



JNK

JURNAL NERS DAN KEBIDANAN
(JOURNAL OF NERS AND MIDWIFERY)

<http://ojs.phb.ac.id/index.php/jnk>



Exploratory Descriptive Study on the Management og Hospital Facilities and Infrastructure



Muhammad Saleh¹, Prima Dewi², Nurwijayanti², Ning Arti Wulandari³ ,

^{CA}Andi Hayyun Abiddin⁴ 

¹RSUD Sidoarjo Barat, Indonesia

²Universitas STRADA, Indonesia

³STIKes Patria Husada Blitar, Indonesia

⁴Poltekkes Kemenkes Malang, Indonesia

^{CA}Corresponding Author

Article Information

History Article:

Received, 07/09/2024

Accepted, 14/07/2025

Published, 04/08/2025

Keyword:

Healthcare Management, Hospital,
Infrastructure Management

Abstract

Management of facilities and infrastructure has a very important role in the effectiveness of health services, especially in Medical Rehabilitation Installations. Hospitals face challenges related to increasing patient volumes, leading to patient overcrowding and extended waiting times. The aim of this research was to analyze the management of hospital service facilities and infrastructure. The design of this research was exploratory descriptive with a qualitative approach. The subjects of this research were 11 subjects from units related to hospital services at the West Sidoarjo General Hospital. The data collection process was carried out using interviews, observation and documentation. This study showed that improving coordination between management and medical staff as well as improving medical equipment maintenance systems will make a significant contribution to hospitals' ability to meet healthcare needs efficiently. Hospitals need to carry out routine training on the use of medical equipment, form equipment maintenance teams and carry out regular audits.

©2025 Journal of Ners and Midwifery

✉Correspondence Address:

Poltekkes Kemenkes Malang – East Java, Indonesia

Email: andi_hayyun@poltekkes-malang.ac.id

DOI: <https://doi.org/10.26699/jnk.v12i2.ART.p161-169>

 This is an Open Access article under the CC BY-SA license (<https://creativecommons.org/licenses/by-sa/4.0/>)

P-ISSN : 2355-052X

E-ISSN : 2548-3811

INTRODUCTION

Hospitals are institutions that provide comprehensive individual services, including inpatient, outpatient, and emergency services ([Nisa Srimayarti et al., 2021](#)). The existence of hospitals is very useful and helps people who need to get treatment quickly. In addition to providing medical services, hospital management also has non-medical components that affect medical services, namely facilities and infrastructure related to hospitals ([Suratman et al., 2024](#)). The Ministry of Health is trying to improve regulations related to the procurement of medical equipment, which include recommending hospitals or buyers of equipment so that in every procurement or purchase of medical equipment, they include the requirements for the implementation of testing and calibration by the selling company for newly purchased medical equipment before being handed over to the buyer, so that the medical equipment that has been purchased can be used properly, safely, and properly ([Kurniasih, 2023](#)). Things that need to be considered as a company in the health sector are the available facilities and infrastructure, such as complete medical equipment and services provided to patients ([Molenaar et al., 2022](#)). The condition and function of the physical facilities of the equipment must be in good condition ([Dewi et al., 2021](#)). They can support health services with good and integrated coordination between related agencies, starting from planning, procurement, distribution, and maintenance, so that the facilities can function optimally ([Syafrawati et al., 2023](#)). In Indonesia, there are still many hospitals that have shortcomings in terms of management and procurement of hospital facilities and infrastructure ([Mahendradhata et al., 2021](#)). Based on previous study that conducted at the Rokan Hulu Regional Hospital, there were still many facilities and infrastructure that were not well maintained, such as damaged ceilings, broken bathroom locks, and unkempt windows. this was due to the lack of manpower in managing facilities and infrastructure ([Hendrisman et al., 2021](#)). Furthermore, previous study showed that at the Teluk Kuantan Regional General Hospital, management arrangements were

still needed because there were still many workers who did not understand what field they were holding due to the lack of education and training carried out by facility and infrastructure technicians and the lack of funds to maintain facilities and infrastructure ([Candra et al., 2018](#)). Based on the results of a preliminary study conducted by researchers, there was a surge in the number of patients in all services until they reached overcapacity, causing patients to queue to get health services. There are many public complaints against hospitals regarding facilities and infrastructure, both in inpatient and outpatient services. Limited facilities and infrastructure as well as high queues for services in inpatient and outpatient rooms result in discomfort for patients and families.

METHODS

This study used a qualitative approach in the form of a case study of research objects related to the management of facilities and infrastructure for outpatient medical rehabilitation installations at the West Sidoarjo Regional Hospital, which was conducted in March 2025. The subjects in the study were determined by using a purposive sampling technique by the following inclusion criteria: working at West Sidoarjo Regional Hospital for at least 5 years, and willing to be participants. Uncooperative participants were excluded from the study. There were 11 subjects consisting of: 1 (one) Director of the West Sidoarjo Regional Hospital, 1 (one) Head of the Facilities and Infrastructure Section, 1 (one) Head of the Finance Section, 4 (four) Doctors, and 4 (four) Nurses. The data collection process was carried out using interviews, observation, and documentation. The data collected was analyzed inductively and the results of which were presented in narrative form. This research had been declared ethically feasible with the number: 0023470 / EC / KEPK / I / 01/2025 on 13 January 2025 at Universitas Strada Indonesia.

RESULTS

The results of the study of 4 participants related to Hospital Facilities by Outpatients of Medical Rehab at West Sidoarjo Regional Hospital.

The following are the expressions of the participants:

Facility satisfaction by the patients

Patient satisfaction with hospital facilities

“Satisfied” (Participant 1), “very good” (Participant 2), “neutral” (Participant 3), “satisfied” (Participant 4)

The improvements that patients expect

“...increasing the capacity of the waiting area and adding chairs” (Participant 1), “...increasing ventilation and natural lighting in the waiting room” (Participant 2), “...Some areas, such as toilets and waiting rooms, could be given more attention in terms of cleanliness and completeness of facilities such as tissues or soap” (Participant 3), “...increasing seating in the waiting room and arranging queues more neatly” (Participant 4)

Patient issues related to hospital facilities

“No” (Participant 1), “No” (Participant 2), “...accessibility for elderly or disabled patients could be improved, for example with more handrails or special lanes” (Participant 3), “...some parts of the hospital need to be cleaned up during peak hours, especially in the bathrooms and public areas” (Participant 4)

Specific patient feedback

“...Clean and well-functioning equipment needs to be checked regularly” (Participant 1), “...Well-maintained equipment supports patient comfort” (Participant 2), “...Cleanliness is quite good, but there are some tools that need to be checked more regularly to avoid delays in service.” (Participant 3), “...The medical equipment used is quite modern and clean, but education for patients regarding the use of certain tools can be improved” (Participant 4)

Facility Satisfaction by Doctors

Experience problems with medical equipment

“...rarely happens, around 1-2 times per month” (Participant 1), “Quite often” (Participant 2), “...sometimes the dental unit experiences damage such as water not coming out or suction not working” (Participant 3), “...the dental unit is prone to damage when the electricity suddenly goes out or comes back on” (Participant 4)

Support of workspace and facilities for optimal medical services

“Quite optimal, the laboratory is spacious and supports work activities” (Participant 1), “Quite supportive” (Participant 2), “...the dental polyclinic workspace supports optimal services because the equipment is in good condition” (Participant 3), “...the workspace already supports effective treatment, especially for procedures that require good infrastructure” (Participant 4)

Timeliness of resolving medical equipment issues

“Fast response, but sometimes have to wait for spare parts that must be ordered first” (Participant 1), “Quite slow” (Participant 2), “...the infrastructure response is very good and responsive to medical equipment problems” (Participant 3), “...problems are handled quite quickly, but sometimes the technical team does not understand the damage to the dental unit in detail” (Participant 4)

The hospital's readiness to face a surge in the number of patients

“...physical facilities, equipment, and buildings are fully prepared to deal with a surge in patients” (Participant 1), “...not yet ready because the number of employees is still lacking” (Participant 2), “...facilities are adequate, but need to be improved to deal with the very large number of patients” (Participant 3), “...waiting rooms are still lacking and medical instruments need to be added if the number of patients increases” (Participant 4)

Facility Satisfaction by Nurses

Experience problems with medical equipment

“...minimal problems, regular maintenance, quick repairs by the engineering team” (Participant 1), “...problems rarely occur, the technical team is ready to handle repairs quickly” (Participant 2), “...Problems rarely occur, quick repairs thanks to a good maintenance system” (Participant 3), “...Facilities are in good condition, diagnostic and laboratory equipment need maintenance, minimal impact thanks to technical support” (Participant 4)

The wards and facilities sufficient to accommodate the number of patients

“...most of wards are sufficient to accommodate patients, there is an effective bed management system” (Participant 1), “...the wards are adequate, coordination between units is effective when there is a surge in patients” (Participant 2), “...the wards are sufficient, flexibility in bed arrangements ensures unimpeded care” (Participant 3), “...the wards capacity is adequate, there is a mechanism to manage patient flow efficiently” (Participant 4)

The condition of cleanliness and maintenance of the facilities

“...cleanliness is a priority with strict sanitation standards and routine monitoring; suggestions: increase the frequency of sterilization in high-risk areas” (Participant 1), “...cleanliness is very well maintained; improvements can be made with automated sterilizers at strategic points” (Participant 2), “...cleanliness is maintained with strict cleaning schedules and high-quality disinfectants; hygiene education for visitors can be improved” (Participant 3), “...cleanliness is well maintained; adding air sterilizers in infection-prone areas can improve conditions” (Participant 4)

Management support in addressing facility issues

“...management support is very good with clear reporting procedures for facility improvements; issues are addressed quickly without disrupting services” (Participant 1), “...management is open to input from medical staff; infrastructure issue reporting system is very effective” (Participant 2), “...management supports medical staff in ensuring facilities are optimal; reporting procedures are transparent and responsive to issues” (Participant 3), “...management support is very good; reporting of faults is easy through an integrated system, ensuring issues are addressed promptly.” (Participant 4)

Head of Facilities and Infrastructure Section's Feedback

Maintenance and care of hospital facilities according to standards

“...We ensure the maintenance and care of facilities by creating a routine inspection schedule and collaborating with internal technical parties and external vendors. We also use standard operating

procedures (SOPs) as a reference for implementation.”

Obstacles that are often faced in the maintenance process

“...the main obstacles are usually related to budget constraints, delays in procurement of spare parts, and less than optimal cross-unit coordination”

Coordination between the team of the maintenance section

“...coordination is quite effective through an internal reporting system. We also use a fast communication group and online facility for complaints to speed up follow-up.”

Special procedures used to speed up the handling of facility problems

“...we have a fast response service SOP for emergency cases and a priority mechanism based on the level of urgency of damage reports.”

Challenges faced in maintaining the quality of hospital facilities and ways to address them.

“...the biggest challenge is keeping facilities optimal amidst limited resources and intensive use every day.”

“...we conduct regular monitoring, carry out preventive repairs, and collaborate with third parties for technical support.”

Effectiveness of the evaluation of hospital facilities

“...the routine evaluation and audit program runs according to schedule and provides many important inputs for infrastructure improvements.”

Results from the evaluation that have not been followed up

“...there are several inputs that are still in the process of being followed up because they are waiting for budget allocation and development priorities.”

Procurement of medical equipment

“...we always coordinate with the head of the installation and service users to ensure that needs are properly recorded and verified.”

The procurement process is regulated to ensure the quality and sustainability of services

“...the procurement process is carried out through e-purchasing and tenders by applicable provisions while paying attention to quality standards and equipment durability.”

Director of West Sidoarjo Regional Hospital Feedback

The main strategy to improve facility and infrastructure management

“...Our strategy includes strengthening data-based planning, periodic evaluation of facility conditions, and integration of services with digital systems. In the future, West Sidoarjo Regional Hospital will transform into a leading hospital based on digital and integrated services.”

Obstacles that are often faced in implementing the strategy

“...limited budget and human resources are the main challenges. However, we continue to innovate and coordinate with the local government and other stakeholders to overcome them.”

Evaluate the efficiency of the use of current hospital facilities

“...evaluations are carried out periodically through an internal audit system, user satisfaction surveys, and digital monitoring of room utilization.”

Plans to increase capacity or improve existing facilities

“...in 2025 we will build hemodialysis services, expand operating rooms, increase Intensive Care Unit capacity, and enlarge emergency room services to accommodate the surge in patients.”

The decision-making process in prioritizing hospital infrastructure improvements

“...we implement a participatory approach and data-based needs analysis of services. Improvement plans are focused on services that are most needed by patients and have a high impact on safety and quality of service.”

Factors that influence the decisions

“...the main factors include the medical needs of the community, budget availability, HR readiness, and the urgency of services for the quality of hospital services.”

Evaluation frequency of the infrastructure conditions

“...audits are conducted at least twice a year, supplemented by surprise inspections based on user reports or the results of monitoring the hospital information system.”

Evaluation findings from the evaluation that affect hospital operations

“...some findings encourage accelerated improvements, such as improving room ventilation, rejuvenating equipment, and improving the electrical system in the ER and inpatient areas.”

Management plan for the maintenance of medical and non-medical facilities.

“...we prepare short-term and long-term maintenance plans based on actual conditions and minimum service standards, and strengthen the damage reporting system by users.”

Special plans for modernizing hospital equipment

“...we will modernize equipment through e-purchasing, cooperation with medical technology providers, and a gradual equipment renewal program starting in 2025.”

Ways to address the problems of the hospital facility

“...will increase treatment rooms by optimizing existing space, building additional facilities, and implementing a more efficient triage and outpatient system.”

DISCUSSION

Based on the research results, proper planning is needed so that hospital facilities follow what is expected. Based to a previous study, planning is very important because planning is the initial determination of the direction of an activity ([Hartanto et al., 2022](#)). Planning is an action to determine a direction of action, planning provides strategic direction and answers to where, how, what, who, and when ([Bryson et al., 2019](#)). Strategic planning in some circumstances may provide a way of knowing helpful to decision makers ([Ojogiwa, 2021](#)). Planning in hospitals shows the importance of a structured approach to improving the quality of facilities and services. Making a plan is an absolute requirement to implement preventive maintenance. The plan will be the reference for all activities. Proper planning will better ensure the achievement of maintenance goals, on the other hand, an immature plan opens up opportunities for deviations in its implementation ([Desbalo et al., 2024](#)). Facility maintenance management is essential for ensuring long-term values and sustaining project goals

([Dzulkifli et al., 2021](#)). From the patient's perspective, the level of satisfaction varies, with some feeling satisfied and others considering the facilities very good, indicating the need for improvements such as better waiting area capacity and lighting. However, based on the hospital accreditation standards, this is an important component facilities and safety Management standards facilities and environment in the hospital it must be safe, function well, and deliver safe care environment for patients, family, staff and visitors. To achieve That goal is physical facilities, buildings, infrastructure and health equipment and other resources must be managed effectively to reduce and controlling dangers, risks, preventing accidents, injuries and occupational diseases ([Tyas & Agustina, 2024](#)).

Doctors emphasize the need to identify medical equipment problems and plan preventive maintenance to maintain functionality and readiness for a surge in patients. Preventive maintenance is a maintenance activity in the form of maintenance by cleaning equipment carried out every day by operators and adjustment activities, lubrication and replacement of maintenance materials carried out by technicians periodically ([Ramadhani & Heliyanti, 2018](#)). Preventive maintenance aims to minimize the possibility of damage. Maintenance of facilities and infrastructure has several goals and benefits, including optimizing the useful life of equipment, ensuring the operational readiness of equipment to support the smooth running of work so that optimal results are obtained, ensuring the availability of necessary equipment through regular checks and ensuring the safety of people or students who use the equipment ([Dzulkifli et al., 2021](#)).

Meanwhile, nurses reported that although routine maintenance schedules have reduced facility problems, some equipment still requires more attention, especially in high-risk areas. Maintenance of medical equipment is one way to ensure that equipment is always in good condition, can function properly, and has a longer service life ([Corciovă, C., Fuior, R., Andrițoi, D., & Luca, 2022](#)). Apart from that, using equipment according to correct and appropriate procedures by health workers can

reduce the risk of equipment damage ([Handayani, 2020](#)). Overall, careful planning will help hospitals meet patient expectations and improve service efficiency. Analysis of planning in various aspects at the West Sidoarjo Regional Hospital shows that planning is a crucial element in improving the quality of hospital services and facilities. This results in line with the previous study that planning is the initial step that determines the direction of an activity, provides strategies and answers to various important questions ([I Nyoman Tri Sutaguna et al., 2023](#)). In addition, planning hospital facilities and infrastructure, management readiness is needed to organize facilities and infrastructure ([Yazdani et al., 2022](#)). Good coordination and communication between related parties in the medical equipment logistics management process and the creation of standard operational procedure documents at each stage of equipment logistics management, will improve the quality of service ([Shcherbakov & Silkina, 2021](#)).

In terms of organization, it is important to allocate the right resources for the implementation of facility repairs according to priorities. Respondents identified that although most did not experience problems with the hospital infrastructure, a need to improve accessibility for elderly or disabled patients at RSUD Sidoarjo Barat. Therefore, the organization of the maintenance team and equipment procurement must be carried out properly to ensure that all repairs can be carried out efficiently. The hospital must organize a maintenance team that is responsible for handling the repair of medical equipment and infrastructure ([Thapa et al., 2022](#)). The formation of a technical team consisting of electromedical technicians and infrastructure staff is very important to ensure that all equipment is functioning properly. In addition, resource allocation must be carried out efficiently to support the procurement of necessary spare parts and staff training on medical equipment maintenance. Compiling a list of important spare parts that are always available in the hospital is a strategic step to speed up the repair process and prevent operational disruptions.

Implementation of the maintenance plan is a top priority in the actuating aspect (Kumaresan et al., 2024). Preventive maintenance must be carried out routinely to prevent damage to medical devices, while responding to complaints from medical staff must be done quickly through standard operating procedures (SOPs). Staff education is also an important part of implementing this plan. Providing training to staff on how to use medical devices properly and how to report problems that occur will improve work efficiency and service quality. Regular training sessions can help improve staff understanding of the importance of maintaining the condition of medical devices so that they continue to function optimally.

CONCLUSION

There are several aspects of assessment related to the management of hospital facilities, namely strong management support in overcoming obstacles related to infrastructure. In the inpatient, outpatient and surgical units, problems with medical facilities and equipment are resolved directly by nurses. Cleanliness is a top priority with strict sanitation standards, although there are suggestions to increase the frequency of sterilization in high-risk areas and add automatic sterilizers at strategic points.

SUGGESTION

Hospitals should establish a maintenance team consisting of technicians and medical personnel to handle facility issues quickly and efficiently, and ensure smooth communication between teams. Furthermore, conducting regular training sessions for staff on the use of medical equipment and proper cleaning procedures will improve the quality of service and awareness of the importance of facility maintenance. Conducting regular audits of the condition of the facility and the performance of the cleaning team and evaluating responses to patient complaints will help identify areas for improvement so the hospital can ensure that cleanliness and service standards are met.

ACKNOWLEDGMENT

"The authors would like to express their sincere gratitude to all participants who took part in this study. Appreciation is also extended to the Director of West Sidoarjo Regional Hospital for the support and facilitation that enabled the successful completion of this research."

FUNDING

This research was funded by the researcher independently

CONFLICTS OF INTEREST

Authors declare that they have no conflict of interest in this study.

AUTHOR CONTRIBUTION

The first author carried out data collection at West Sidoarjo General Hospital, the second and third authors carried out narrative analysis, the fourth author carried out discussions, while the last author as a correspondent wrote the research results in the form of articles

REFERENCES

- Bryson, J. M., Crosby, B. C., Bryson, J. K., Bryson, J. M., Crosby, B. C., & Understanding, J. K. B. (2019). *Understanding Strategic Planning and the Formulation and Implementation of Strategic Plans as a Way of Knowing: The Contributions of Actor-Network Theory PLANS AS A WAY OF KNOWING: THE CONTRIBUTIONS OF ACTOR-NETWORK THEORY*. 7494(May). <https://doi.org/10.1080/10967490902873473>
- Candra, L., Widodo, M. D., & Tonis, M. (2018). Analisis Sistem Manajemen dalam Pemeliharaan Sarana dan Prasarana di Rumah Sakit Umum Daerah Teluk Kuantan Tahun 2016. *KESMARS: Jurnal Kesehatan Masyarakat, Manajemen Dan Administrasi Rumah Sakit*, 1(1), 49–53. <https://doi.org/10.31539/kesmars.v1i1.150>
- Corciovă, C., Fuior, R., Andrițoi, D., & Luca, C. (2022). Assessment of medical equipment maintenance management. *In Operations*

- Management and Management Science*.
<https://doi.org/10.5772/intechopen.1000210>
- Desbalo, M. T., Woldesenbet, A. K., & Yehualaw, M. D. (2024). Critical factors that influence the effectiveness of facility maintenance management practice in public university buildings in Ethiopia : an exploratory factor analysis. *Cogent Engineering*, 11(1).
<https://doi.org/10.1080/23311916.2024.2307150>
- Dewi, C., Windoro, D., & Pura, D. N. (2021). Management of Physical Education Facilities and Infrastructure. *Journal of Education Technology*, 5(2).
<https://doi.org/10.23887/jet.v5i2.34450>
- Dzulkifli, N., Sarbini, N. N., Ibrahim, I. S., Abidin, N. I., Yahaya, F. M., & Nik Azizan, N. Z. (2021). Review on maintenance issues toward building maintenance management best practices. *Journal of Building Engineering*, 44, 102985.
<https://doi.org/10.1016/j.jobbe.2021.102985>
- Handayani, I. N. (2020). Pemeliharaan Preventif Alat Elektromedik di Puskesmas Kecamatan Kebayoran Lama. *International Journal of Community Service Learning*, 4(1), 83–89.
<https://doi.org/10.23887/ijcs.v4i1.24437>
- Hartanto, Y., Firmansyah, M. A., & Adhrianti, L. (2022). *Implementation Digital Marketing Pesona 88 Curup in to Build Image for the Decision of Visit Tourist Attraction*. 658(SoRes 2021), 589–594.
<https://doi.org/10.2991/assehr.k.220407.121>
- Hendrisman, Sutomo, S., Arnawilis, Hartono, B., & Lita. (2021). Analisis Manajemen Pemeliharaan Sarana dan Prasarana di Rumah Sakit Umum Daerah Rokan Hulu. *Jurnal Kesehatan Komunitas*, 7(April), 45–56.
<https://doi.org/10.25311/keskom.Vol7.Iss1.638>
- I Nyoman Tri Sutaguna, Gusti Noorlitaria Achmad, Andriya Risdwiyanto, & Muhammad Yusuf. (2023). Marketing Strategy for Increasing Sales of Cooking Oil Shoes in Barokah Trading Business. *International Journal of Economics and Management Research*, 2(1), 132–152.
<https://doi.org/10.55606/ijemr.v2i1.73>
- Kumaresan, V., Saravanasankar, S., & Bona, G. Di. (2024). Identification of optimal maintenance parameters for best maintenance and service management system in the SMEs. 30(1), 133–152. <https://doi.org/10.1108/JQME-10-2022-0070>
- Kurniasih. (2023). Analisis Unsur Manajemen Pemeliharaan Sarana Dan Prasarana di Rumah Sakit Pekanbaru Medical Center (PMC) Kota Pekanbaru. *Journal of Hospital Management and Health Sciences*, 4(2), 10–19. <https://doi.org/10.55583/jhmhs.v4i2.669>
- Mahendradhata, Y., Andayani, N. L. P. E., Hasri, E. T., Arifi, M. D., Siahaan, R. G. M., Solikha, D. A., & Ali, P. B. (2021). The Capacity of the Indonesian Healthcare System to Respond to COVID-19. *Frontiers in Public Health*, 9. <https://doi.org/10.3389/fpubh.2021.649819>
- Molenaar, E. R., Karamoy, H., Wagey, F., & Surya, W. S. (2022). Studi Korelasional antara Minat Pasien dan Sarana Prasarana Terkait Kepuasan Pasien Rawat Inap di Rumah Sakit TNI AU Sam Ratulangi Manado. *E-CliniC*, 11(1), 117–123.
<https://doi.org/10.35790/ec.v11i1.44324>
- Nisa Srimayarti, B., Leonard, D., & Zhuhriano Yasli, D. (2021). Determinants of Health Service Efficiency in Hospi-tal: A Systematic Review. *International Journal of Engineering, Science and Information Technology*, 1(3), 87–91.
<https://doi.org/10.52088/ijesty.v1i3.115>
- Ojogiwa, O. T. (2021). THE CRUX OF STRATEGIC LEADERSHIP FOR A TRANSFORMED PUBLIC SECTOR MANAGEMENT IN NIGERIA. *Journal, International Business, O F Studies, Management*, 8047, 83–96.
<https://doi.org/10.48080/ijbms.20210105>
- Ramadhani, N., & Heliyanti, Y. (2018). Sistem Informasi Manajemen Peralatan Medis Di

- Rsud Dr H Slamet Martodirdjo Pamekasan. *November*, 10(2), 59–65.
- Shcherbakov, V., & Silkina, G. (2021). Supply Chain Management Open Innovation: Virtual Integration in the Network Logistics System. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1). <https://doi.org/10.3390/joitmc7010054>
- Suratman, F., Novian, D., & Purwadhi, P. (2024). *NON-BPJS CLINIC MANAGEMENT: STRATEGIES , CHALLENGES AND*. 1(1), 206–230.
- Syafrawati, S., Lipoeto, N. I., Masrul, M., Novianti, N., Gusnedi, G., Susilowati, A., Nurdin, A., Purnakarya, I., Andrafikar, A., & Umar, H. B. (2023). Factors driving and inhibiting stunting reduction acceleration programs at district level: A qualitative study in West
- Yazdani, M., Mojtahedi, M., Loosemore, M., & Sanderson, D. (2022). A modelling framework to design an evacuation support system for healthcare infrastructures in response to major flood events. *Progress in Disaster Science*, 13, 100218. <https://doi.org/10.1016/j.pdisas.2022.100218>
- Sumatra. *PLOS ONE*, 18(3), e0283739. <https://doi.org/10.1371/journal.pone.0283739>
- Thapa, R., Yih, A., Chauhan, A., Poudel, S., Singh, S., Shrestha, S., & Tamang, S. (2022). Effect of deploying biomedical equipment technician on the functionality of medical equipment in the government hospitals of rural Nepal. *Human Resources for Health*, 4–11. <https://doi.org/10.1186/s12960-022-00719-y>
- Tyas, A. K., & Agustina, P. (2024). Analisa Pemenuhan Sarana dan Prasarana Di Instalasi Rehabilitasi Medik. *Indonesian Journal of Hospital Administration*, 7(2), 52–61. <https://ejournal.almaata.ac.id/index.php/IJHAA/article/view/4691/2635>. <https://doi.org/10.18261/drama.61.1.10>