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Analysis of Management Functions in an Efforts to Improve the Efficiency and Effectiveness of Management of Medicines and Expiry Medical Materials

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Abstract

This study aims to analyze the application of management functions in the management of drugs and medical consumables (BMHP) to enhance efficiency and effectiveness at the Regional General Hospital (RSUD) of Nunukan Regency. The research focuses on the four key management functions: planning, organizing, actuating (implementation), and controlling (supervision), while also identifying the challenges and implications of BMHP logistics management for healthcare service quality. Using a qualitative research approach, data were collected through in-depth interviews, direct observation, and document analysis. Informants included hospital leaders, pharmacy installation heads, pharmacists, logistics staff, and patients. The results show that the planning function is carried out based on consumption methods and VEN (Vital, Essential, Non-Essential) and ABC analysis, but still lacks support from an integrated information system. The organizational structure exists, but its implementation is not yet optimal. The implementation function follows SOPs, although constrained by billing system issues and geographical challenges. Supervision is conducted both internally and externally, but regular monitoring is still limited. Key obstacles include budget constraints, payment delays, and logistics challenges due to the hospital's remote border location. Efficient and effective management has a direct impact on the quality of patient services, particularly in drug availability, service timeliness, and patient satisfaction. This research recommends improving logistics information systems, strengthening interdepartmental coordination, adjusting budgeting strategies, and increasing accountability to ensure high-quality pharmaceutical governance in regional public hospitals.

Introduction

Nunukan Regency, a region resulting from the division of Bulungan Regency, has an area of 14,247.50 km2 and a population of 227,460 (2024), located in North Kalimantan Province. Its unique geographical conditions present unique challenges, with expanses of ocean, mountains, rivers, and a geographical border with neighboring Malaysia contributing to its unique governance. Nunukan Regency boasts the only Type C Regional General Hospital, owned by the Nunukan Regency Government. Originally a Community Health Center (Puskesmas) built in 1970, the hospital was expanded into a Type D hospital in 2003. In 2008, it moved into a new building on Jl. Sei. Fatimah TR. 04, Binusan Village, West Nunukan District, Nunukan Regency. Nunukan Regency Hospital, with a land area of 7.5 hectares and registration number 6408025, has evolved into a Type C Regional General Hospital and is currently a Type C Regional General Hospital.

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Nunukan Regency Hospital has evolved into a Regional General Hospital that implements the financial management model of the Regional Public Service Agency, based on Decree of the Regent of Nunukan Number 884 of 2010, dated October 21, 2010. In accordance with the plan to upgrade and develop Nunukan Regency Hospital from a Class C Hospital to a Class B Hospital, Nunukan Regency Hospital has implemented various improvement efforts. Construction in various areas includes the Cathlab Building, the planned renovation of the CT Scan Building, and plans to improve other superior service; es (Fagal, 2024; Kalay & Schaumann, 2021; Garg, 2023; Buldo, 2024; Sachdeva et al., 2024). In the health sector, the Nunukan Regency Government continuously strives to improve both infrastructure and services to the wider community. To support efforts to achieve a healthy regency community, various health facilities are available, including the Nunukan Regency General Hospital, owned by the Nunukan Regency Government (Sulaksonon, 2025; Dananjaya, 2023; Maniagasi et al., 2021; Palutturi et al., 2022; Hidayat et al., 2024).

The Nunukan Regency General Hospital has human resources including specialist doctors, general practitioners, dentists, midwives, nurses, pharmacists, and other paramedical personnel whose staff is continuously being improved, both in terms of quantity and quality (Sachdeva et al., 2024; Usamah et al., 2024; Cahyani et al., 2024). The Nunukan Regency General Hospital is a Regional Government Work Unit (SKPD) within the Nunukan Regency government, taking the form of a Regional Public Service Agency (BLUD). A BLUD is a government agency established to provide services to the public in the form of goods and/or services without prioritizing profit, and its implementation is based on the principles of economy, efficiency, and effectiveness. Proper management of drugs and Expendable Medical Materials (BMHP) can prevent hospital drug shortages (out-of-stock) or excess stockpiling (overstock), and reduce the number of expired drugs. Therefore, efficient supply chain management in the procurement of drugs and expendable medical materials is a key factor in optimizing medical supply costs (Paul et al., 2024; Almaktoom & Yusuf, 2025; Oluwole et al., 2024; Abu et al., 2021; Tabish, 2024).

Based on secondary data obtained from the Nunukan District General Hospital during the period of January-December 2024, 22 out of 445 types of drugs were out of stock. Health services are the right of every person guaranteed by the 1945 Constitution of the Republic of Indonesia, which must be realized through efforts to improve the highest level of public health. Hospitals are health service institutions for the community with their own characteristics influenced by developments in health science, technological advances, and the socio-economic life of the community. They must continue to be able to improve services that are of higher quality and affordable to the community in order to realize the highest level of health (McCauley et al., 2021; Monica, 2025; Schleiff et al., 2021; Mourtzis et al., 2022).

Hospital pharmacy services are one of the activities in hospitals that support quality health services. In the Regulation of the Minister of Health Number 58 of 2014 concerning Pharmaceutical Service Standards, it states that hospital pharmacy services are a direct and responsible service to patients related to drugs with the aim of achieving definite results to improve the quality of life of patients (Samuel et al., 2022; Costa et al., 2021). Hospital pharmacy installation is one of the units in the hospital that is tasked and fully responsible for the management of all aspects related to drugs and Medical Expendable Materials (BMHP) that are distributed and used in the hospital. Management of drugs and Medical Expendable Materials (BMHP) is one aspect of hospital management that is very important in providing overall health services, because inefficiency and uneven drug management will have a negative impact on the hospital, both medically, socially and economically (Siregar, 2004). According to Suciati & Adisasmito (2006), pharmaceutical services are supporting services and also a

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major revenue center. This is considering that more than 90% of healthcare services in hospitals use pharmaceutical supplies (medicines, chemicals, radiological materials, consumable medical devices, medical equipment, and medical gases), and 50% of all hospital income comes from the management of pharmaceutical supplies. The most important aspect of pharmaceutical services is optimizing the use of drugs and Medical Expendable Materials (BMHP), this includes planning to ensure the availability, safety, and effectiveness of drug use. Therefore, if pharmaceutical supplies are not managed carefully and responsibly, it is predictable that hospital income will decrease. Pharmaceutical services are activities that identify, aim to prevent, and resolve drug-related problems. Patient and public demands for improved pharmaceutical service quality require an expansion from the old drug-oriented paradigm to a new patient-oriented paradigm with a pharmaceutical service philosophy (pharmaceutical care). One of the factors that significantly influences drug supply in hospitals is controlling the amount of drug stock to meet needs. If drug stocks are too low, demand for use is often not met, resulting in patient/consumer dissatisfaction (Blum & Kreitman, 2022; Ahen et al., 2023; Scambler, 2023; Beard et al., 2025).

Since the implementation of the National Health Insurance (JKN) by the Social Security Administering Agency (BPJS) on January 1, 2014, there has been an increase in the number of inpatients, outpatients, and emergency patients visiting hospitals. Based on data from the Nunukan Regency Regional General Hospital, the Bed Occupancy Percentage in 2023 was 65.1% with an average of 37 inpatient visits per day and in 2024 it became 65.2% with an average of 40 inpatient visits per day. This has resulted in an increase in drug demand. Initially, the drug supply in the pharmacy installation was not able to meet the needs of every patient who came to Nunukan Regional General Hospital, both JKN participants and general patients (non-JKN), so that many JKN participants still purchased their own drugs at other pharmacies and requested a refund from the hospital's finance department by bringing a drug payment receipt (reimbursement system). However, over time the drug procurement stage in the pharmacy installation was able to meet drug needs so that the reimbursement system was reduced, only for certain drug items, drug purchases outside still existed.

With the less-than-optimal duties and functions of the Pharmacy and Therapeutics Committee formed since the hospital's accreditation, drug selection, planning, and procurement have not been running effectively because there is no official hospital formulary used as a therapy guide, only referring to the national formulary. This also results in many drugs prescribed by doctors, especially branded drugs (patented), not being available in the pharmacy installation. Hospital governance is one concept that can be applied in order to improve hospital performance (Rusydi et al., 2020); (Mahmudi et al., 2023). Hospital governance is defined as a set of processes and tools related to decision-making in order to direct institutional activities, influence organizational behavior, and recognize the complex relationships between various stakeholders (Saltman et al., 2011).

Based on Law No. 44 of 2009, good hospital governance is the implementation of hospital management functions based on the principles of Transparency, Accountability, Responsibility, Independence, and Fairness. The implementation of hospital governance must be supported by the commitment of all parties' boards, management, doctors, nurses, staff, and local governments to create an effective, efficient, and accountable hospital (Tjaija et al., 2021). In this regard, the Health Office is responsible for providing various services tailored to the specific needs of the communities they serve (Hanlon et al., 2017). Evaluation in medication management is used to identify weaknesses and difficulties in each stage of the medication and Expendable Medical Materials (BMHP) management process. These include planning, procurement, storage, distribution, supervision, and evaluation at the Regional General

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Hospital (RSUD), as evaluation can increase effectiveness (Imran et al., 2021). Furthermore, Suryanto et al. (2020) stated that when effectiveness and efficiency are present, good management can be achieved (Suryanto, 2020). This includes good medication management. Therefore, planning for Medications and Expendable Medical Materials (BMHP) requires a clear understanding of the process and evaluation of medication and Expendable Medical Materials (BMHP) management at the Nunukan Regional General Hospital. Ineffective medication availability management is also often caused by a lack of coordination between units and inaccurate demand data (Cahyani et al., 2020). Research by Yanti et al., 2024, found that the use of information technology in stock management can reduce errors in predicting medication needs.

Method

This research uses a descriptive method, where the research procedure provides written descriptions or raw data as data sources. This allows the individual approach to provide a representative assessment of the population as a whole. The researcher will also process and analyze the results to provide a detailed overview of the management functions involved in the effective and efficient management of drugs and consumable medical materials (BMHP) at the Nunukan Regency General Hospital. This descriptive approach will be more specific for this research. The researcher will also conduct in-depth fieldwork, with the aim of objectively assessing the research object, including the situation, conditions, events, activities, and thoughts, so that the research report will reflect the actual situation. This research is a qualitative study, aiming to provide an overview of the management process of drugs and consumable medical materials (BMHP) at the Nunukan Regency General Hospital. Proper management of Drugs and Consumables (BMHP) can prevent hospital drug shortages (out-of-stock) or overstocking, and reduce the number of expired drugs.

Management Of the Role of The Researcher

The researcher's vital role in this research determines the depth of the raw data obtained. This is reflected in the flexible research process, which allows for adjustments to the research process according to the realities of the field. This ensures that researchers obtain objective results that can be used by policymakers to make informed decisions related to improving healthcare services in Nunukan Regency.

Research Location

This research is located within the jurisdiction of the Nunukan Regency Regional Government, namely the Nunukan Regency General Hospital, North Kalimantan Province.

Data Sources

This research will utilize primary and secondary data from existing sources, ensuring a more focused and unbiased research outcome. Based on the researcher's preliminary observations, it can be concluded that drug and disposable medical supplies (BMHP) are frequently out of stock. Therefore, the data obtained, which falls into the primary category, is data in verbal form, or words spoken orally, gestures, or behaviors performed by trustworthy subjects, in this case the research subjects (informants), regarding the variables being studied (Arikunto, 2010). Techniques used include interviews, observations, surveys, and other media to obtain data in the field. The researcher requires data on the planning and implementation of drug and disposable medical supplies (BMHP). Management functions in the effective and efficient management of drugs and disposable medical supplies (BMHP) are crucial in the healthcare process in hospitals. Secondary data is the result of data collection used to support the research

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findings. The data for this research can be said to have been obtained from observations of data collected from literature studies, laws and regulations, and other data. Secondary data is data obtained from graphic documents (tables, notes, meeting minutes, Whatsapp chats, photos, films, video recordings, objects and others) so that the secondary data and primary data support and complement each other. Other documents that can also be used as data such as completeness of files used as a form of proof of the Regional Government's efforts in improving Health Services, both in terms of planning, infrastructure to the form of socialization that can be used as literature as secondary data in supporting this research.

Data Collection Techniques

To gather information, the researcher employed a question-and-answer method. Interviews with informants are one method used to obtain information. One of the informants interviewed was the Director of the Nunukan Regency Regional General Hospital, a regional agency responsible for the management of drugs and disposable medical materials (BMHP) at the Nunukan Regency Regional General Hospital. The interviews were conducted systematically using a pre-prepared interview guide, with the aim of providing objective and in-depth interview results that could serve as supporting data for this research. The interview results, in the form of notes and audio-visual recordings, will be modified into written interview transcripts, which will then be formulated as supporting evidence for the analysis and discussion in this study. By using field observations, the researcher can experience conditions in the field. This is done to maximize the results obtained, allowing for structured decisions based on priority interests. Through field observations, researchers were also able to see and experience the conditions at the Nunukan Regency General Hospital. During the research, data collected included research notes, transcripts of regulations and legislation, photographs, and documentation at the Nunukan Regency General Hospital, which will influence the results of this study. During the research, data collection was also obtained through written recording transcripts, review notes from several informants, field notes, photographs, and documentation at the Nunukan Regency General Hospital to assess the objectivity and accuracy of oral information on certain matters, as a form of in-depth analysis of the research findings.

Data Analysis Techniques

In conducting this research, the data collected consisted of official data on the ordering process and flow, procurement, and distribution of drugs and Expendable Medical Materials (BMHP), as well as other supporting data related to the Management of Drugs and Expendable Medical Materials (BMHP) at the Nunukan Regency General Hospital. Because this is mandatory, the data obtained is derived from related regulations and laws. Data obtained during the research, such as transcripts of official documentation, written records, review notes, and official documents, were collected and compiled by the researcher to enhance their understanding. They were then compiled into a systematic research summary. This was then reviewed and analyzed using the Miles and Huberman method. This qualitative data analysis technique involves three steps: data reduction, data presentation, verification, and conclusion drawing. This is expected to produce narrative findings that serve as new data and serve as a basis for further in-depth research.

The results of the research, which serve as a starting point, will then be continued with data reduction, neatly arranged sequentially based on the type, source, informant, time, and location of the research. These results will then be abstracted and summarized as an interpretation regarding the fulfillment of citizens' health rights in the border area of Nunukan Regency objectively. The results of the assessment will then be compared with the Drug Planning and BMHP in the Program Preparation, Finance, and Reporting Section of the Nunukan Regency

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Regional General Hospital to resolve the problem. The results of this comparison will then serve as a reference and focus in the research to answer the formulation of this research problem.

Validation Checking of Findings and Conclusions

As a measuring tool in this research, the validation of findings will be referred to as a research variable. As a variable, it will naturally serve as a measuring tool in research on natural and social phenomena that will be observed in determining the research instrument. A research variable is an attribute, characteristic, or value of a person, object, or activity that has certain variations determined by the researcher to be studied and then conclusions drawn (Sugiyono, 2019). The formulation of this instrument will be used as a research tool that can function to facilitate and assist in in-depth analysis of research results more easily and objectively, including: The researcher used the observation method, namely by collecting data as used in qualitative research methods. Observation techniques maximize activities using the five senses, so that the results of observations in research include activities, events, occurrences, atmospheres, and a person's feelings and emotions, as a technique for in-depth analysis to obtain research results.

This observation is used as a description of an event or problem to answer the research questions. To obtain objective results, data collection through interviews will be used as a research method. This serves as a comparison to examine the urgency of the problem, at least as a comparison to the researcher's personal beliefs. This method is used to obtain more in-depth research results. The outline of the semi-structured interviews will be reused as the basis for conducting the interviews, but the questions used in these interviews are intended only to supplement data on the problem being studied. The informants in this study are Managerial Officials and Technical Officials directly involved in the technical aspects of the process, from the Request for Goods process, Management Approval, Purchasing of Goods to the Distribution and Use of Drugs and Medical Consumables (BMHP). This is crucial because the Management Process of Drugs and Medical Consumables (BMHP) require a specific process that cannot be carried out without structured coordination.

Result and Discussion

Analysis of Management Functions in Efforts to Increase the Efficiency and Effectiveness of Drug and Medical Expendable Materials Management (BMHP) at Nunukan Regional General Hospital

Management functions in the health sector are a crucial and even strategic element in efforts to improve health services. With optimal health, individuals, communities in a region, or even a country, will have greater opportunities and abilities to meet their educational and economic needs, which in turn will impact the quality of human resources as agents of development. According to the WHO (1947), health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. (Ministry of Health of the Republic of Indonesia, 2016). One essential component of health services is medication. Furthermore, because medication has become a public necessity, the public perceives that the outcome of health services, namely receiving medication after visiting health facilities, such as community health centers, polyclinics, hospitals, private practice doctors, and others, is essential.

Medical personnel are likened to soldiers fighting on the battlefield; therefore, the absolute ammunition to defeat the enemy is medication. Correct, efficient, and effective management of drugs and disposable medical materials (BMHP) is essential for healthcare workers at the central, provincial, and district/city levels, given the vital role of drugs in healthcare services.

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The following are excerpts from interviews with informants in this study: Within the framework of management functions, planning is the initial stage that significantly determines the overall quality of hospital logistics management, particularly in the procurement and distribution of drugs and disposable medical materials (BMHP). Based on interviews with various key informants, it can be concluded that Nunukan Regency Hospital has implemented systematic drug and BMHP management planning, although there is still room for improvement.

> *"We formed a drug planning team and a BMHP (National Drug Monitoring and Monitoring Agency). With this team, I believe we can be more structured in procuring medicines and providing them effectively. Those involved in the planning process include the Head of the Pharmacy Warehouse, the Procurement Department, and the Head of the Pharmacy Installation within the Pharmacy. Historical usage data is essential because it relates to needs, and we must prepare for the possibility of additional patients, so there is a 10 to 20 percent supply of Sper compared to previous usage."*

As stated by the Acting Director of Nunukan Regional Hospital, Dr. A. Bau Tune Mangkau, Sp.B, the formation of a planning team consisting of the Head of the Pharmacy Warehouse, the Procurement Department, and the Head of the Pharmacy Installation is a positive step towards a collaborative approach. This strategy demonstrates the recognition that pharmaceutical management cannot be carried out sectorally but must involve various parties across units. Furthermore, planning is carried out by considering previous usage data and adding a 10–20% buffer stock, reflecting the practice of planning based on service load prediction.

The explanation from the Head of Administration, H.M. Shaleh, SE., M.A.P., reinforced the importance of the administrative stages in the planning process. The Drug Requirements Plan (RKO) document not only serves as the basis for procurement but also serves as part of an integrated accountability mechanism within the hospital budget system, including the Budget Business Plan (RBA), the Work and Budget Plan (RKA), and input into the Hospital Budget Information System (SIPD). This procedure demonstrates that planning is not merely a technical activity but also part of the public financial governance process, which demands accuracy, transparency, and regulatory compliance.

> *"This planning process is carried out by the Pharmacy Unit, which creates the RKO. It maps the inventory of the most rapidly used drugs and those in short supply. From there, they can identify which drugs are in short supply and which are in excess. They also calculate the annual stock and input it into the RKO."*

Information obtained from the Head of Medical Support, Desy Syahdiana, S.Farm., Apt., and the Head of the Pharmacy Installation, Apt. Yulita Hesrina, S.Farm., indicates that in practice, planning is prepared using a combination of several analytical approaches: the consumption method, the VEN (Vital, Essential, Non-Essential) method, and the ABC (value-based) method. All three are used in a complementary manner to generate procurement decisions that consider not only the volume of use but also the level of medical urgency and cost efficiency. This triangulation approach demonstrates a deep understanding of the complexities of hospital pharmacy management, while simultaneously striving to optimize the use of limited budgets.

> *"We are responsible for the preparation of medicines and BMHPs. If any are low or empty during preparation, we inform the procurement department, specifically the Head of the Pharmacy Installation. He will then procure both medicines and BMHPs. We are only in the field, checking whether the medicines and BMHPs are still available*

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or running low. We then inform the Head of the Installation, who is also the Procurement Officer."

Operationally, the Head of the Pharmacy Warehouse, Apt. Prisila R. Niaty, S.Farm, acts as a liaison between actual stock levels in the field and procurement officers. This communication model is crucial to ensure that information from the frontline distribution points can be responded to promptly during the planning and ordering cycle. This demonstrates the existence of an informal yet vital internal monitoring function. An interesting point was also highlighted by the next informant, Apt. Novrianty, S.Farm. The following is an interview with her:

"In the BMHP planning process, I use the consumption method, so I base it on the year's needs, and then... Divide by twelve and add ten percent for the Buffer Stock."

This approach aligns with the consumption method commonly used in healthcare facilities. However, using a single method like this can be less adaptable to the dynamics of fluctuating disease patterns or the emergence of unexpected emergency needs. Planning should be based on intensive communication between the pharmacy team and medical personnel, particularly specialist physicians. The formulary developed at the beginning of the year should reflect actual needs in the field. Furthermore, evaluations are conducted using the last three months as a predictive basis for the following period. This demonstrates the importance of clinician involvement in the planning process, not only to ensure a match between availability and need, but also as part of the professional accountability process. In general, the planning function at Nunukan Regional Hospital has demonstrated systematic efforts to manage pharmaceutical logistics needs efficiently and effectively.

However, strengthening information system integration, consistency in data updates, and periodic evaluation of the accuracy of demand predictions are still needed. Furthermore, the development of a reporting and feedback system from service units to the pharmacy division also needs to be improved to ensure an adaptive planning cycle based on the reality of service delivery in the field. Interviews indicate that planning for the management of drugs and Expendable Medical Materials (BMHP) at Nunukan Regency Hospital has been implemented through a fairly systematic mechanism. The planning team consists of the Head of the Pharmacy Installation, the Head of the Pharmacy Warehouse, the procurement department, and relevant supporting units. This team develops a Drug Requirements Plan (RKO) using historical data on drug usage from the previous year, then adds a 10–20% buffer stock to anticipate increased patient numbers. Methods used in the planning process include the consumption method, VEN (Vital, Essential, Non-Essential) analysis, and ABC or Pareto analysis to prioritize the types of drugs to be procured based on medical urgency and economic value. This is reinforced by statements from most informants who stated that vital drugs, such as emergency and chronic disease medications, are prioritized for procurement, even though quantities are limited. However, challenges remain in the planning process. Several informants revealed that budget constraints prevent all required drugs from being fully procured. Furthermore, the validity of usage data from service units remains an issue, where data discrepancies can compromise planning accuracy. Several informants emphasized the need for improved integrated information systems to support the quality of future planning.

Organizing Function

The organizing function in management plays a crucial role in determining the effectiveness of policy implementation and operational efficiency within the hospital environment. Organizational development involves more than just establishing a formal structure; it also ensures that the division of roles, responsibilities, and coordination between units aligns with

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procedures and service needs. In the context of the Nunukan Regency Regional General Hospital, field findings indicate that the organization of medication management and BMHP (National Health and Safety Management System) has been established structurally, but differences in perception and implementation remain between work units. Acting Director of the Regional General Hospital, Dr. Andi Bau Tune Mangkau, SP.B., outlined the role of management organization as follows:

> *"From a management organizational perspective, we must analyze our management organization. Needs must be measurable, not exceeding our purchasing capacity, and the division of tasks must be appropriate. So, the warehouse prepares drugs, and the service unit distributes them from the warehouse, so there's a flow that must be followed."*

This demonstrates that procedurally, there's a structured work plan to ensure the availability and distribution of pharmaceutical logistics. However, the recognition that needs must be aligned with the hospital's financial capabilities also demonstrates that the organizational function is not merely administrative, but also closely related to realistic strategic planning.

Furthermore, H.M. Shaleh, SE., M.A.P., Head of Administration, emphasized the organizational structure outlined in the SOTK (Organizational Structure and Work Procedures). The following is an excerpt from the interview:

> *"The function of this organizational structure is certainly very supportive because without it, the work, in this case, procurement, would be impossible." This medicine and BMHP will not be achieved or will not be implemented without the established institutional organization, such as in our SOTK there is something called the Medical Support Sector which is responsible for everything from planning to the goods being removed, the division of tasks and authorities is of course in accordance with the field, which is automatically institutionally in accordance with the transfer of its main duties and functions."*

Interviews with several other technical informants revealed a discrepancy between the formal structure and its implementation practices, as follows:

> *"The organizational structure is not yet optimally implemented in the Pharmacy Installation, the organizational structure is not fully implemented."*

This indicates a gap between the normative organizational design and the operational reality in the field. This problem is common in public bureaucratic systems, where task execution often relies on individual initiative or informal relationships between personnel rather than standard structural procedures.

> *"In the Pharmacy Warehouse, the highest-ranking officer is the Installation Head, followed by three Warehouse Heads, the Head of the Inpatient Pharmacy, and the Head of the Outpatient Pharmacy. Each of these three has their own duties that support drug management and BMHP, so far, has had its division of tasks appropriate and is operating according to the SOP."*

The technical structure has been functioning well. However, without optimal synergy with the planning and policy-making departments, this technical function could lose its effectiveness in the long term. From the perspective of clinical staff, Dr. Andi Rahmawati, Sp.PD, an Internal Medicine Specialist, stated that the organizational function is functioning properly. The following is an excerpt from the interview:

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"The organizational structure is appropriate because there is a responsible pharmacist and all the requirements are already in the E-Resep application."

This indicates that the benefits of the organizational function are beginning to be felt in the service sector. However, this success appears to be sector-specific and not evenly distributed across all units. The success of the organizational function in a public service organization, including hospitals, is determined by three factors: a clear structure, alignment between roles and responsibilities, and the effectiveness of coordination mechanisms. Based on the above findings, Nunukan Regency Hospital has an adequate formal organizational structure, but still requires improvements in implementation, strengthening cross-unit coordination, and internalizing a procedure-based work culture.

Therefore, relevant recommendations for improving the organizational function at Nunukan Hospital include: re-drafting and disseminating SOPs between units, establishing a regular internal coordination forum, and improving the managerial competency of human resources who play key roles in the pharmaceutical logistics system. From an organizational perspective, Nunukan Regency Hospital already has a clear organizational structure based on the Organizational Structure and Work Procedures (SOTK). The Medical Support Division is fully responsible for the procurement process, while the Pharmacy Unit is the technical unit that manages drug inventory and distribution. The Head of the Pharmacy Warehouse, along with the Heads of the Outpatient and Inpatient Pharmacies, are responsible for carrying out daily operational functions in accordance with their respective duties and functions.

However, the implementation of this organizational structure is considered less than optimal. Several informants reported that cross-unit coordination remains inconsistent, particularly regarding communication regarding drug stock shortages or excess stock. Furthermore, some reported overlapping duties in some departments, as well as inconsistent implementation of standard operating procedures (SOPs) across all departments. Interviews also revealed that the Pharmacy and Therapeutics Committee (KFT) is expected to strengthen coordination between pharmacists and medical personnel in formulary development and drug use evaluation. However, several informants assessed that the KFT's function has not been optimal due to limited human resources and limited time for coordination meetings.

Implementation Function

The implementation function is the core of the managerial process, where planning and organization are tested through actual implementation in the field. In the context of managing drugs and disposable medical materials (BMHP) at the Nunukan Regency General Hospital, implementation is a crucial element that determines whether health service objectives can be achieved effectively and efficiently.

"Distribution from each section or division flows to the pharmacy, which then flows to the pharmacy warehouse, where it is distributed to the relevant units."

This flowchart demonstrates a structured implementation system that aligns with the principles of healthcare logistics management.

"Implementation is in accordance with SOPs and is carried out consistently, but of course, all variables in the management function have challenges, including planning. When outdated data is entered and is inconsistent, our planning data will be hampered in further procurement. Implementation challenges should involve the e-catalog process, but when there is a stock shortage at the agent or distributor, we run out of stock, and ultimately, we resort to direct appointments. This direct appointment is also

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hampered by outstanding debts. Another obstacle is our location on the northern border, so prices differ from those on Java, requiring high shipping costs, weather constraints, and expeditionary forces."

One of the dominant issues is delayed payments to distributors, which causes obstacles in ordering medicines through the e-catalog. When payments are not completed within the specified time limit (for example, 60 days), the distributor will close the account, preventing the hospital from placing further orders. This directly impacts the availability of medicines and BMHP in the field, forcing the hospital to resort to direct appointments, which in turn increases the risk of inefficiency and procurement delays.

The geographical location of Nunukan Regional Hospital, located in a border area, further exacerbates the situation. High shipping costs, limited transportation modes, and weather factors create unique logistical challenges not experienced by hospitals in urban areas or distribution centers. This is a differentiating factor. This is crucial in analyzing pharmaceutical management implementation in border areas, where geography significantly impacts the supply chain.

"The distribution process also follows the SOP, with distribution from the warehouse to the depot, and the space is in accordance with its function and utilization, and procedures are consistently implemented."

Even though the billing system is in place, errors often occur, such as inconsistencies in the inputted medication quantities with the actual physical reality. These disruptions impact data validity, delay service delivery, and undermine user confidence in the reliability of information management. This is a crucial consideration in modern management, where information system reliability is the backbone of effective policy implementation.

Overall, the implementation of medication management and BMHP at Nunukan Regional Hospital adheres to established procedures, but still faces structural, technological, and geographical challenges. From an academic perspective and practical experience as a researcher, several areas need to be strengthened in this implementation function. First, there is the need to improve integration between logistics, finance, and clinical systems to prevent fragmentation of the implementation process. Second, strengthening information systems and human resource training are urgently needed to reduce errors in the billing and distribution systems. Third, improving the payment mechanism to prevent the hospital from experiencing account closing from distributors is essential to ensure supply chain continuity. Within the framework of hospital management, effective implementation reflects the alignment of policies, organizational structure, resources, and technology. Therefore, Nunukan Regional Hospital needs to adopt a systemic approach so that the implementation function is not merely administrative but also reflects a commitment to fair, responsive, and sustainable quality healthcare services especially for communities in border areas with limited access to healthcare.

The implementation of medication management and BMHP at Nunukan Regency Hospital has generally followed applicable standard operating procedures. The distribution process is carried out in stages, starting from the pharmacy warehouse to the pharmacy, then forwarded to service units based on the submitted requests (amprah). An electronic billing system is used to record drug expenditures and BMHP, thus minimizing recording errors. However, obstacles still frequently arise during the implementation phase. Most informants reported that disruptions in the billing system, such as discrepancies between physical quantities and the amounts recorded in the system, still occur frequently and impact data accuracy. Furthermore,

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late payments to distributors hamper the drug ordering process, ultimately impacting stock availability in the warehouse. The geographic location of Nunukan Regional Hospital, located in a border area, also presents challenges. High shipping costs and dependence on distribution from outside the region make the procurement process more time-consuming. Several informants also stated that when stock is out of stock in the e-catalog, the hospital must make direct appointments with suppliers, but this, too, is often hampered by administrative issues and budget constraints.

Supervisory Function

Supervision is a fundamental function in the management cycle, serving as a control tool to ensure that plans are implemented in accordance with organizational standards, policies, and objectives. In the context of managing drugs and consumable medical materials (BMHP), the supervisory function is vital to ensuring accountability, distribution efficiency, and the security of pharmaceutical logistics stocks. The implementation of the oversight function has been attempted in various forms, although its implementation is not yet fully consistent and integrated. The following is an excerpt from an interview:

> *"We conduct quarterly monitoring of drug use and BMHP by Management. External and internal audits are also conducted. Any findings from the evaluation process must be followed up as soon as possible to avoid future or recurring problems."*

Monitoring of drug use and BMHP is conducted periodically, namely quarterly, involving both internal and external audits. These routine evaluations serve as the basis for taking follow-up action if any discrepancies are found, thereby minimizing the potential for recurrence of errors. This demonstrates managerial awareness of the importance of the evaluative function as part of responsive organizational governance.

> *"There must be working papers prepared by each PPTK and officials involved in drug procurement and BMHP as a monitoring and evaluation tool. This is also supported by the use of digital applications for accountability and transparency. The oversight function is assisted by Staff from the Medical Support Section, inventory managers, and Pharmacy officers in the Warehouse and Pharmacy, are supervised by external bodies, namely the BPK, BPKP, Inspectorate, and internal bodies from the SPI. Special audits are conducted when there are debts that must be reviewed or investigated specifically."*

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Oversight of medication management and BMHP at Nunukan Regency Hospital is implemented through internal and external mechanisms. Internal oversight is conducted by the Internal Supervisory Unit (SPI), the Inspectorate, and hospital management through periodic stocktaking and quarterly evaluations of medication use. Meanwhile, external oversight is conducted by the Supreme Audit Agency (BPK) and the Financial and Development Supervisory Agency (BPKP). Although the oversight system is in place, some informants believe its implementation is not yet fully consistent and comprehensive. Some staff in the Pharmacy Unit even conduct independent monitoring to ensure data is always ready for auditors' requests. Informants also revealed that follow-up on audit results still needs to be improved to prevent similar issues from recurring. Furthermore, not all service units routinely report medication use to the Pharmacy Unit, complicating the evaluation process. Several informants suggested integrating medication use reports with the hospital information system to make the oversight process more effective and real-time.

Efficiency and Effectiveness

Efficiency and effectiveness are key indicators in assessing the success of pharmaceutical logistics management in hospitals. Efficiency refers to how resources are optimally utilized without waste, while effectiveness emphasizes the extent to which management objectives, namely the availability and distribution of drugs and BMHP, are achieved in accordance with healthcare service standards. In the context of the Nunukan Regency Regional General Hospital, findings from in-depth interviews with informants indicate that efforts to improve efficiency and effectiveness have been gradually implemented, although structural and systemic challenges remain that require attention.

> *"There are still areas for improvement because, in my opinion, there are still gaps, but we remain effective and efficient, moving towards good management. At Nunukan Regional Hospital, there have been no cases of overstock, but rather stock shortages. What needs to be improved in medical logistics management going forward is improved planning. If planning is good, then shortages of books can be resolved effectively."*

Stock shortages remain an issue that needs to be addressed immediately through more accurate planning. Effectiveness in logistics management, he said, is highly dependent on the quality of initial planning, a view that aligns with the principles of supply chain management in healthcare.

> *"Management continues to improve to strive for efficiency and effectiveness in managing medicines and BMHP. For Logistics Management, learning from past experience, what we need to improve is the availability of adequate space, including expanding facilities and infrastructure in accordance with applicable regulations."*

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Infrastructure remains a barrier to increasing efficiency. Limited storage space and other supporting facilities impact hospitals' capacity to optimally manage inventory.

> *"Our colleagues at the Pharmaceutical Department have strived to be effective and efficient. They have demonstrated to Management that they use distributors with significantly lower prices and can obtain more goods, while maintaining the same benefits. So, I think their management is sound, as they also use the price limits outlined in the RKA (Work Budget Plan) and RKO (Drug Requirements Plan). For medical logistics, doctors must prescribe medications according to the quality and quantity based on the national formulary and the accuracy of the diagnosis, so there's no waste. Similarly, injectable medications, which should be used multiple times, are ultimately used only once, and the remainder must be discarded. Distributing them into specific doses requires a special, qualified room, such as a sterile room, and the equipment is expensive. So, we're all in the process, knowing where we need to improve".*

From a technical operational perspective, the Pharmaceutical Department has implemented budget-efficient procurement without sacrificing drug quality. For example, selecting distributors with lower prices but equivalent quality, and using planning parameters based on the RKA and RKO. He also highlighted the importance of clinical discipline in prescribing medications according to the national formulary and accurate diagnosis to prevent waste, particularly for injectable medications that are single-use but have the potential for dual use if supported by adequate sterility facilities.

Serious budgetary issues indicate a discrepancy between the planned drug needs (approximately Rp 10 billion per year) and the actual budget, which only reached around Rp 4 billion. This discrepancy results in the hospital's inability to meet all drug needs, leading patients to frequently purchase external medications and demand reimbursement. This situation can actually increase hospital expenses, as the cost of externally sourced drugs tends to be higher than that of internally sourced drugs. The effectiveness and efficiency of medication and BMHP management at Nunukan Regency Hospital is on track, although it has not yet reached ideal levels. Supporting factors include data-driven planning, disciplined use of formularies, careful vendor selection, and commitment to SOPs. However, key challenges that remain include: (1) budget constraints, (2) issues with the billing information system, (3) inadequate warehouse capacity, and (4) a weak forecasting system in emergency situations.

Therefore, from a strategic management and public policy perspective, strengthening three key aspects is necessary: first, improving the capabilities of the integrated pharmaceutical information system to support the validity and consistency of medication management data; second, reformulating risk-based procurement strategies, particularly to address unforeseen situations such as pandemics; and third, strengthening clinical needs-based planning and the efficiency of medication use at the service level. In terms of efficiency and effectiveness, most informants stated that medication and BMHP management at Nunukan Regency Hospital has shown improvement compared to previous years. No major overstock cases were found, but out-of-stock cases still frequently occur, especially for certain medications with limited supply.

Several efficiency measures have been implemented, including selecting distributors with more competitive prices, limiting the procurement of non-vital medications such as vitamins, and implementing the rolling of excess medications between units to prevent expiration. Patients interviewed also stated that medication availability in the hospital has improved, although they still occasionally have to purchase medications outside the hospital when the hospital runs out of stock. In general, informants agreed that efficient and effective medication management has a direct impact on the quality of patient care. When medications are readily available, service

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times are faster and patient satisfaction increases. Conversely, when out-of-stock situations occur, patients are forced to purchase medications outside the hospital, which is often more expensive and reduces trust in the hospital's services. The research results indicate that the planning process at Nunukan Regional General Hospital (RSUD Nunukan) already utilizes the consumption method, VEN (Vital, Essential, Non-Essential) analysis, and ABC. However, the information system supporting decision-making remains manual and unintegrated. This results in data delays and makes it difficult to accurately predict drug needs. The findings at RSUD Nunukan indicate that the lack of a standardized hospital formulary is also a fundamental weakness in determining needs. This results in drug selection still tending to be based on disease patterns and physician order data, rather than comprehensive epidemiological data. One possible improvement is strengthening the Pharmaceutical Logistics Management Information System (SIML-F), which is integrated with the financial and medical service systems. This system can facilitate real-time monitoring of drug stocks, demand planning, and reduce the risk of drug shortages and overstocks. The organizational structure of RSUD Nunukan essentially follows BLUD standards, with divisions into pharmacy, warehouse, and financial management units. However, the research revealed that coordination between units remains weak. The Pharmacy and Therapeutics Committee (KFT), which should be at the forefront of formulary and therapy policy development, has not been functioning optimally. This results in a lack of clarity in determining drug needs. Weak coordination also leads to communication delays between the pharmacy and procurement departments, resulting in frequent stock delays. Possible solutions include strengthening the role of the pharmacy department through regular meetings, training, and developing clearer standard operating procedures (SOPs) that outline the communication flow between units. This will allow for better coordination in decisions regarding drug selection.

Drug management at Nunukan Regional Hospital follows standard operating procedures (SOPs), particularly for storage, distribution, and patient care. However, technical challenges, such as the BPJS billing system, cause delays in payments to Pharmaceutical Wholesalers (PBF). Consequently, procurement processes are often delayed, impacting drug availability. Furthermore, Nunukan's geographical location as a border region also impacts smooth distribution. One innovation that needs to be developed is an early warning system for drug stocks, which can provide early warnings if drug stocks are approaching minimum levels. Furthermore, more strategic collaboration with local distributors is needed to expedite delivery, especially for vital drug items.

Supervision at Nunukan Regional Hospital is carried out by both internal (pharmacy unit, SPI) and external (Health Office, Supreme Audit Agency). However, research findings indicate that the monitoring mechanism is not implemented regularly and comprehensively. It is only conducted during audits or handovers. This weakness results in poor early detection of expired or slow-moving medications. However, strong oversight is key to ensuring effective planning and implementation. An ideal monitoring system would utilize barcode technology and an inventory application so that every medication received and sent out can be digitally recorded. Furthermore, drug stock evaluations should be conducted at least monthly to quickly identify excess or shortage items.

Suboptimal medication management directly impacts the quality of hospital services. Out-of-stock medications can decrease patient satisfaction and increase additional costs for patients who must purchase medications outside the hospital. However, improvements made by Nunukan Regional General Hospital in recent years have reduced the reimbursement system for JKN patients, although some branded medications remain unavailable. The implementation of management functions at Nunukan Regional General Hospital is ongoing but not yet

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optimal. Information system integration, strengthening of the KFT function, stricter oversight, and a more geographically adaptive procurement strategy are needed. These steps are expected to improve the efficiency and effectiveness of medication and BMHP management, thereby ensuring the quality of patient care.

Based on the discussion on the implementation of management functions in the management of Drugs and Medical Expendables (BMHP) at Nunukan Regency Regional General Hospital, it is clear that all these functions are operating but not yet fully optimal. Each management function contributes interrelatedly to achieving efficient and effective BMHP management, but weaknesses remain in several key aspects. Planning implemented using consumption methods, VEN analysis, and ABC is still hampered by an unintegrated information system. This impacts the accuracy of drug demand data and leads to shortages or excess stock. From an organizational perspective, the existing formal structure has not been fully supported by effective coordination, particularly in carrying out the role of the Pharmacy and Therapeutics Committee (KFT). The implementation function, despite following established procedures, faces obstacles in the procurement system, payment delays, and geographical border conditions that complicate drug distribution. Meanwhile, the oversight function has not been implemented routinely and comprehensively, resulting in limited early detection of pharmaceutical logistics issues.

These obstacles directly impact the quality of hospital services, particularly in terms of drug availability, timely service delivery, and patient satisfaction. Improvement efforts such as integrating the pharmaceutical logistics information system, strengthening the role of the KFT, enhancing technology-based oversight mechanisms, and adapting procurement strategies to geographic conditions need to be prioritized to improve pharmaceutical logistics governance at Nunukan Regency Hospital. Overall, this discussion demonstrates that efficient and effective management of BMHP requires strong synergy between data-driven planning, clear organization, disciplined implementation of SOPs, and strict and ongoing oversight. Optimizing these four management functions is expected to support improving the quality of health services, guarantee the availability of drugs, and increase public trust in the Nunukan District Hospital.

Conclusion

The planning function for managing medicines and prescription drugs (BMHP) at Nunukan Regency Hospital has been implemented using data-driven approaches, such as the consumption method, VEN analysis, and ABC analysis. Planning is conducted by considering the previous year's medication usage history and adding a 10–20% stock buffer. However, this process remains hampered by budget constraints and data delays, which impact the accuracy of planning and procurement. The organizing function demonstrates that an organizational structure is in place and the division of tasks between units, such as the pharmaceutical warehouse, pharmacy, and medical support units, has been determined. However, the implementation of the organizational structure is still not fully effective because several procedures have not been optimally implemented and there is still reliance on individual initiative. The implementation function for managing medicines and prescription drugs (BMHP) has been carried out in accordance with standard operating procedures (SOPs), particularly regarding distribution from the warehouse to the service depot and the use of the billing system. However, implementation still faces technical challenges, such as billing system disruptions, late payments to distributors, and delivery limitations due to the regional hospital's geographic location in a border area. The oversight function has been implemented through regular internal and external audits. Supervision is conducted by the Internal Audit Unit (SPI),

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the Inspectorate, the Supreme Audit Agency (BPK), and internal units. However, oversight at the technical and operational levels has not been optimal due to the lack of a consistent, integrated monitoring system. Some employees have initiated their own oversight initiatives as a form of accountability. The efficiency and effectiveness of medication and BMHP management at Nunukan Regional Hospital are considered quite good and have improved compared to previous years. No major overstock cases were found, but out-of-stocks still occur, especially for specialty and expensive medications. The single-door system and efficient use of distributors have supported effectiveness, although challenges remain due to budget constraints, administrative systems, and limited storage space that meets standards. Internally, budget constraints, inconsistent planning data, distribution delays, an unstable billing system, and a suboptimal organizational structure are key challenges. Externally, the geographic location of the border impacts logistics time and costs, as well as fluctuating drug prices from distributors. Furthermore, reliance on e-catalogs and national procurement procedures also pose obstacles when urgent drug needs cannot be met immediately. When management is carried out efficiently and accurately, drug availability increases, patients do not need to purchase drugs outside the hospital, and service times are faster. Conversely, when stockouts or delays in distribution occur, this impacts patient complaints, delays in medical procedures, and increases the patient's cost burden. Effective management also supports budget savings, prevents drug waste, and increases hospital service accountability. Therefore, improving integrated medical logistics management functions will have a direct impact on improving the overall quality of healthcare services.

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