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Evaluation of the Pharmaceutical Service System Based on Regulation of the Minister of Health of the Republic of Indonesia Number 72 of 2016 at the Regional Hospital Eduardo Ximenes Baucau Timor-Leste

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ABSTRACT
Pharmaceutical services are a crucial component of the hospital healthcare system. The Eduardo Ximenes Regional Hospital (HoREX) Baucau faces challenges in managing its pharmaceutical services due to the lack of established standards. This study aims to evaluate the pharmaceutical services system at HoREX Baucau based on Indonesian Minister of Health Regulation No. 72 of 2016, covering aspects of drug planning, procurement, and distribution. The research method used a qualitative approach with a case study, through in-depth interviews with four informants, observation, and document review. Data validity was strengthened through triangulation and analysis using NVIVO. The results showed that the pharmaceutical services system did not fully meet standards. Planning and procurement were categorized as "not yet in accordance" with the following key gaps: the absence of a formulary, a manual recording system, a long procurement process (3-6 months), and limited quality control. Distribution was categorized as "partially in accordance" but required significant improvement. Drug availability only reached 75-85%, below the target of 95%. Recommendations include developing a hospital formulary, implementing an integrated information system, revitalizing the Pharmacy and Therapeutics Team, increasing human resource capacity, and improving infrastructure. National regulations regarding pharmaceutical service standards in Timor-Leste are needed.

KEYWORDS: Pharmaceutical Services, Drug Planning, Drug Procurement, Drug Distribution

INTRODUCTION

Medicines and pharmaceutical supplies are a crucial component supporting hospital services. They must be managed effectively and efficiently, both in terms of type, quantity, and quality. Ineffective management can lead to poor quality healthcare services, both medically and socioeconomically, and a decline in public trust in the hospital's function.

Hospitals are public healthcare institutions with unique characteristics influenced by developments in health science, technological advancements, and the socioeconomic life of the community. They must continue to improve their services, providing higher-quality and affordable services to achieve the highest level of health (Parlamento Nacional, 2004).

Meanwhile, health is a fundamental right of every individual, and all citizens have the right to access healthcare. The 2004 Constitution of the Democratic Republic of Timor-Leste (RDTL) concerning the national social security system mandates protection for widows, orphans, the poor, abandoned children, the displaced, and veterans, with all healthcare costs guaranteed by the government (Republica Democratica de Timor-Leste, 2002).

Timor-Leste's National Health System consists of subsystems of health efforts, health financing, human resources for health, medicines and medical supplies, community empowerment, and health management. Each subsystem is highly dependent on the health financing subsystem. Within the health financing subsystem, a national social security system has been developed, established by Decree No. 11 of 2003. Social security, including social health insurance, consistently implements universal principles and aligns with the mandate of the 2002 Timor-Leste Constitution (Republica Democratica de Timor-Leste, 2002).

The Eduardo Ximenes Regional Hospital (HoREX) Baucau is a health service institution owned by the Timor-Leste government. It provides comprehensive individual health services, including inpatient, outpatient, and emergency care. It is tasked with fulfilling the mandate of the RDTL constitution to ensure health services in Timor-Leste, which must be managed effectively and efficiently to achieve the goal of ensuring quality health services. One of the problems that influences the quality of services at the Eduardo Ximenes Regional Hospital (HoREX) Baucau Timor-Leste is the management of pharmaceutical services (Ministry of Health of the Republic of Indonesia, 2016a) and is the main task and function of the pharmaceutical installation of the Eduardo Ximenes Regional Hospital (HoREX) Baucau, meaning that pharmaceutical services at HoREX Baucau are centralized in the pharmaceutical installation.

The primary challenges in pharmaceutical service management at the HoREX Baucau Pharmacy Installation are the planning,

procurement, and distribution of pharmaceutical services. Preliminary observations revealed the primary problem was the lack of pharmaceutical service standards in hospitals based on laws or ministerial regulations. This makes it difficult to evaluate pharmaceutical services. Therefore, in this study, the researchers evaluated the implementation of pharmaceutical services based on Indonesian Minister of Health Regulation No. 72 of 2016. This Ministerial Regulation was used because, in the health sector, health standards in one country (Indonesia) can serve as a reference for other countries (Timor Leste).

Based on the author's observations as an employee at HoREX Baucau, the drug availability rate is below 95% (the drug availability indicator set for hospital accreditation in Timor Leste is 95%), a high number of damaged and expired drugs, a high number of changing drug requests from prescribers, delays in drug delivery from suppliers, a high number of duplicate prescriptions, the suboptimal function of the pharmacy and therapeutics committee in developing policies and evaluating drug management, which affects the selection, planning, distribution, and use of drugs in the hospital, the quantity and quality of human resources and regulations, a lack of knowledge and skills regarding drug management standards, which impacts the low quality of drug management, the absence of regulations/policies/standards for drug management, which affects the quality of drug management at HoREX Baucau, facilities and infrastructure, and the lack of a dedicated room for damaged and expired drugs, resulting in a decline in drug quality. Supporting equipment is still lacking due to the lack of procurement of supporting equipment such as computers/software that can help facilitate pharmaceutical work.

Drug control cannot be separated from drug logistics management. Drug control can provide a basis for further planning based on stocktaking results. Stocktaking is a form of storage control that evaluates expired or near-expired stock, damaged medications, incoming and outgoing medications based on stock cards, and fast-moving and slow-moving categories. Drug shortages frequently occur during the distribution stage, disrupting healthcare services in hospitals.

RESEARCH METHODOLOGY

This research is a qualitative case study approach that examines the pharmaceutical service system implemented in accordance with the Regulation of the Minister of Health of the Republic of Indonesia No. 72 of 2016 at the Eduardo Ximenes Regional Hospital (HoREX) Baucau, Timor-Leste.

Profile of Research Informants

This research was conducted using an evaluation using internationally tested and recognized standards, namely Regulation of the Minister of Health of the Republic of Indonesia No. 72 of 2016 concerning Pharmaceutical Service Standards in Hospitals. The use of these standards is expected to provide an objective picture of the condition of pharmaceutical services at HOREX Baucau and provide constructive recommendations for improvement.

The characteristics of the informants from this study are presented in Table 4.1 below:

Table 4.1. Characteristics of Research Informants

No	Informant Code	Position	Years of service
1	Informant 1	Head of Hospital Pharmacy Installation	8 years
2	Informant 2	Hospital management in charge of IFRS	12 years
3	Informant 3	Pharmacy Installation Officer	5 years
4	Informant 4	Pharmacy Installation Officer	3 years

Source: Research data (2025)

The table above shows that the research informants consisted of four individuals with different backgrounds but with direct relevance to the pharmaceutical service system at HoREX Baucau. Informant 1, the Head of the Pharmacy Unit, has eight years of service and serves as a key informant with a comprehensive understanding of pharmaceutical service systems and procedures. Informant 2, a hospital leader overseeing IFRS with 12 years of service, provides a managerial and policy perspective. Meanwhile, Informants 3 and 4, executive officers in the Pharmacy Unit with five and three years of service, respectively, provide an overview of operational implementation in the field.Research Instrument Triangulation Test Triangulation is a data validity checking technique that utilizes something other than the data itself to verify or compare the collected data. In this study, triangulation was conducted to ensure the credibility, validity, and reliability of data obtained from various sources and data collection methods. Data Source TriangulationSource triangulation was conducted by checking data obtained from multiple informant sources. In this study, data was collected from four informants with different positions and perspectives:a. Informant 1 (Head of the Pharmacy Unit) served as a key informant with a comprehensive understanding of the pharmaceutical service system from a managerial and technical

perspective.b. Informant 2 (Hospital Leader overseeing IFRS) provided a hospital-level policy and strategy perspective.c. Informants 3 and 4 (IFRS Officers) provided operational and field implementation perspectives.The results of source triangulation demonstrated consistency in data from various informants regarding the main issues in the pharmaceutical service system.All informants stated that the lack of standard operating procedures, limited human resources, and manual recording systems were the main obstacles. However, there were differences in perspectives regarding improvement priorities, with leaders placing greater emphasis on policy and regulatory aspects, while implementing officers focused more on operational needs such as information systems and infrastructure.

Table 4.2. Data Source Triangulation

Aspect	Informant 1 (Head of IFRS)	Informant 2 (Hospital Manager))	Informants 3 & 4 (IFRS Officers)	Conclusion Triangulation
Planning	The consumption method is used, but it is less accurate because the data is incomplete.	Planning is not optimal, the Pharmacy and Therapy Team is not effective	Difficulties in planning due to incomplete historical data and fluctuating demand	Consistency: Planning is not up to standard, requires a formulary and information system.
Procurement	The process is long (3-6 months), depending on the central system, and there are often stock shortages.	Supplier constraints and long import process, quality is sometimes not appropriate	Difficulty in acceptance due to lack of trained human resources and quality testing tools	Consistent: Procurement is inefficient, needs improvement in coordination and HR capacity
Distribution	Combination of floor stock and individual prescription systems, recording and monitoring challenges	Storage space issues in non-standard units pose a risk to drug quality.	Manual recording, delays in returning stock cards, and difficulty monitoring service units	Consistency:The distribution system needs improvements in monitoring and storage standards.
Drug Availability	Availability is 75-85%,below the target of 95%.	Drug availability remains low, affecting services.	Frequent shortage of essential medicines	Consistency:Drug availability is still below standard

Source: Research data (2025)

TRIANGULATION OF DATA COLLECTION METHODS

Triangulation of methods is conducted by using more than one data collection technique to obtain the same data. In this study, three data collection methods were used:

a. In-depth interviews to explore informants' information, perspectives, and experiences regarding the pharmaceutical care system.

b. Direct observation to observe the actual conditions of pharmaceutical care implementation in the field, including facilities, work processes, and documentation.

c. Document review to analyze related documents such as drug availability reports, drug usage data, planning documents, and procurement documents.

The results of the triangulation of methods demonstrate consistency between the data obtained from interviews, observations, and document review. For example, informants stated that record-keeping was still manual (interviews). This was confirmed through direct observation, which found record-keeping using stock cards and manual books. This was further reinforced by document review, which indicated the absence of an electronic database system.

Table 4.3. Triangulation of Data Collection Methods

Findings	Interview	Observation	Document Review	Validity
There is no hospital formulary yet.	All informants stated that there is no official formulary yet.	No formulary documents found	There are no formulary documents in the archives	Valid - Triple

Manual recording system	The informant explained how to record inventory using a manual stock card.	The use of stock cards and manual logbooks was found.	The report was created using a simple MS Excel tool.	Valid - Triple Checked
Drug availability: 75-85%	Informants stated that stockouts often occur.	Observations found several e mpty medicine shelves.	Reports show 75-85% availability	Valid - Triple Checked
Procurement process 3-6 months	The informant explained that the procurement process took a very long time.	Observations on the process flow show that there are many stages.	Procurement documents indicate a 3-6 month lead time from order to delivery.	Valid - Triple Checked

Source: Research data (2025)

THEORY TRIANGULATION

Theory triangulation is conducted by using more than one theoretical perspective to address the problem under study. In this study, theory triangulation was conducted by comparing field findings with:

a. Regulation of the Minister of Health of the Republic of Indonesia No. 72 of 2016 as the primary standard used as a reference for evaluation.

b. Pharmaceutical logistics management theories from various literature that explain the principles of effective and efficient medication management.

c. Relevant previous research results (Sari, 2021; Yusuf, 2020; Wulandari, 2020; Arifin, 2019; Simanjuntak, 2022; Dewi, 2021) that provide empirical perspectives on the implementation of pharmaceutical services in various hospitals.

d. International best practices in pharmaceutical care and hospital pharmacy management.

The results of the theory triangulation indicate that the findings in HoREX Baucau are consistent with previous research findings in various developing countries, where the lack of standard operating procedures, limited resources, and manual systems are common obstacles in hospital pharmacy services. This strengthens the validity of the research findings and demonstrates that the problems encountered are not isolated cases but rather systemic challenges in health system development.

RESEARCH DATA PRESENTATION

The data presented in this study are the results of data collection through in-depth interviews, observations, and document reviews conducted at the Eduardo Ximenes Regional Hospital in Baucau. The data presented covers three main aspects of pharmaceutical services: planning, procurement, and distribution of drugs and pharmaceutical supplies. The following is a presentation of the data for each aspect studied.

PHARMACEUTICAL SERVICE PLANNING

Based on the interview with Informant 1 (Head of the Pharmacy Installation), the drug needs planning process at HoREX Baucau is conducted quarterly. The planning method used is the consumption method, which is based on drug usage data from the previous period. Informant 1 stated:

"We plan drugs every three months by looking at consumption data from the previous period. However, our planning is often inaccurate due to fluctuating doctor requests, and we do not yet have an integrated information system to support this planning process."

- An interview with Informant 2 (Hospital Manager) revealed that drug requirement planning does not yet involve a comprehensive analysis of disease patterns and epidemiological data. Informant 2 explained:
- "We actually recognize the importance of disease pattern-based planning, but limited human resources and the lack of standardized protocols make it difficult for us to implement it. The Pharmacy and Therapeutics Team is also not optimal in providing input for planning."
- The researchers' observations revealed that existing planning documents are still rudimentary and do not follow a comprehensive standard format. There is no officially established hospital formulary, although a list of commonly used medications exists. Drug usage data is recorded manually and is not yet properly computerized.
- Informants 3 and 4 (IFRS Officers) stated that in their daily practice, they often face difficulties in planning due to:
- Lack of complete and accurate historical data
- Changing patterns of drug demand from service units
- Budget limitations that are not commensurate with needs
- Lack of standard planning guidelines or SOPs

- Pharmaceutical Service Procurement
- The drug procurement process at HoREX Baucau is carried out through a centralized system coordinated by the Timor-Leste Ministry of Health. Based on an interview with Informant 1, the procurement process takes quite a long time, from planning to the drugs being received at the hospital. Informant 1 explained:
- "Our drug procurement is highly dependent on the central-level process. After we submit a request, the process can take 3-6 months. This often results in stockouts, especially for essential drugs."
- Informant 2 added that coordination with suppliers is also a challenge in the procurement process. Delays in deliveries from suppliers, both local and international, frequently occur and affect drug availability at the hospital. Informant 2 stated:
- "We face challenges with suppliers. Not all drugs are available in Timor-Leste, so they have to be imported. This import process is time-consuming and expensive. Furthermore, the quality of the drugs sometimes does not meet specifications."
- Observations of procurement documents indicate that the drug receipt process does not fully follow standard procedures. Quality checks on received drugs are still limited to physical inspections of packaging and expiration dates, not including detailed technical specifications. Documentation of received goods is also not systematically stored.
- Informants 3 and 4 explained that they often encounter difficulties in the drug receipt process due to:
- - Lack of trained personnel to conduct drug quality checks
- Lack of adequate quality testing tools
- Unstandardized documentation
- Frequent discrepancies between orders and goods received

PHARMACEUTICAL SERVICE DISTRIBUTION

The drug distribution system at HoREX Baucau uses a combination of a floor stock system (a complete inventory in the room) for emergency medications and an individual prescription system for outpatients and inpatients. Informant 1 explained:

“We use a combined system for drug distribution. For inpatient wards and the Emergency Department, we provide floor stock for frequently used medications. For patients, we distribute medications based on doctor's prescriptions. However, the main obstacle is inadequate stock recording and monitoring”.

Observations showed that drug distribution to service units was not carried out on a regular schedule. Drug requests from service units were often sudden and unplanned, making it difficult for the Pharmacy Unit to manage distribution. Informant 2 added:

“Drug distribution problems are also related to limited storage space in service units that does not meet standards. Drugs are often stored in conditions that do not meet temperature and humidity requirements. This poses a risk to drug quality.”

Informants 3 and 4 stated that they faced various obstacles in the distribution process, such as:

- A manual distribution recording system
- Delays in returning stock cards from service units
- Difficulties in monitoring stock in service units
- The absence of an integrated information system
- Limited distribution staff, especially outside of working hours

Secondary data in the form of drug availability reports indicate that the percentage of drug availability at HoREX Baucau in the last three months has ranged from 75-85%, still below the established drug availability indicator standard of 95%. Drugs frequently out of stock include antibiotics, antihypertensives, antidiabetics, and medications for chronic diseases.

Data Analysis

Data analysis in this study was conducted by comparing the implementation of the pharmaceutical service system at HoREX Baucau with the standards stipulated in Regulation of the Minister of Health of the Republic of Indonesia Number 72 of 2016. The analysis was conducted for each aspect studied: drug planning, procurement, and distribution.

Pharmaceutical Service Planning Analysis

Based on Indonesian Minister of Health Regulation No. 72 of 2016, drug needs planning must be carried out to determine the quantity and period of pharmaceutical procurement, considering the criteria of appropriate type, quantity, timeliness, and efficiency. Planning must use accountable methods such as consumption methods, epidemiology, or a combination of both, adjusted to the available budget.

The analysis shows that drug needs planning at HoREX Baucau does not fully meet established standards. Although the consumption method is used, its implementation still faces various limitations. Some of the identified gaps are:

a. The absence of an officially established hospital formulary in accordance with the drug selection standards stipulated in the Minister of Health Regulation. This formulary is an important basis for the drug selection and planning process.

b. Planning does not comprehensively consider epidemiological data and disease patterns. The Minister of Health Regulation emphasizes the importance of combining consumption and epidemiological methods for more accurate planning.

c. The role of the Pharmacy and Therapeutics Committee/Team in the planning process is not yet optimal. The Minister of Health Regulation mandates that drug selection and planning must involve the Pharmacy and Therapeutics Team, which provides evidence-based recommendations.
d. The drug usage data recording and reporting system is still manual and not yet integrated, making analysis difficult for subsequent planning periods.
e. There is no standard operating procedure (SOP) for the drug requirements planning process.
Inaccuracies in planning directly impact drug availability. Data show that drug availability only reaches 75-85%, far below the 95% target. This indicates that a suboptimal planning process is a contributing factor to drug stock shortages.
Analysis of Pharmaceutical Services Procurement
Minister of Health Regulation No. 72 of 2016 states that procurement is an activity to realize needs planning by ensuring availability, quantity, and timing at affordable prices and in accordance with quality standards. Procurement must be continuous, starting from selection, determining quantity, adjusting needs and funding, selecting procurement methods, selecting suppliers, determining contract specifications, monitoring the process, and finally payment.
Analysis of the procurement process at HoREX Baucau revealed several non-compliances with established standards:
l. The procurement process is too long (3-6 months) from planning to receiving drugs, far exceeding the ideal waiting time. The Minister of Health Regulation emphasizes the importance of time efficiency in procurement to prevent stockouts.
a. The drug receiving process does not meet standards. The Minister of Health Regulation stipulates that receiving drugs must ensure that the type, specifications, quantity, quality, delivery time, and price match the physical condition received. At HoREX Baucau, quality checks are still limited to physical aspects and expiration dates.
b. Documentation of goods received is not properly and systematically stored. This is despite the Minister of Health's regulation emphasizing that all documents related to receiving drugs must be properly stored for audit and tracking purposes.
c. Limited trained human resources and adequate quality testing equipment to conduct technical specifications checks on received drugs.
d. Suboptimal coordination with suppliers, resulting in late deliveries and sometimes non-conformity to ordered product specifications.
e. These limitations in the procurement process result in frequent drug shortages, especially for essential drugs. This impacts the quality of healthcare services in hospitals and reduces patient confidence in hospital pharmacy services. Analysis of Pharmaceutical Service Distribution
f. According to the Indonesian Minister of Health Regulation No. 72 of 2016, distribution is a series of activities that deliver pharmaceutical preparations from storage locations to service units/patients while ensuring quality, stability, type, quantity, and timeliness. Hospitals must determine a distribution system that ensures the implementation of supervision and control of pharmaceutical preparations in service units.
g. According to the Minister of Health Regulation, distribution systems that can be implemented include a complete inventory system in the room (floor stock), an individual prescription system, a unit dose system, or a combination system. An analysis of the distribution system at HoREX Baucau shows:
a) HoREX Baucau has implemented a combined system of floor stock and individual prescriptions, which aligns with the Minister of Health Regulation recommendations. However, its implementation has not been optimal due to a lack of stock supervision and control in service units.
b) Manual distribution recording complicates monitoring and control. The Minister of Health Regulation emphasizes the importance of a sound management information system to support effective distribution.
c) Drug storage in service units does not meet pharmaceutical requirements. The Minister of Health Regulation stipulates that storage must guarantee quality and safety according to requirements for stability, sanitation, light, humidity, and ventilation.Belum diterapkannya sistem unit dosis yang merupakan sistem distribusi paling aman dan efisien menurut standar internasional.
Keterbatasan SDM untuk distribusi, terutama di luar jam kerja, mempengaruhi ketepatan waktu Drug distribution to service units.
l. The lack of an effective stock control mechanism in service units, resulting in stockpiling in some units while others experience shortages.
This gap in the distribution system impacts the efficiency of drug use and patient safety. Untimely distribution can lead to delays in therapy, while substandard storage risks reducing drug quality and endangering patient safety.

Table 4.4. Summary of Analysis of Compliance of Pharmaceutical Services at HoREX Baucau with Indonesian Minister of Health Regulation No. 72 of 2016

Aspect	Minister of Health Regulation Standard No. 72/2016	Conditions at HoREX Baucau	Suitability
Planning	Using consumption, epidemiological, or combination methods; based on hospital formularies; involving the Pharmacy and Therapeutics Team; having clear SOPs	Using a simple consumption method; no official formulary yet; Pharmacy and Therapy Team is not yet optimal; no standard SOP yet	Not Appropriate
Procurement	Efficient and timely; comprehensive quality inspection; orderly documentation; good supplier coordination	Long process (3-6 months); limited quality control; documentation is not yet systematic; supplier coordination is problematic	Not Appropriate
Distribution	A system that ensures supervision and control; standardized storage; integrated record-keeping; and effective stock monitoring.	Combination system of floor stock and individual recipes; non-standard storage; manual recording; weak stock monitoring	Partially Appropriate

Source: Research data (2025)

Based on the table above, it can be concluded that the pharmaceutical service system at HoREX Baucau, in terms of planning and procurement, does not yet comply with the standards of the Indonesian Minister of Health Regulation No. 72 of 2016. While the distribution aspect is partially compliant but still requires significant improvement.

DISCUSSION OF RESEARCH RESULTS

This discussion of research results will elaborate on the findings obtained from the data analysis and relate them to theory, previous research, and the standards stipulated in the Indonesian Minister of Health Regulation No. 72 of 2016. The discussion focuses on three main aspects: planning, procurement, and distribution of pharmaceutical services.

Discussion of Research Results: Pharmaceutical Service Planning

The results of this study indicate that the implementation of drug needs planning at HoREX Baucau does not fully comply with the standards stipulated in the Indonesian Minister of Health Regulation No. 72 of 2016. This finding aligns with research by Sari (2021), which concluded that planning based on consumption data alone is insufficient to produce accurate planning; integration with epidemiological data and disease patterns is necessary.

Indonesian Minister of Health Regulation No. 72 of 2016 emphasizes that planning must use accountable methods, namely consumption methods, epidemiology, or a combination of both. Although HoREX Baucau has used consumption methods, it has not integrated them with epidemiological data. This results in planning being unable to anticipate changes in disease patterns or drug needs for specific health programs.

The importance of the hospital formulary as a basis for planning has also not been realized in HoREX Baucau. According to the Minister of Health Regulation, drug selection must be based on a formulary compiled by the Pharmacy and Therapeutics Team, considering effectiveness, safety, quality, and price. The formulary serves as a guide for rational and efficient therapy selection. The absence of an official formulary in HoREX Baucau results in a lack of standard drug selection, resulting in less focused planning. Yusuf's (2020) research found that a lack of planning accuracy leads to inefficiencies in the procurement process and budget wastage. These findings are relevant to the situation in HoREX Baucau, where inaccurate planning contributes to drug stockouts and the potential for expired drugs. Data shows that drug availability is only 75-85%, indicating that suboptimal planning directly impacts drug availability.

The suboptimal role of the Pharmacy and Therapeutics Team is also a significant factor. The Minister of Health Regulation mandates that the Pharmacy and Therapeutics Team must actively provide input for drug selection and evaluation. At HoREX Baucau, the Pharmacy and Therapeutics Team has not yet fully implemented its role in the planning process. This aligns with research by Silva et al., which found that most hospital pharmacy units do not plan with clear goals and objectives, and lack standard guidelines guiding routines.

Limited information systems also pose a significant obstacle. Manual recording of drug usage data complicates analysis and evaluation for subsequent planning periods. The Ministry of Health's Regulation emphasizes the importance of a management information system that supports data-driven planning. Research by Dewi (2021) demonstrates that implementing an integrated information system can improve planning accuracy and medication management efficiency.

To improve planning quality, HoREX Baucau needs to make several fundamental improvements. First, develop and formally establish a hospital formulary with the involvement of a competent Pharmacy and Therapeutics Team. Second, develop a planning system that integrates consumption methods with epidemiological data and disease patterns. Third, develop clear Standard Operating Procedures (SOPs) for the planning process. Fourth, implement an integrated pharmacy management information system to support accurate data collection and analysis.

DISCUSSION OF RESEARCH FINDINGS ON PHARMACEUTICAL SERVICE PROCUREMENT

The drug procurement process at HoREX Baucau demonstrated non-compliance with the standards of the Indonesian Ministry of Health Regulation No. 72 of 2016, particularly in terms of time efficiency and procurement procedures. The Regulation stipulates that procurement must be effective, ensuring availability in the right quantities and at the right time, at affordable prices, and in accordance with quality standards. However, conditions at HoREX Baucau indicate that the procurement process takes 3-6 months, indicating inefficiencies in the procurement system.

This lengthy procurement process aligns with Wulandari's (2020) findings, which indicate that delays in procurement from suppliers lead to distribution delays and stock outages. In the context of HoREX Baucau, these delays are exacerbated by reliance on a centralized procurement system at the Ministry of Health and Timor-Leste's geographical challenges, which require imports for certain drugs.

Indonesian Ministry of Health Regulation No. 72 of 2016 stipulates that drug receipt must ensure compliance with the type, specifications, quantity, quality, delivery time, and price with the physical condition received. At HoREX Baucau, quality inspections of received medications are still limited to physical aspects and expiration dates. More detailed technical specification inspections have not been conducted due to limited trained personnel and quality testing equipment.

This limitation poses a risk to the safety and quality of medications distributed to patients. International standards emphasize the importance of quality assurance at every stage of medication management, including receipt. Incomprehensive inspections can result in substandard medications circulating in hospitals, endangering patient safety.

The lack of systematic storage of receipt documentation was also a significant finding. The Ministry of Health's regulation mandates that all documents related to the receipt of goods must be properly stored for audit, tracking, and evaluation purposes. Good documentation is part of good documentation practice, a fundamental principle of pharmaceutical management.

Simanjuntak's (2022) research highlights that procurement that is not integrated with the internal distribution system leads to stock imbalances between units. This is relevant to the situation at HoREX Baucau, where the lack of coordination between procurement and distribution processes leads to inefficiency and potential waste.

Coordination with suppliers also presents a challenge. The limited availability of local suppliers in Timor-Leste and the reliance on imports further complicate the procurement process. The Ministry of Health's regulation emphasizes the importance of selecting reliable suppliers and establishing clear contract specifications. HoREX Baucau needs to develop a supplier performance evaluation and monitoring system to ensure quality and timely delivery.

Improvements needed in the procurement aspect include: First, strengthening coordination with the Ministry of Health to expedite the centralized procurement process. Second, increasing human resource capacity in drug quality control through training and the procurement of adequate testing equipment. Third, establishing an orderly and standardized documentation system. Fourth, developing a systematic supplier evaluation mechanism. Fifth, establishing an early warning system to anticipate stockouts by shortening procurement lead times.

Discussion of Research Findings on Pharmaceutical Service Distribution

The drug distribution system at HoREX Baucau has implemented a combined floor stock and individual prescription system, which aligns with one of the distribution system options in Indonesian Minister of Health Regulation No. 72 of 2016. However, its implementation still faces various obstacles that impact distribution effectiveness.

The Minister of Health Regulation emphasizes that the distribution system must ensure the supervision and control of pharmaceutical supplies in service units. At HoREX Baucau, stock supervision and control in service units remains weak due to manual and unintegrated recording. This aligns with the findings of Arifin (2019), who found that unmonitored drug distribution resulted in some units experiencing stock shortages while warehouses still held excess.

Research by Dewi (2021) demonstrated that a computerized distribution system improves the accuracy of drug allocation and patient satisfaction. These findings indicate the importance of investing in a pharmaceutical management information system for HoREX Baucau. An integrated system will enable real-time monitoring of stock in service units, facilitate more timely distribution, and reduce the risk of stockouts or stockpiles.

Medication storage in service units is also a crucial concern. The Minister of Health Regulation stipulates that storage must ensure quality and safety, meeting requirements for stability, sanitation, light, humidity, and ventilation. Storage conditions in the HoREX Baucau service unit that do not meet standards risk drug quality degradation. Medications stored inappropriately at temperature and humidity levels can undergo physicochemical changes that affect their efficacy and safety.

The Minister of Health Regulation also regulates the storage of high-alert medications and LASA (Look-Alike, Sound-Alike) medications. These medications must be specifically labeled and not placed close together to prevent medication errors. Observations at HoREX Baucau indicate that the system for labeling and separating high-alert and LASA medications has not been consistently implemented, increasing the risk of medication errors.

Limited human resources for distribution, particularly outside of business hours, also impact service continuity. The Minister of Health Regulation emphasizes that pharmacy services must be available 24/7 to ensure medication availability for patients. HoREX Baucau needs to establish a shift system and adequate staffing to ensure medication distribution can be carried out at all times according to patient needs. The unit dose dispensing system, recommended as the safest distribution system, has not yet been implemented in HoREX Baucau. The unit dose system offers several advantages: reducing medication errors, facilitating monitoring of patient medication use, reducing medication waste, and improving patient safety. Although implementing this system requires a significant initial investment, the long-term benefits are significant.

Improvements needed in distribution include: First, implementing an integrated pharmacy management information system for real-time stock monitoring. Second, improving drug storage facilities and infrastructure in service units to meet pharmaceutical requirements. Third, adequate human resource management with a shift system to ensure 24-hour service. Fourth, implementing a consistent system for labeling and segregating high-alert and LASA medications. Fifth, a gradual development towards a unit dose system to improve patient safety.

CONCLUSIONS AND SUGGESTIONS

CONCLUSION

Based on the research results and discussion regarding the evaluation of the pharmaceutical service system based on Regulation of the Minister of Health of the Republic of Indonesia Number 72 of 2016 at the Eduardo Ximenes Regional Hospital in Baucau, Timor-Leste, the following conclusions can be drawn:

a. Evaluation of Pharmaceutical Service Planning Implementation
b. The implementation of pharmaceutical service planning at the Eduardo Ximenes Regional Hospital (HoREX) Baucau does not fully comply with the standards stipulated in the Indonesian Minister of Health Regulation No. 72 of 2016. Although periodic planning is conducted every three months using the consumption method based on previous period usage data, several significant gaps remain, namely:
c. a. The absence of an officially established hospital formulary as a basis for drug selection and planning. The formulary is a crucial instrument that should be developed by the Pharmacy and Therapeutics Team, considering drug effectiveness, safety, quality, and price.
d. b. Planning has not yet integrated the consumption method with comprehensive epidemiological data and disease patterns. The Minister of Health Regulation emphasizes the importance of a combination of methods to produce more accurate planning and anticipate changing needs.
e. c. The role of the Pharmacy and Therapeutics Committee/Team in providing input to the planning process has not been optimal. The Pharmacy and Therapeutics Team should actively provide evidence-based recommendations for drug selection and evaluation.
f. d. The manual and unintegrated drug usage data recording and reporting system makes it difficult to analyze data for planning the next period.
g. e. The lack of a standard and comprehensive Standard Operating Procedure (SOP) for the drug needs planning process.
h. This gap in planning directly impacts drug availability, which only reaches 75-85%, far below the established drug availability indicator standard of 95%. This situation indicates that inaccurate planning is a major factor in drug stockouts, particularly for essential drugs such as antibiotics, antihypertensives, antidiabetics, and drugs for chronic diseases.
i. 2. Evaluation of Pharmaceutical Service Procurement Implementation
j. The implementation of pharmaceutical service procurement at the Eduardo Ximenes Regional Hospital (HoREX) Baucau does not meet the standards stipulated in the Indonesian Minister of Health Regulation No. 72 of 2016, particularly in terms of time efficiency and receipt procedures. Several identified non-conformities are:
k. a. The procurement process is too long, taking 3-6 months from the planning stage to the receipt of drugs at the hospital. This process takes far longer than the ideal waiting time and often results in drug stockouts. The Minister of Health's regulation emphasizes that procurement must be effective and timely to ensure drug availability.
l. The drug receipt process does not meet standards. Quality inspections of received drugs are still limited to the physical aspects of packaging and expiration dates, and do not include detailed technical specifications. This is despite the Minister of Health's Regulations mandating that receipts must ensure that the type, specifications, quantity, quality, delivery time, and price match the physical condition received.
m. Documentation of received goods is not properly and systematically stored. The Minister of Health's Regulations emphasize

that all documents related to receipts must be properly stored for audit, tracking, and evaluation purposes.

n. Limited trained human resources and adequate quality testing equipment to conduct technical specifications checks on received drugs.
o. Suboptimal coordination with suppliers, resulting in delivery delays and sometimes discrepancies between the specifications of ordered drugs and the goods received.
p. The procurement system remains centralized at the Ministry of Health, with lengthy bureaucratic processes, exacerbated by a reliance on imports for certain drugs, which are time-consuming and expensive.
q. These limitations in the procurement process significantly disrupt drug availability in hospitals, ultimately impacting the quality of healthcare services to patients and reducing public trust in hospital pharmacy services.Evaluasi Pelaksanaan Pendistribusian Pelayanan Kefarmasian

The distribution of pharmaceutical services at the Eduardo Ximenes Regional Hospital (HoREX) in Baucau is partially in accordance with the standards stipulated in the Indonesian Minister of Health Regulation No. 72 of 2016, but still requires significant improvement. The distribution system implemented combines a complete floor stock system for emergency medications and an individual prescription system for outpatients and inpatients, which is one of the distribution system options recommended by the Minister of Health Regulation. However, its implementation faces several obstacles:

a. The manual distribution recording system makes it difficult to monitor and control stock in service units. The Minister of Health Regulation emphasizes the importance of a sound management information system to support effective distribution supervision and control.

b. Drug storage in service units does not meet pharmaceutical requirements. The Minister of Health Regulation stipulates that storage must ensure quality and safety, in accordance with requirements for stability, sanitation, light, humidity, and ventilation. Substandard storage conditions risk degradation of drug quality.

c. The lack of consistent implementation of a special labeling and separation system for high-alert medications and LASA (Look-Alike, Sound-Alike) medications increases the risk of medication errors.

d. Limited human resources for distribution, especially outside of working hours, impact the timeliness of medication distribution to service units and the continuity of 24-hour pharmacy services.

e. The lack of an effective stock control mechanism in service units leads to distribution imbalances, with some units experiencing stockpiles while others experience shortages.

f. The unit dose dispensing system, considered the safest and most efficient distribution system according to international standards for improving patient safety and reducing medication errors, has not been implemented.

This gap in the distribution system impacts the efficiency of medication use, the timeliness of service delivery, and most crucially, patient safety. Suboptimal distribution and substandard storage can increase the risk of medication errors and reduce the quality of medications received by patients.

SUGGESTIONS

Based on the conclusions above, the researcher can provide the following suggestions, both practical and for academics: Based on the conclusions of the research results, several suggestions can be recommended for improving the pharmaceutical service system at the Eduardo Ximenes Regional Hospital in Baucau, Timor-Leste, as follows:

1. SUGGESTIONS FOR IMPROVING THE PHARMACEUTICAL SERVICE PLANNING SYSTEM

a. Develop and establish an official Hospital Formulary, developed by the Pharmacy and Therapeutics Team, involving various disciplines (doctors from various specialties, pharmacists, nurses, and other healthcare professionals). The formulary must consider criteria for effectiveness, safety, quality, price, and drug availability. The formulary needs to be reviewed and revised periodically (at least every 2 years) to adapt to scientific developments and service needs.

b. Develop an integrated planning system that combines consumption methods with epidemiological methods. Planning should consider previous period usage data, disease patterns, epidemiological trends, priority health programs, remaining inventory, order lead times, and available budget. The ABC-VEN analysis can be applied to prioritize medications that must be consistently available.

c. Develop a comprehensive Standard Operating Procedure (SOP) for the entire drug requirements planning process. The SOP should include: the planning schedule, methods used, document formats, involved parties, approval mechanisms, and evaluation. The SOP should be disseminated to all relevant staff, and implementation monitored periodically.

d. Implement a computerized pharmacy management information system to facilitate accurate and real-time data collection, processing, analysis, and reporting. This system must be integrated with other service units in the hospital to facilitate coordination and data-driven decision-making.

e. Revitalize and strengthen the role of the Pharmacy and Therapeutics Team by establishing a clear organizational structure, granting adequate authority, scheduling regular meetings at least monthly, ongoing training for team members, and developing a measurable annual

work program. The Pharmacy and Therapeutics Team must be active in evaluating drug use, developing clinical pathways, and providing recommendations based on evidence-based medicine.
f. Improve human resource capacity through training on drug needs planning, data analysis, and pharmaceutical logistics management. Training can be carried out in collaboration with educational institutions or other hospitals that already have effective planning systems.

2. RECOMMENDATIONS FOR IMPROVING THE PHARMACEUTICAL SERVICES PROCUREMENT SYSTEM

a. Strengthen coordination with the Timor-Leste Ministry of Health to expedite the centralized procurement process. It is necessary to examine the possibility of granting partial authority to hospitals to procure certain urgent or specific medications, while still adhering to government procurement regulations. An early warning system needs to be developed to identify potential stockouts early.
b. Increase human resource capacity in drug quality inspection through: training on good receiving practices, certification for receiving officers, and training on identifying counterfeit and substandard drugs. A dedicated officer with adequate competency should be appointed to be responsible for drug receipt inspections.
c. Procure adequate quality testing equipment for checking drug technical specifications, including at least: analytical balances, temperature and humidity meters, UV lamps for specific drug inspections, and other supporting equipment. For more complex inspections, collaboration with accredited laboratories is recommended.
d. Develop a standardized and integrated documentation system for all stages of procurement. Documentation should include: planning documents, purchase orders, invoices, receipts, supplier certificates of analysis, quality inspection records, and non-conformance reports, if any. All documents must be stored systematically and easily traceable for audit purposes.
e. Develop a mechanism for periodically evaluating and monitoring supplier performance with clear indicators such as: on-time delivery, conformity to product specifications, completeness of documentation, and responsiveness to complaints. Evaluation results are used as the basis for selecting suppliers for the next procurement period. A reliable supplier database needs to be developed and maintained.
f. Establish a buffer stock for essential and life-saving drugs to anticipate procurement delays. The buffer stock must be carefully calculated to prevent drug expiration, taking into account procurement lead times, consumption variability, and the drug's shelf life.
g. Develop a comprehensive procurement SOP covering: supplier selection, ordering, order monitoring, goods receipt, quality inspection, non-conformance handling, payment, and reporting. The SOP must be socialized and implemented consistently.

3. RECOMMENDATIONS FOR IMPROVING THE PHARMACEUTICAL SERVICE DISTRIBUTION SYSTEM

a. Implement an integrated pharmaceutical management information system for real-time stock monitoring across all service units. The system must include the following features: electronic distribution recording, minimum and maximum stock alerts, drug movement tracking, automated reports, and a monitoring dashboard. The system can be started with open source software tailored to the hospital's needs.
b. Improvements to drug storage infrastructure in service units to meet pharmaceutical requirements include: renovating or constructing adequate storage space, procuring dedicated drug refrigerators with 24-hour temperature monitoring, installing air conditioning to maintain room temperature, providing standard storage racks, and providing a good lighting system. Each storage area must be equipped with a thermohygrometer to monitor temperature and humidity. Adequate human resource management with a shift system ensures 24/7 pharmaceutical services. Calculating human resource needs based on workload, taking into account: the number of beds, the number of prescriptions per day, service complexity, and operating hours. Recruitment of additional personnel is necessary if there is a gap between needs and availability. Implement a consistent system for marking and separating high-alert and LASA medications across all storage areas. High-alert medications should be labeled with a prominent color (e.g., red) and stored in a separate area with limited access. LASA medications should have tall man lettering on their labels and not be placed close together. A list of high-alert and LASA medications should be established and socialized to all staff. Gradual development towards a unit dose dispensing system to improve patient safety. Implementation can begin in intensive care units or units with a high risk of medication errors, then gradually expanded to other units. The unit dose system requires investment in infrastructure, technology, and human resource training, but provides long-term benefits in improving patient safety and efficiency. The preparation of a comprehensive distribution SOP includes: distribution schedules to service units, drug request procedures from units, dispensing procedures, documentation systems, emergency medication handling, and stock control mechanisms in the unit. SOPs must be socialized to all pharmacy staff and staff in service units, and implementation must be monitored periodically.Implementasi sistem FIFO (First In First Out) dan FEFO (First Expired First Out) secara konsisten dalam penyimpanan dan distribusi untuk mencegah obat kadaluarsa. Perlu dilakukan stock opname secara berkala (minimal setiap bulan) untuk monitoring stok dan identifikasi obat yang mendekati kadaluarsa, slow moving, atau dead stock.

4. RECOMMENDATIONS FOR MANAGEMENT POLICY AT EDUARDO XIMENES BAUCAU REGIONAL HOSPITAL

a. Establish a hospital policy on pharmaceutical service standards that adheres to international best practices, including adopting or adapting Indonesian Minister of Health Regulation No. 72 of 2016. The policy must cover all aspects of pharmaceutical services: pharmaceutical preparation management (selection, planning, procurement, receipt, storage, distribution, control) and clinical pharmacy services.
b. Allocate an adequate budget for the development of the pharmaceutical service system, including for: investment in information technology, procurement of infrastructure and equipment, training and development of human resources, and operation of the Pharmacy Installation. The budget for drugs and pharmaceutical supplies must be calculated realistically based on service needs.
c. Establish and empower an effective Pharmacy and Therapeutics Committee/Team with a clear organizational structure, specific job descriptions, and adequate authority. The Committee/Team must receive full support from hospital management in carrying out its functions to improve rational drug use and cost efficiency.
d. Develop a monitoring and evaluation system for the performance of the Pharmacy Installation with measurable indicators, including: percentage of drug availability, prescription waiting time, dispensing accuracy, number of medication errors, percentage of expired drugs, and service user satisfaction. Monitoring and evaluation results should be used as a basis for continuous improvement.
e. Facilitate collaboration with other hospitals, educational institutions, or professional organizations for benchmarking, knowledge sharing, and capacity building. Collaboration can include: comparative studies, staff internships, joint training, and technical consultations.
f. Plan and implement hospital accreditation using recognized international standards. Preparation for accreditation will encourage systematic improvements in all aspects of service, including pharmaceutical services. Accreditation also increases the credibility and public trust in the hospital.

5. RECOMMENDATIONS FOR POLICY FROM THE MINISTRY OF HEALTH OF TIMOR-LESTE

Develop national regulations on comprehensive standards for pharmacy services in hospitals. Regulations can adopt or adapt international best practices, including Indonesian Minister of Health Regulation No. 72 of 2016, with adjustments to the local context of Timor-Leste. Regulations should include: minimum standards for pharmaceutical human resources, infrastructure and equipment standards, drug management process standards, and clinical pharmacy service standards.
a. Allocate an adequate state budget for health system development, specifically for: the development of health information technology infrastructure, including pharmacy management information systems, procurement of equipment and facilities for hospital pharmacy installations, and programs to improve the competency of health human resources.
b. Establish a national body or committee responsible for the accreditation and supervision of pharmaceutical services in all health facilities. This body is tasked with: developing accreditation standards, assessing and certifying health facilities, providing technical guidance and coaching, and conducting regular monitoring and evaluation.
c. Develop ongoing training and certification programs for pharmacists and pharmacy technicians throughout Timor-Leste. This program can collaborate with pharmaceutical higher education institutions, professional organizations, or international institutions. Training topics should cover technical aspects of pharmacy, management, patient safety, and the latest developments in pharmaceutical care.
d. Improve the national drug procurement system to increase efficiency and effectiveness. Improvements could include: simplifying bureaucratic procedures without compromising accountability, developing an e-procurement system, granting hospitals greater authority for certain procurements with strict oversight mechanisms, and developing a more responsive distribution system.
e. Develop a national drug quality assurance system that includes: strict drug registration and licensing regulations, an inspection system for drug production and distribution facilities, post-market surveillance of drugs in circulation, and handling of counterfeit and substandard drugs. An institution equivalent to the Food and Drug Monitoring Agency (BPOM) for regulatory and oversight functions should be established or strengthened.
f. Facilitate regional and international cooperation in the pharmaceutical sector, including with ASEAN countries, the WHO, and other international organizations. Collaboration could include: technical assistance, capacity building, sharing best practices, and harmonization of standards.

6. RECOMMENDATIONS FOR FURTHER RESEARCH

a. Conduct comparative research in several hospitals across Timor-Leste to obtain a comprehensive picture of the state of national pharmaceutical services. This research can identify common patterns of problems and best practices that can be disseminated.
b. Conduct quantitative research to measure the impact of implementing recommendations on pharmaceutical service performance indicators such as drug availability, waiting times, medication errors, patient satisfaction, and cost efficiency. This research can use a quasi-experimental design or time series analysis.
c. Conduct cost-effectiveness or cost-benefit analysis studies for investments in information technology and pharmaceutical service infrastructure. This study is important to provide economic justification for decision-makers in budget allocation.

d. Conduct research on patient perspectives and satisfaction with hospital pharmacy services. This research can use survey methods or focus group discussions to obtain direct input from service users.
e. Conduct longitudinal research to monitor the development and impact of improvements to the pharmaceutical service system over time. This research can evaluate the sustainability of interventions and identify factors influencing successful implementation.
f. Conduct research on medication errors in hospitals to identify the types, frequency, causes, and impact of medication errors. The results of this research can form the basis for developing effective prevention strategies.
g. Conduct research on the rationality of medication use in hospitals using methods such as DU90% (Drug Utilization 90%), Defined Daily Dose (DDD), or other WHO-recommended methods. This research is essential for identifying patterns of irrational drug use and developing appropriate interventions.
Implementing the above recommendations requires a strong commitment from all stakeholders, including hospital management, the Pharmacy Unit, medical and paramedical staff, and the Timor-Leste Ministry of Health. Improving the pharmaceutical care system is an ongoing process that requires patience, perseverance, and continuous evaluation. With systematic and planned improvements, it is hoped that HoREX Baucau can become a model hospital with high-quality, safe, effective, and efficient pharmaceutical services, which will ultimately improve the quality of healthcare services for the people of Timor-Leste.

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