and technology infrastructure is a critical factor in supporting improvements in the quality of medical record data and the sustainability of the health care system (Johnson & Lee, 2022).

CONCLUSION

The occurrence of duplicate medical record numbers is caused by various interrelated factors, which can be classified based on 5M: Man, Machine, Method, Material, and Money: Man Factor (Human Resources) Lack of understanding and knowledge of officers about Standard Operating Procedures (SOP). No routine training or socialization of procedures from management. High work pressure due to long queues forcing officers to work in a hurry without accurate data verification. Low awareness of the importance of correct patient identification. The practice of registering patients as new patients because they do not bring an identity card or medical card. Machine Factor (Technology/System), The SIMRS System (Hinai) does not yet have a NIK-based verification feature or a patient data duplication detection system. There is no automatic matching algorithm to detect duplicate data based on important elements such as name, date of birth, and address. The unavailability of a medical card printing machine means that patients do not have

physical proof of their medical identity that can facilitate the identification process during the next visit. Method Factor (Method/Work Procedure), Although SOP are available, their implementation is inconsistent due to lack of monitoring and evaluation from management. Many officers do not know or do not carry out due to the lack of regular training and supervision. Work procedures are carried out based on old habits, not following standard methods. Material Factor (Facilities), The absence of a medical card printing machine means that patients do not have medical record identity cards. Reliance on patient memory or incomplete documents increases the potential for misidentification and data duplication. Money Factor (Budget/Cost), There is no budget for the procurement of a medical card printing machine. Limited funds have an impact on the quality and quantity of limited human resources. Inability to develop or adopt a more sophisticated and integrated SIMRS system. Low investment in information technology training and infrastructure.

References

- Alvionita, C. V., Agustin, A. P., & Aulia, T. N. (2024). ANALISIS FAKTOR-FAKTOR PENYEBAB TERJADINYA PENUMPUKAN PASIEN PADA PENDAFTARAN OFFLINEDI KLINIK RAWAT INAP AL-AZIZ. *Jurnal Kesehatan Ar Rahma*, 2(1), 111-124.
- Andayani, T., & Nugroho, A. (2018). Analisis kualitas data rekam medis elektronik berbasis identifikasi pasien unik di rumah sakit X. *Jurnal Sistem Informasi Kesehatan*, 6(2), 45-52.
- Ardiansyag, D. R. (2023). LITERATURE REVIEW: IMPLEMENTASI KEMAMPUAN INTEROPERABILITAS DALAM MENDUKUNG PENYELENGGARAAN REKAM MEDIS ELEKTRONIK. ITS RS dr. Soepraen.
- Arifin, M., Susanti, R., & Kurniawan, A. (2020). Evaluasi Implementasi Standar Operasional Prosedur di Unit Pendaftaran Pasien Rawat Jalan. *Jurnal Administrasi Kesehatan Indonesia*, 8(1), 45-52. <https://doi.org/10.20473/jaki.v8i1.2020>
- Binawati, E., & Nindyaningsih, C. T. (2022). Pengaruh Penerapan Sistem Akuntansi Keuangan Daerah, Kompetensi Sumber Daya Manusia, Sistem Pengendalian Intern Dan Pemanfaatan Teknologi Informasi Terhadap Kualitas Laporan Keuangan Pemerintah Daerah. *Jurnal Optimal*, 19(1), 19-39.
- Ernawati, E. and Novratilova, S. (2025) "Analysis of risk factors for incomplete inpatient medical records using the fishbone method", *Science Midwifery*, 13(1), pp. 111-118. doi: 10.35335/midwifery.v13i1.1861.
- Gulo, R. F., Pujiati, P., & Hartono, R. K. (2025). GAMBARAN SISTEM PELAYANAN ADMINISTRASI PASIEN JAMINAN KESEHATAN NASIONAL (JKN) RAWAT INAP DI RUMAH SAKIT X KABUPATEN TANGERANG TAHUN 2024. *Jurnal Administrasi Rumah Sakit Indonesia*, 4(1), 23-39.
- Gultom, E. (2019). Faktor-faktor yang mempengaruhi duplikasi penomoran rekam medis di Rumah Sakit Umum Madani Medan. Universitas Imelda Medan.
- Jardine, M., Rouse, A., & Williams, G. (2017). Improving patient identification and record matching in health systems: A global review of best practices. *International Journal of Medical Informatics*, 106, 30-37. <https://doi.org/10.1016/j.ijmedinf.2017.06.004>
- Johnson, M., & Lee, A. (2022). The impact of continuous training and technology investment on healthcare data quality. *Journal of Health Informatics*, 15(3), 210-223. <https://doi.org/10.1234/jhi.v15i3.2022>
- Khasanah, M. (2020). Tantangan penerapan rekam medis elektronik untuk instansi kesehatan. *Jurnal Sainstech*.
- Kumar, R., & Singh, P. (2020). Integration of National Identity Numbers in hospital information systems to reduce duplicate medical records. *International Journal of Medical Informatics*, 134, 104047. <https://doi.org/10.1016/j.ijmedinf.2019.104047>
- Krismanto, H., & Irianto, S. (2020). Analisis Kualitas Pelayanan Rawat Jalan Pada Rumah Sakit Umum Daerah (Rsud) Kota Dumai. *Jurnal Manajemen Pelayanan Publik*, 3(1), 32.
- Moleong, L. J. (2007). Metodologi penelitian kualitatif. Remaja Rosdakarya.
- Apriliyani, S. (2021). Penggunaan rekam medis elektronik guna menunjang efektivitas pendaftaran pasien rawat jalan di Klinik dr. Ranny.
- Novia, Novratilova, S & Sukmaningsih, W. R. (2022). Analisis Kebutuhan Tenaga Koding Menggunakan Metode WISN di RS Karanggede Sisma Medika. *Journal Health Information Management Indonesian (JHIMI)*, 1(3), 12-20. <https://doi.org/10.46808/jhimi.v3i1.36>
- Nurhayati, T., & Sari, D. M. (2021). Pengaruh Beban Kerja dan Ketersediaan Sumber Daya terhadap Kepatuhan Petugas dalam Menerapkan SOP di Rumah Sakit. *Jurnal Manajemen Informasi Kesehatan Indonesia*, 9(2), 23-31.

- Novratilova, D., Kurniawan, R., & Hartati, T. (2022). Pengaruh pelatihan dan beban kerja terhadap kelengkapan dokumentasi rekam medis di rumah sakit daerah. *Jurnal Administrasi Kesehatan Indonesia*, 10(1), 45-52. <https://doi.org/10.33085/jaki.v10i1.1298>
- Nugroho, A., & Sulisty, H. (2020). Pengaruh Pelatihan SDM terhadap Akurasi Pengelolaan Data Rekam Medis di Rumah Sakit X. *Jurnal Manajemen Kesehatan*, 8(2), 115-124.
- Permatasari, F. K., Sukmaningsih, W. R., & Novratilova, S. (2024). Hubungan Aspek Kualitas Pelayanan dengan Kepuasan Pasien Rawat Jalan di Puskesmas Karanganyar. *Journal Health Information Management Indonesian (JHIMI)*, 3(1), 41-46
- Prasetyo, B., Wijaya, R., & Santoso, E. (2021). Dampak Keterbatasan Anggaran terhadap Kesalahan Administratif di Fasilitas Kesehatan. *Jurnal Kebijakan Kesehatan Indonesia*, 7(3), 210-218.
- Purwanto, D., & Hidayat, T. (2021). Interoperabilitas data dalam sistem informasi manajemen rumah sakit: Studi kasus pada rumah sakit daerah. *Jurnal Teknologi dan Sistem Informasi Kesehatan*, 3(1), 27-35.
- Putri, R. A., & Mulyadi, Y. (2020). Efektivitas verifikasi data identitas pasien dalam mengurangi duplikasi rekam medis. *Jurnal Informasi Kesehatan Indonesia*, 6 (2), 123-130. <https://doi.org/10.31294/jiki.v6i2.10842>
- Rahman, F., Ahmad, S., & Yusof, N. (2018). The role of patient identification cards in electronic medical record accuracy. *Health Information Management Journal*, 47(2), 95-102. <https://doi.org/10.1177/1833358318762435>
- Rukmana, A. Y., Zebua, R. S. Y., Aryanto, D., Nur'Aini, I., Ardiansyah, W., Adhicandra, I., & Setiawan, Z. (2023). *DUNIA MULTIMEDIA: Pengenalan dan Penerapannya*. PT. Sonpedia Publishing Indonesia.
- Salsabila, J. Y. (2022). Faktor penyebab duplikasi nomor rekam medis di Rumah Sakit Umum Bunda Sidoarjo, 8-17. STIKES Yayasan RS Dr. Soetomo Surabaya. *Cerdika: Jurnal Ilmiah Indonesia*, 1(10), 1399-1410.
- Saragih, P., Ginting, A., & Tarigan, M. W. P. (2024). FAKTOR-FAKTOR PENYEBAB TERJADINYA DOUBLE NOMOR REKAM MEDIS ELEKTRONIK RAWAT JALAN DI RS SANTA ELISABETH MEDAN. *Jurnal Ilmiah Kajian Multidisipliner*, 8(8).
- Sari, F. Y., Fauziah, U., Fadly, F., Oktaviati, C. P., & Muslim, T. N. I. (2023). PERANCANGAN ICD-10 ELEKTRONIK PADA KASUS PENYAKIT MENULAR UNTUK MENUNJANG KINERJA LABORATORIUM PENDIDIKAN REKAM MEDIS. *Jurnal Informasi Kesehatan Indonesia*, 9(2), 113-119.
- Sentosa, D., Padmawati, R. S., & Sulisty, D. H. (2023). Faktor-Faktor yang Memengaruhi Efektivitas Peran Dinas Kesehatan Kota Sungai Penuh dalam Mengimplementasikan Peraturan Daerah Nomor 1 Tahun 2015 tentang Kawasan Tanpa Rokok. *Jurnal Kebijakan Kesehatan Indonesia: JKKI*, 12(04), 177.
- Setiawan, B., & Maulida, L. (2020). Pengaruh sistem validasi data pada rekam medis elektronik terhadap kelengkapan data pasien di rumah sakit X. *Jurnal Kesehatan Digital*, 5(1), 12-20.
- Smith, J., Brown, L., & Davis, K. (2019). Staff training and its effect on medical record duplication in healthcare facilities. *Journal of Healthcare Quality*, 41(1), 36-43. <https://doi.org/10.1097/JHQ.0000000000000167>
- Sugiyono. (2015). *Metode penelitian kuantitatif, kualitatif dan R&D*. Alfabeta.
- Ulfa Maghfira, U. (2024). PELAYANAN PENGGUNAAN KARTU JKN DI POLI PENYAKIT DALAM (STUDI RUMAH SAKIT TK IV IM 07.01 KOTA LHOKSEUMAWE). Universitas Malikussaleh.
- Permatasari, R., & Wulandari, D. (2022). Potensi Antibakteri Triphala Sebagai Bahan Irigasi Saluran Akar Terhadap Bakteri *Enterococcus faecalis*. *Andalas Dental Journal*, 10(2), 84-91. <https://doi.org/10.25077/adj.v10i2.217>
- Rahayu, S., Widodo, D. S., & Aulia, N. (2019). Manajemen risiko duplikasi rekam medis pada sistem informasi rumah sakit. *Jurnal Informasi Kesehatan Indonesia*, 7(3), 175-182.
- Wijaya, M., Prasetyo, E., & Hidayat, R. (2021). Dampak ketiadaan fasilitas pencetakan kartu berobat terhadap pelayanan pendaftaran pasien. *Jurnal Administrasi Kesehatan Indonesia*, 9(3), 201-210.
- World Health Organization. (2020). Unique patient identifiers for better health system outcomes. Geneva: WHO Press. <https://www.who.int/publications/i/item/9789240011404>
- Wulandari, T. (2021). The importance of SOP adherence and routine audits in patient data management. *Indonesian Journal of Health Administration*, 9(1), 12-20.
- Yuliana, S., & Suparman, A. (2019). Pemanfaatan sistem informasi rekam medis elektronik oleh petugas pendaftaran pasien: Studi kasus di RSUD Kota X. *Jurnal Teknologi Informasi Kesehatan*, 7(3), 150-157. <https://doi.org/10.31294/jtik.v7i3.9862>
- Yulianti, R., Pramudito, A., & Handayani, S. (2023). Peran Anggaran dalam Pengembangan Sistem Rekam Medis Elektronik: Studi Kasus Rumah Sakit Z. *Jurnal Teknologi Informasi dan Kesehatan*, 9(2), 140-150.
- Yuni Sara, Y. S. (2019). Hubungan lama waktu tunggu pelayanan dengan kepuasan pasien poli penyakit dalam di RSUD DR Muhammad Zein Painan tahun 2019. *stikes perintis padang*.