JAMBURA JOURNAL OF HEALTH SCIENCE AND RESEARCH
P-ISSN (*2623-0674*), E-ISSN (*2655-643X*)
https://ejurnal.ung.ac.id/index.php/jjhsr/index

FRONT OFFICE STAFF COMPETENCY IN HOSPITAL INFORMATION SYSTEMS: BARRIERS AND ADAPTATION STRATEGIES IN AN INDONESIAN HOSPITAL

Kurniati Nawangwulan[1]*, Vivi Magfiroh[2], Yuli Restiyanti[3], Nur Alam[4]
[1,2,3]Hospital Administration Study Program, Politeknik Bhakti Kartini, Indonesia
[4]Multimedia Technology Engineering Study Program, Politeknik Bhakti Kartini, Indonesia

*Corresponding Author: email: ragilsharon@yahoo.co.id
Orcid ID: https://orcid.org/0009-0000-6612-5867

Abstract

Front office staff are the first point of contact between patients and hospitals and primary users of registration modules in the Hospital Management Information System (SIMRS). However, interactions among staff knowledge, skills, attitudes, and organizational and technological factors remain insufficiently understood. This study explored front office staff competency in SIMRS implementation at RS Kartika Husada Jatiasih, Indonesia, and identified barriers and adaptation strategies. A descriptive qualitative case study was conducted in July 2026 involving eight front office staff selected through purposive sampling. Data were collected through in-depth interviews, non-participant observation, and document review. Data analysis involved reduction, display, and conclusion drawing, supported by source and method triangulation. Five themes emerged. Basic knowledge and operational skills were generally adequate and attitudes toward SIMRS were positive, but mastery of advanced features, including BPJS integration and reporting, was concentrated among coordinators and experienced staff, and performance became less stable during system disruptions and peak-hour workloads. These gaps coincided with organizational and technological barriers, notably irregular training, inconsistent dissemination of standard operating procedures (SOPs), limited network infrastructure, and high workloads. Staff compensated through peer learning, manual backup recording, and rapid coordination with information technology (IT) personnel. Staff competency appeared to be shaped by interactions among individual capabilities, organizational support, and technological conditions. Prioritizing regular, tiered training, consistent SOP dissemination, reliable network infrastructure, and structured peer mentoring may strengthen SIMRS implementation and maintain front office service continuity.

Keywords: Adaptation Strategies; Front Office; Hospital Management Information System; Qualitative Study; Staff Competency

Received: Aug 18th, 2026; Revised: Okt24,2026;
Accepted for Publication: Okt28,2026

***©2026* Kurniati Nawangwulan, Vivi Magfiroh, Yuli Restiyanti, Nur Alam**
Licensed under CC BY-SA 4.0

1. INTRODUCTION

Hospitals, as public service institutions, are expected to deliver fast, accurate, and patient-centered services from the first point of contact. The front office unit, which covers registration, information, and front cashier functions, is the frontline that shapes patients' initial impression of overall service quality. Effective communication by registration staff has been reported to be significantly associated with outpatient satisfaction, suggesting that front office performance is relevant to hospital service quality and is more than an administrative function (1).

In parallel, digital transformation in health care has encouraged many hospitals in Indonesia to implement the Hospital Management Information System (Sistem Informasi Manajemen Rumah Sakit, SIMRS), which integrates business processes from patient registration and medical records to medical support services and managerial reporting. SIMRS implementation has been described as a strategy for improving health service delivery, including by facilitating patient registration (2,3).

However, successful implementation depends not only on the sophistication of the technology but also on the readiness and competency of the people who operate it. In a study of Indonesian hospitals, non-technological factors, namely users' human characteristics (such as self-efficacy) and organizational characteristics (such as management support, facilitating conditions, and user involvement), significantly influenced users' perceptions of the ease of use and benefits of hospital information systems (4).

Recent Indonesian studies point to human resource competency, rather than technology alone, as an important factor in SIMRS implementation. A qualitative case study at RSUD Dr. Sam Ratulangi Tondano reported a shortage of qualified information technology personnel, inadequate internet network quality, and poor time discipline among staff, which disrupted service flow (2). A cross-sectional study at a hospital in Langsa linked staff skills, knowledge, and work experience to the utilization of SIMRS (5). In these studies, however, knowledge, skills, training, and organizational support are largely treated as separate factors and examined at the level of hospital human resources in general. How these factors interact in the daily work of one specific service unit is rarely explained, leaving open how competency is formed at the micro level of service delivery.

Front office staff are the main users of the SIMRS registration and patient administration modules, so their competency directly affects the speed and accuracy of the data that enter every downstream service. Barriers to the acceptance of electronic records identified in a systematic review, albeit one focused on

physicians, include technical barriers, for which the suggested interventions include educating users, supporting ongoing training, and promoting the reliability and availability of the system (3). Unpreparedness at the registration level may therefore have downstream consequences: an analysis of patient safety event reports during electronic health record downtime identified patient identification as an area of risk and found that downtime procedures were either absent or not followed in 35 of 76 reports (46%) (6), and patient complaints about registration services have been linked to front office communication (1).

RS Kartika Husada Jatiasih, a private hospital that has implemented SIMRS in its service units, is not exempt from these dynamics. Preliminary observation indicated variation among front office staff in operating the system, in knowledge of system features, in technical skills for completing registration transactions, and in attitudes toward operational problems. The gap addressed here is therefore not merely a shift in the object of study from hospital human resources in general to the front office unit; it concerns the limited understanding of how individual competency (knowledge, skills, and attitudes), organizational support (training and standard operating procedures [SOPs]), and technological conditions (infrastructure stability) interact to shape staff adaptive capacity in maintaining SIMRS-based service continuity in daily practice. These three groups of factors correspond broadly to the human, organization, and technology dimensions of the human–organization–technology fit (HOT-fit) framework (7,8). Studies of the front office unit that adopt such an interaction perspective appear to be limited.

This study therefore aimed to explore front office staff competency, in terms of knowledge, skills, and attitudes, in SIMRS implementation at RS Kartika Husada Jatiasih, and to identify the barriers encountered and the adaptation strategies that staff developed.

2. METHOD

This study used a descriptive qualitative approach with a case study design. A qualitative approach was chosen because the research objective required exploring the meanings, experiences, and perspectives of informants in their natural setting rather than measuring variables. A case study design was appropriate because the phenomenon under study, front office staff competency in SIMRS implementation, is contextual and bound to a specific service setting, which calls for an in-depth understanding of a clearly bounded case (9). The unit of analysis was front office staff as direct users of the SIMRS registration and patient administration modules at RS Kartika Husada Jatiasih, with a focus on the competency, barriers, and adaptation strategies they demonstrated in daily work.

The study was conducted in the front office unit of RS Kartika Husada Jatiasih in July 2026. Informants were selected through purposive sampling based on the following inclusion criteria: (1) currently working as front office staff (registration, information/customer service, or front cashier); (2) having worked and used SIMRS for at least six months; and (3) being willing to participate. Eight informants (P1–P8) met these criteria, representing variation in age, educational level, and length of service. The number of informants was not fixed in advance but followed the principle of information adequacy: recruitment stopped when interviews no longer produced new categories or themes, which was taken to indicate thematic saturation. Methodological work on interview-based studies indicates that, in relatively homogeneous samples, the basic elements of themes can emerge within about six interviews and saturation within about twelve (10,11). The present sample of eight informants therefore lies at the lower end of that range, which is acknowledged as a limitation.

The research instruments were a semi-structured interview guide, an observation guide, an audio recorder, and field notes. The guides were developed from the study objectives and a competency framework covering knowledge of SIMRS functions and features, technical skills in operating the system, and attitudes and motivation toward system use, complemented by domains on obstacles and adaptation strategies. Data were collected in July 2026 using three complementary techniques. First, in-depth face-to-face interviews were conducted in Indonesian with the eight informants (P1–P8) at mutually agreed times. Each interview lasted approximately 45 minutes, allowing for an in-depth exploration of informants' experiences and perspectives. All interviews were audio-recorded with the informants' informed consent. Second, non-participant, non-interventional observations of front office service activities were conducted during routine operating hours across four sessions, each lasting approximately 90 minutes, focusing on how registration transactions were completed, how staff responded to system disruptions, and patterns of coordination among staff. Third, documents were reviewed during July 2026, including standard operating procedures, training records, and patient visit reports. The three data sources were integrated through triangulation so that themes were built on convergent evidence rather than on a single source (12).

Data were analyzed qualitatively in three interrelated stages: data reduction (sorting and focusing the data according to competency themes), data display (organizing the data into a thematic matrix), and conclusion drawing and verification (interpreting patterns that recurred across informants). Informant characteristics,

namely age, educational level, length of service, and work unit, were not treated merely as descriptive data but were used as an interpretive lens for variation in the findings, for example, differences in feature mastery among staff with different tenure and positions. Data trustworthiness was examined through source triangulation, comparing data across informants and with information from the front office supervisor, and through method triangulation, comparing interview results with observation and document review findings (13). Interview excerpts presented in this article were translated from Indonesian into English for publication. Reporting was guided by the Consolidated Criteria for Reporting Qualitative Research (COREQ) (13).

The study involved human participants through interviews and non-interventional observation. Participation was voluntary, informed consent was obtained before data collection, and informant identities were protected using codes P1–P8. No clinical intervention was performed, and the study focused on staff experiences and work processes.

3. RESULTS AND DISCUSSION

Results

This study involved eight front office staff as informants: six women and two men, aged 23–35 years. Their educational backgrounds ranged from senior high school (or equivalent) to a bachelor's degree, and their length of service ranged from 10 months to 6 years. The characteristics of the informants are presented in Table 1.

Table 1. Characteristics of Front Office Staff Informants at RS Kartika Husada Jatiasih

Code	Age (years)	Sex	Highest Education	Length of Service	Work Unit
P1	24	Female	D3 in Medical Records	1 year 8 months	Outpatient Registration
P2	29	Female	D3 in Health Information Management	3 years 2 months	Outpatient Registration
P3	26	Male	Senior high school or equivalent	2 years	Customer Service
P4	31	Female	D3 in Medical Records	4 years 5 months	Front Cashier
P5	23	Female	D3 in Hospital Administration	10 months	Outpatient Registration
P6	35	Female	S1 in Hospital Administration	6 years	Front Office Coordinator
P7	27	Female	D3 in Medical Records	2 years 6 months	Emergency Department Registration
P8	25	Male	Senior high school or equivalent	1 year 3 months	Information and Customer Service

Source: Primary data, 2026.

Theme 1. Knowledge of SIMRS Among Front Office Staff

Informants' understanding of basic SIMRS functions was adequate: all informants could complete core tasks independently, namely registering new patients, retrieving existing patient records, and recording visits, without relying on colleagues. The depth of understanding, however, was uneven. Informants with longer tenure and the coordinator could explain the logic of data flow and the links between modules, whereas newer informants tended to understand operational steps procedurally without knowing how they connected to other modules.

> "I already understand the sequence well enough for registering new patients or finding existing patient records. But for additional menus that are rarely used, I sometimes still have to ask a more senior colleague." (P5, interview)

Understanding of advanced features, such as data integration with the national health insurance system (BPJS Kesehatan) and the preparation of daily visit reports, remained concentrated among informants who were coordinators or had worked for more than three years. This gap did not appear to stand alone; it appeared to be linked to several mutually reinforcing factors: differences in length of service and experience with varied cases, the frequency with which particular features were used in daily tasks, work positions that determined authority to access advanced modules, and the absence of scheduled refresher training. Staff who rarely used advanced features because of the division of tasks tended to have little opportunity to deepen their understanding, so the knowledge gap tended to persist.

Theme 2. Technical Skills in Operating SIMRS

All informants could operate basic data entry and patient search functions independently and smoothly under normal conditions. Speed and flexibility declined, however, in two situations: when the system experienced errors and when staff had to switch quickly between modules during busy visiting hours. Four of the eight informants specifically reported difficulty in these situations, which suggests that skill mastery was not yet fully stable under work pressure.

> "When the system runs smoothly, I can serve patients quickly. What slows me down is when the system suddenly errors out or takes a long time to load, especially at busy hours, when many patients are already queuing in front of me." (P2, interview)

Field observation reinforced this finding. The time needed to complete registration transactions differed across staff, with more experienced informants completing registration in relatively less time than newly assigned informants.

Theme 3. Attitudes and Motivation Toward SIMRS

In general, informants showed positive and open attitudes toward SIMRS because they

considered it faster for administrative processes than the manual system. Some informants, however, voiced concern about dependence on the system, especially during network disruptions.

> "Actually it's better to use the system; the data is tidy and easy to find again. It's just that sometimes I worry if the internet suddenly goes down, because everything is system-based now, so when there's an error we get a bit panicky." (P7, interview)

Informants' motivation to keep improving their competency was reflected in self-directed learning and in asking colleagues who understood the system better, although this was not supported by a structured learning mechanism from management.

Theme 4. Barriers to SIMRS Implementation

Informants described four main barriers: (1) SIMRS training that was not conducted regularly or comprehensively; (2) limited internet network infrastructure that slowed the system during peak hours; (3) SOPs for operating the system that had not been disseminated evenly to all staff; and (4) high workload during busy visiting hours, which increased the risk of data entry errors.

> "When I first started working there was a short training, but after that there has never been a refresher. Yet sometimes there are system updates that we only find out about ourselves when we are already using them." (P6, interview)

Document review confirmed this finding: SIMRS training records for front office staff showed that training was not scheduled routinely within the hospital's human resource development program.

Theme 5. Adaptation Strategies of Front Office Staff

Facing these limitations, front office staff developed several adaptation strategies: helping each other and sharing knowledge among colleagues, preparing manual recording as a backup when the system was disrupted, and promptly contacting the hospital's information technology (IT) team when they encountered technical problems that they could not resolve themselves. The findings for the five themes are summarized in Table 2.

Table 2. Summary of Research Themes

Theme	Subtheme	Empirical Evidence	Data Source	Interpretation
Knowledge	Mastery of basic functions; limited knowledge of advanced features	All informants were independent in registration, record search, and visit recording. Understanding of BPJS integration and reporting was limited to coordinators and senior staff; P5 described asking senior colleagues about rarely used menus.	Interviews P1–P8; observation	Basic knowledge was evenly distributed, but advanced understanding was uneven and linked to length of service and position.

Theme	Subtheme	Empirical Evidence	Data Source	Interpretation
Skills	Basic skills mastered; performance declined during disruptions and peak hours	Data entry and search were smooth under normal conditions. Four informants reported difficulty during errors or module switching at busy hours (P2). Observation showed differences in transaction completion time.	Interviews; direct observation	Skills were not yet stable under pressure; work experience appeared to be associated with speed and flexibility.
Attitudes and Motivation	Positive attitude; concern about dependence on the system	The system was seen as easing administration. Concern arose during network disruptions (P7). Informants showed self-directed learning and asked colleagues for help.	Interviews P1–P8	User acceptance was an asset for adoption but was vulnerable to technological instability.
Barriers	Discontinuous training; unstable network; uneven SOP dissemination; high workload	Training was provided only at the start of employment (P6). The system slowed at peak hours. Document review showed that training was not scheduled routinely.	Interviews; review of SOP and training documents	Barriers originated in organizational and technological factors, not merely individual ones.
Adaptation Strategies	Peer learning; manual recording; coordination with the IT team	Staff shared knowledge, prepared manual recording during system disruptions, and contacted the IT team for technical problems.	Interviews; observation	Forms of resilience that sustained service continuity but depended on individual initiative without systemic support.

Source: Primary data, 2026

Discussion

The data showed that front office staff competency in SIMRS implementation at RS Kartika Husada Jatiasih was adequate for basic knowledge but uneven for more complex system functions. This pattern is partly consistent with a study at RSUD Dr. Sam Ratulangi Tondano, which reported a shortage of qualified information technology personnel in SIMRS-based services (3). The two studies address different problems, however: that study concerned the qualifications of IT personnel, whereas the present finding concerns variation in feature mastery among existing front office staff. The similarity therefore lies in the role of workforce competency rather than in an identical problem.

We interpret the knowledge gap as reflecting a learning process that is left to occur informally and unevenly: system mastery appeared to follow length of service, experience with varied cases, and frequency of feature use rather than an equivalent competency development program for all staff. On this reading, competency is not only a matter of individual ability but also reflects how the organization manages knowledge transfer. Because this is a qualitative case study, this interpretation is

offered as a plausible explanation, not as a causal conclusion.

Technical skills were secure for basic SIMRS functions but became less stable during system disruptions and peak-hour workloads. This is consistent with evidence that SIMRS utilization is associated with users' skills, knowledge, and work experience (4), and it indicates that effective use depends not only on the availability of system features. We interpret the loss of stability under work pressure as pointing to the potential value of simulation or scenario-based training in addition to orientation at the start of employment; this study did not test such training.

Staff attitudes toward SIMRS were generally positive, a favorable condition for sustained implementation, although this study did not assess technology acceptance directly. Informants' concern about network disruptions reflects dependence on technological infrastructure that was not yet fully stable. Inadequate internet network quality was also reported at RSUD Dr. Sam Ratulangi Tondano (2).

System reliability and availability have likewise been addressed among the interventions for technical barriers to the acceptance of electronic records, although the supporting review focused on physicians (14,15). Organizational conditions also appear to shape how users perceive such systems: in the Indonesian hospital study cited earlier, management support, facilitating conditions, and user involvement significantly influenced users' perceptions of ease of use and benefit (9).

The finding that training was not sustained is consistent with evidence that ongoing training and support are among the interventions proposed to overcome technical barriers to electronic record adoption, although the supporting review concerned physicians rather than administrative staff (12,16). We interpret the uneven dissemination of SOPs as a possible source of wider variation in work practice among front office staff, which could lead to inconsistent registration service quality; this study did not measure service quality, so that consequence remains a possibility. At RSUD Dr. Sam Ratulangi Tondano, by contrast, the SOP indicator was rated favorably and was regulated directly by hospital leadership (17), which suggests that in the present case the dissemination of SOPs, rather than their existence, may be the relevant issue. The recommendation to establish a standard procedure for system disruptions is supported only indirectly by an analysis of safety event reports from a United States health system, in which downtime procedures were absent or not followed in 46% of the reports analyzed (8); because that analysis concerned clinical safety events rather than front office performance, the comparison is indicative only.

The adaptation strategies that staff developed, such as peer learning and manual backup recording, point to work resilience among front office staff in the face of system limitations. In the resilience in health care literature, resilience is defined as the capacity to adapt to challenges and changes at different system levels in order to maintain high-quality care (6). Although such strategies may be effective in the short term, we interpret reliance on individual initiative without systemic management support as a risk to service consistency over time, particularly because manual backup practices are only as reliable as the procedures that guide them; the HOPT-fit extension of HOT-fit adds a process dimension for analyzing health information system-related errors (14). Evidence that front office communication is associated with patient satisfaction (1) suggests that the front office role extends beyond technical operation of the system. Communication was not examined in this study, however, so no conclusion about it can be drawn from the present data.

Taken together, the findings suggest an interpretive framework, proposed by the authors rather than tested in this study, in which front office competency in SIMRS implementation is not an isolated individual attribute but emerges from the interaction of three interdependent components: human, organizational, and technological factors. The human factor appears in staff knowledge, skills, and attitudes; the organizational factor in the availability of periodic training, the clarity and dissemination of SOPs, and management support; and the technological factor in the stability of the network infrastructure that supports the system.

These components did not appear to operate separately. In the data, weaknesses in organizational factors (discontinuous training and unevenly disseminated SOPs) and technological factors (network disruptions) coincided with strain on the human factor. At the same time, staff responded through adaptive capacity in the form of peer learning, manual recording, and coordination with the IT team (2). We interpret adaptive capacity as a buffer that maintained service continuity when organizational and technological support was not yet optimal. This interpretation derives from a single case and should be treated as a proposition for further testing rather than an established model. The findings suggest that efforts to strengthen front office competency should address all three components simultaneously rather than focus solely on individual technical training.

This interpretive framework is related to, but distinct from, the HOT-fit framework, which was developed to evaluate health information systems by examining human, organizational, and technological dimensions and the fit among

them, building on the information systems success model and IT–organization fit models (9). The Indonesian hospital study cited earlier, in which human characteristics such as self-efficacy and organizational characteristics such as management support and facilitating conditions significantly influenced users' perceptions of hospital information systems (18), resonates with the three-component structure proposed here. The present study differs in three respects. First, it did not evaluate system success or acceptance against predefined measures but explored competency qualitatively. Second, it focused on a single front office unit rather than on hospital staff in general. Third, it highlights adaptive capacity as a compensatory process that operates when the fit among the three dimensions is incomplete. In HOT-fit terms, the findings may be read as an incomplete fit between users who were competent in basic tasks but unevenly supported and an organizational and technological environment that was not yet fully reliable, a misfit that staff compensated for through the adaptation strategies described above. This reading is interpretive; testing it would require designs that measure the three dimensions and their fit explicitly (9).

Study Limitations

This study was conducted at a single hospital, and its findings reflect the specific organizational and technological context of that setting. The eight informants selected through purposive sampling provided insights into staff experiences within this case; as noted in the Method section, this sample lies at the lower end of the range suggested for thematic saturation, and perspectives from other institutional contexts may differ. Data were collected within a single month (July 2026), so the findings represent a snapshot rather than change over time. As a qualitative study, the findings represent interpretive insights rather than statistically generalizable or causal relationships. Furthermore, the study did not directly measure the relationship between staff competency and service quality indicators. Future research could involve multiple hospitals and incorporate objective service performance measures to further examine this relationship.

4. CONCLUSION

The findings suggest that front office staff competency in SIMRS implementation appears to be shaped by the interaction of individual capabilities, organizational support, and technological conditions. Although basic knowledge, operational skills, and attitudes were generally adequate, challenges persisted in mastering advanced features and maintaining performance under pressure. These challenges coincided with irregular training, limited network infrastructure, and inconsistent dissemination of standard operating procedures (SOPs). Staff adapted through peer learning,

manual backup recording, and coordination with the information technology team, helping maintain service continuity. However, these practices require stronger institutional support. Therefore, hospital management should consider prioritizing regular, tiered training, standardized SOP dissemination, improved network reliability, and structured peer mentoring. Future research should involve multiple hospitals and adopt mixed-methods approaches to examine the relationship between staff competency and measurable service quality indicators.

Acknowledgments

The authors thank the management and all front office staff of RS Kartika Husada Jatiasih for their permission and participation in this study and for the support provided during the research and manuscript preparation.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest

The authors declare no conflict of interest related to the conduct of the research, the interpretation of the results, or the publication of this manuscript.

Ethics Approval

This study involved human participants through interviews and non-interventional observation of front office staff. Participation was voluntary, and all informants provided informed consent. Confidentiality was maintained by removing identifying information and using participant codes (P1–P8).

Author Contributions

Author contributions were determined based on each author's actual roles and responsibilities in conducting the study and preparing the manuscript, in accordance with the Contributor Roles Taxonomy (CRediT). The authors contributed to the study according to their respective areas of responsibility, including conceptualization, methodology, investigation, formal analysis, and writing, including the preparation of the original draft and subsequent review and editing. The author responsible for supervision coordinated and oversaw the conduct of the study. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for their respective contributions to the work.

Artificial Intelligence (AI) Use Disclosure

Claude (Anthropic) was used to assist with language editing and translation. The authors reviewed and verified the revised text and take full responsibility for the manuscript’s content, accuracy, and conclusions.

Data Availability

The qualitative data supporting the findings of this study are not publicly available because they contain information obtained from informants that must be kept confidential.

Further information may be requested from the corresponding author, subject to applicable ethical requirements and the protection of informants' identities.

REFERENCES

1. Chrisdayanti M, … DM-IJ of, 2025 undefined. Hubungan Komunikasi Efektif Pada Staf Front Office Di Bagian Pendaftaran Dengan Kepuasan Pasien Rawat Jalan Di X Hospitals Balikpapan. e-journal.ivet.ac.idM Chrisdayanti, DNS Marchamah, W Arumsari. Indonesian Journal of Health Community, 2025•e-journal.ivet.ac.id. 2025;6(1):130. [accessed 24 Oct 2026] Available from: https://e-journal.ivet.ac.id/index.php/ijheco/article/view/3491
2. Tangel PT, Manampiring AE, Kapantow NH. Penerapan Sistem Informasi Manajemen Rumah Sakit di RSUD Dr. Sam Ratulangi Tondano Implementation of Hospital Management Information Systems at RSUD Dr. Sam Ratulangi Tondano. CliniC. 2024;12(2):121–33. doi: 10.35790/ecl.v12i2.52755
3. Novitri A, Hasibuan R, Harahap JW, Agustina D, Hasibuan SR, Nurmairani A, et al. Analisis Strategi dalam Optimalisasi Pelayanan Kesehatan melalui Implementasi Sistem Informasi Manajemen Rumah Sakit (SIMRS): Systematic Literature Review: Strategy Analysis in Optimizing Health Services through Implementing Hospital Management Informati…. Jurnal Kolaboratif Sains. 2024;7(5):1813–21. [accessed 24 Oct 2026] Available from: https://jurnal.unismuhpalu.ac.id/index.php/JKS/article/view/5333
4. Maliasev D, Mohammed J. Scoping review of user-level barriers to telemedicine adoption in healthcare. Discover Public Health 2025 22:1. 2025;22(1):718-. [accessed 24 Oct 2026] Available from: https://link.springer.com/article/10.1186/s12982-025-01085-5
5. Flaviana B, Karo-Karo U, Sigabariang EE, Studi P, Masyarakat K, Kedokteran F, et al. Pengaruh Mutu Pelayanan Sumber Daya Manusia Terhadap Kepuasan Pasien Di Uptd Puskesmas Semula Jadi Kota Tanjung Balai Tahun 2021. Jambura Journal of Health Sciences and Research. 2023;5(2):632–40. [accessed 24 Oct 2026] Available from: https://ejurnal.ung.ac.id/index.php/jjhsr/article/view/18633
6. Rachmawati E, Umniyatun Y, Imanda R, Listiowati E, Nurmansyah MI. Self-Assessment of Patient Safety Reporting and Learning System in Private Hospitals in Indonesia. SAGE Open Nurs. 2023;9.

[accessed 24 Oct 2026] Available from: https://journals.sagepub.com/doi/full/10.1177/23779608231198406

7. Enstroem R, Singh Kang P, Bhawna B. The harmonized information-technology and organizational performance model (HI-TOP). International Journal of Organizational Analysis. 2025;33(5):1277–92. [accessed 24 Oct 2026] Available from: https://dx.doi.org/10.1108/IJOA-03-2024-4403
8. Yusof MM, Takeda T, Shimai Y, Mihara N, Matsumura Y. Evaluating health information systems-related errors using the human, organization, process, technology-fit (HOPT-fit) framework. Health Informatics J. 2024;30(2). [accessed 24 Oct 2026] Available from: https://journals.sagepub.com/doi/full/10.1177/14604582241252763
9. Katili RA, Nursahadah Irwan TR, Kesehatan Masyarakat J, Olahraga dan Kesehatan F. Kepuasan Petugas Dalam Penggunaan Electronic Health Records (Ehr) Menggunakan Metode Pieces Di Rsia. Sitti Khadijah Gorontalo. Jambura Journal of Health Sciences and Research. 2025;7(3):335–44. [accessed 24 Oct 2026] Available from: https://ejurnal.ung.ac.id/index.php/jjhsr/article/view/33848
10. Guest G, Bunce A, Johnson L. How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. Field methods. 2006;18(1):59–82. [accessed 24 Oct 2026] Available from: /doi/pdf/10.1177/1525822X05279903?download=true
11. Ren C. Qualitative Research. Encyclopedia of Tourism. 2025;841–4. [accessed 24 Oct 2026] Available from: https://link.springer.com/rwe/10.1007/978-3-030-74923-1_426
12. Trinh S, Skoll D, Saxon LA. Health Care 2025: How Consumer-Facing Devices Change Health Management and Delivery. J Med Internet Res. 2025;27(1):e60766. [accessed 24 Oct 2026] Available from: https://www.jmir.org/2025/1/e60766
13. Carter N, Bryant-Lukosius D, Dicenso A, Blythe J, Neville AJ. The use of triangulation in qualitative research. researchgate.netN CarterNumber 5/September 2014, 2014•researchgate.net. 2014;41(5):545–7. [accessed 24 Oct 2026] Available from: https://www.researchgate.net/profile/Harasit Paul/post/Triangulation_of_data_sources_in_qualitative_research_Do_you_consider_it_mixed_methods_research_and_why_whether_its_a_yes_or_no/attachm

ent/5f54865e6a5a0300017ce1f9/AS%3A932660260114433%401599374942659/download/carter2014.pdf

14. Hossain MK, Sutanto J, Handayani PW, Haryanto AA, Bhowmik J, Frings-Hessami V. An exploratory study of electronic medical record implementation and recordkeeping culture: the case of hospitals in Indonesia. BMC Health Services Research 2025 25:1. 2025;25(1):249-. [accessed 24 Oct 2026] Available from: https://link.springer.com/article/10.1186/s12913-025-12399-0
15. Lestari YD, Sitompul R, Widyahening IS, Tahapary DL, Yusuf PA, Sasongko MB, et al. Evaluating diabetes and diabetic retinopathy healthcare services in Jakarta, Indonesia: current challenges and opportunities for improvement. BMC Health Services Research 2026. 2026 Sep 18; [accessed 24 Oct 2026] Available from: https://link.springer.com/article/10.1186/s12913-026-15488-w
16. Patilaiya H La. Analysis of the Ratio of Strategic Health Workers (Specialist Doctors) to Bed Capacity: HR Distribution Mapping and Its Implications for Hospital Talent Management in Indonesia. Journal of Health Service Administration and Hospital Management. 2025;1(2):41–51. [accessed 24 Oct 2026] Available from: https://gpijournal.com/index.php/laceri/article/view/425
17. Silmi FE. Hospital Management Information System Implementation Strategy To Improve The Quality Of Health Services At Pindad General Hospital Bandung. Journal of Applied Digital Business Management. 2026;3(1):15–9. [accessed 24 Oct 2026] Available from: https://ejournal.poltekmi.ac.id/index.php/jadbm/article/view/119
18. Laberta T, Nursa'adah E, Mayub A, Karyadi B, Bramastia. Application of scientific concepts in a flood disaster E-comic to enhance critical thinking skills and foster disaster preparedness among junior high school students. Compton: Jurnal Ilmiah Pendidikan Fisika. 2025;11(2):313–26. doi: 10.30738/cjipf.v11i2.20882