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ANALYSIS OF DRUG PLANNING USING THE CONSUMPTION METHOD IN THE PHARMACY INSTALLATION OF FATIMAH ISLAMIC HOSPITAL, CILACAP

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ABSTRACT

Background: This study highlights the importance of effective drug management to ensure the availability of safe, high-quality medicines. Ineffective inventory planning may lead to shortages or excess stock, both of which can cause harm. **Objective**: This study aims to analyze drug planning using the consumption method to improve stock management efficiency. **Methods**: Data were collected through surveys and analysis of hospital drug consumption patterns. This study emphasizes the integration of pharmaceutical services with drug logistics management as a strategy to enhance the overall quality of health services. **Results**: Of the 100 drug samples analyzed, 83 required procurement, while 17 did not due to adequate availability. The most frequently consumed drug was acetylcysteine cap 200 mg, with a total usage of 20,607 tablets. **Conclusions**: Fatimah Islamic Hospital in Cilacap applies the consumption method by considering previous usage data, remaining stock, safety stock, and lead time.

ABSTRAK

Latar belakang: Penelitian ini didasari pentingnya pengelolaan obat yang efektif untuk menjamin ketersediaan obat yang aman dan berkualitas. Kesalahan dalam menentukan jumlah persediaan obat dapat mengakibatkan kekurangan atau kelebihan stok, yang berpotensi merugikan. **Tujuan:** Penelitian ini bertujuan menganalisis perencanaan obat dengan metode konsumsi yang dapat membantu dalam pengelolaan stok obat secara lebih efisien. **Metode:** Metode yang digunakan dalam penelitian ini meliputi pengumpulan data melalui survei dan analisis terhadap pola konsumsi obat di rumah sakit. Penelitian ini juga menekankan pentingnya integrasi antara pelayanan kefarmasian dan manajemen logistik obat, yang bertujuan meningkatkan kualitas pelayanan kesehatan. **Hasil:** Seratus sampel obat yang dianalisis, sebanyak 83 obat perlu dilakukan pengadaan dan 17 obat tidak perlu dilakukan karena stok masih mencukupi. Pemakaian terbanyak yaitu asetilsistein cap 200 mg sebanyak 20.607 tablet. **Simpulan:** perencanaan obat di Rumah Sakit Islam Fatimah Cilacap menggunakan metode konsumsi yang mempertimbangkan data pemakaian obat periode sebelumnya, sisa stok, *safety stok*, dan *lead time*.

INTRODUCTION

Pharmaceutical services are directly provided to patients. These services focus not only on providing medication but also emphasize the safety and effectiveness of therapy. Furthermore, pharmaceutical services aim to improve patient understanding of the rational use of medications in accordance with expected quality standards. The availability of adequate equipment and materials to support healthcare services plays a crucial role in ensuring the quality of healthcare services for the community (Kusumawardhana et al., 2024).

Hospital medication management is a crucial component of the overall hospital management function, and inefficiency will negatively impacts the hospital's medical and economic performance. The goal of hospital pharmacy management is to ensure that necessary medications are available when needed in sufficient quantities, of guaranteed quality, and at affordable prices to support quality service. This primary function builds on the previous one and determines the subsequent ones. The service process and drug logistics management are inseparable, as both are patient-oriented, providing quality, and affordable drug logistics for the community. The purpose of these two activities is to prevent, identify, and resolve drug-related problems (Arifin et al., 2023).

Research conducted by Mumek et al. (2016) at Prof. Dr. R. D. Kandou General Hospital in Manado experienced shortages/stockouts of cardiovascular and anesthetic drugs, including nicardipine. Prof. Dr. R. D. Kandou General Hospital in Manado also experienced excess inventory of lidocaine injection 2% and lisinopril 10 mg. Research by Arifin et al. (2023) conducted at Hospital X, a National Health Insurance (JKN) program, also experienced drug shortages or stockouts due to inefficient hospital service management, particularly in the pharmacy department. A study conducted by Agustini et al. (2020) using the consumption method at Bandung Regency Hospital showed that out of 88 drug samples, the drug procurement compliance results in October, November, and December 2017 were 56.82%, 54.55%, and 80.68%, respectively. A study conducted by Murtafi'ah et al. (2016) using the consumption method showed that 166 items were procured and 48 items were not. The Buffer stock usage was 30% with a lead time of 7 days. The highest average usage was found in RL with 16,321 plates. Comparison with the planning at Tidar Hospital, Magelang City, showed that 61% of procurement was in accordance with the plan, while 39% was not in accordance with the plan, according to the study results. Excessive drug stock has the potential to pose various risks, such as physical damage to the drug and its expiration before it is used, which can ultimately result in losses for healthcare facilities (Rahmawatie and Santosa, 2015). Errors in determining drug inventory levels can also lead to an imbalance between demand and availability, resulting in an inability to meet patient demand or excess stock, which requires additional storage space and increases operational costs. Therefore, effective and efficient medication management is a crucial aspect of pharmaceutical services to ensure

patient safety and the sustainability of healthcare services (Setiyawati and Umilia, 2022). This management must be supported by a structured and sustainable inventory planning, evaluation, and control system. Drug shortages in healthcare facilities are generally caused by inaccurate planning, not solely by constraints in the procurement process (Oktaviani et al., 2022). Therefore, thorough, data-driven inventory planning is essential to prevent drug shortages and excesses, ensuring optimal patient care (Fatimah et al., 2022).

Proper drug planning and procurement are key factors in ensuring drug availability according to healthcare needs. Efficient and integrated drug management plays a crucial role in preventing both overstocking and understocking. Drug shortages can be prevented by implementing accountable methods based on predetermined planning (Laukati et al., 2022). Several methods can be used, including consumption, epidemiology, and a combination of both (Tie et al., 2019). The consumption method is the simplest planning method, illustrated by projecting drug availability based on drug consumption in the previous year (Prasaja et al., 2024).

Based on a preliminary survey conducted by informants at the Fatimah Islamic Hospital in Cilacap, there are still many stockouts or drug shortages for several types of drugs needed by patients. Based on the above background, the researcher is interested in conducting research on drug planning analysis using the consumption method at the Pharmacy Installation of the Fatimah Islamic Hospital in Cilacap.

METHOD

This study used a quantitative descriptive design with retrospective data collection. Data were obtained from initial and final drug stock reports, average usage, buffer stock reports, lead time reports, 2025 Drug Requirement Plan (RKO) data, and drug item data at the Pharmacy Unit of Fatimah Islamic Hospital, Cilacap. The study population consisted of all drug planning items at the Pharmacy Unit of Fatimah Islamic Hospital, Cilacap. The sample was determined using the Slovin formula, with a population size (N) of 1,215 drug items and a margin of error (e) of 0.1. Based on the calculation, the n value was 92.39, so the sample size was rounded to 100 drug items used in the study. The inclusion criteria included remaining drug stock reports for the December 2024 period, drug buffer stock reports, one-year average usage reports, lead time reports, and 2025 RKO data. Data meeting these criteria were used as the basis for drug planning analysis.

This study has two variables: the independent variable, drug planning, and the dependent variable, the consumption method used in the drug needs analysis. The research instruments included remaining drug stock reports, drug safety stock reports, average usage reports, lead time reports, hospital formularies, drug item data, and 2025 RKO data. All of these instruments were used to obtain a comprehensive overview of drug planning.

The study began with a preliminary survey letter submitted to Fatimah Islamic Hospital, Cilacap. After obtaining approval, data was collected including drug name, order quantity, average usage, remaining stock, safety stock, annual drug consumption, and the number of stockouts for each drug item. These data was used to calculate lead time, safety stock, and drug requirements for one year. The results were then processed and analyzed, and compared with the 2025 RKO data at Fatimah Islamic Hospital, Cilacap. The research phase concluded with the preparation of a research report based on the findings.

Data processing was performed in three stages. First, editing, which examined secondary data from the 2024 drug planning period. Second, data entry, which entered the data into the computer for processing. Third, tabulation, which presented the research data in tables according to predetermined criteria for subsequent analysis. Data analysis was performed by calculating average usage, safety stock, and lead time to obtain the total drug requirements for one year. The results of the drug requirement calculations were then compared with the 2025 RKO data at the Fatimah Islamic Hospital in Cilacap, and analyzed descriptively in accordance with the research objectives.

RESULT

Table 1. Most Common Drug Uses

Drug Name	Unit	Amount
Acetylcysteine Cap 200 mg	CAP	20,607
Calplex Tab	TAB	18,243
Spironolactone Tablets 25 mg	TAB	16,096
Isosorbide Dinitrate Tablets 5 mg	TAB	11,941
Dexamethasone Inj 5 mg/ ml @ 1 ml	AMP	10,773
Dextamine Tablets	TAB	10,460
Cefadroxil Cap 500 Mg	CAP	9,096
Ambroxol Tablets 30 mg	TAB	8,030
CTM Tab 4 mg	TAB	7,191
Domperidone Tablet 10 Mg	TAB	6,534

Based on the table above, the highest usage value is for acetylcysteine 200 mg Cap, with 20,607 tablets. Drugs with the highest usage rates must be ensured to always have stock available to meet patient needs. Monitoring of medications with the highest usage rates must be done to prevent stockouts. There are 10 diseases most frequently experienced by patients, both in inpatient and outpatient settings. Identifying these most common diseases aims to understand the dominant morbidity patterns in the hospital, thus providing a reference for more precise and efficient drug needs planning. The following are the top 10 diseases in the Pharmacy Unit of Fatimah Islamic Hospital, Cilacap:

Table 2. Diseases The most in the Inpatient Pharmacy Installation of the Fatimah Islamic Hospital, Cilacap

Disease-Causing Groups	Number of Patients Discharged Alive	Number of Patients Discharged Dead	Total Number
Typhoid fever	4,313	36	4,349
Dengue fever (classical dengue)	1,040	5	1,045
Gastroenteritis and colitis of unspecified origin	513	2	515
singleton, born in hospital	494	0	494
Acute upper respiratory infection, unspecified	400	1	401
Second degree perineal laceration during delivery	401	0	401
Fetus and newborn affected by caesarean delivery	370	0	370
Premature rupture of membranes, onset of labor within 24 hours	359	0	359
Hypertensive renal disease with renal failure	280	22	302
Bacterial infection, unspecified	289	3	292

Table 3. Disease the most in the Pharmacy Installation of the Fatimah Islamic Hospital, Cilacap Outpatient

Disease-Causing Groups	Number of Patients Discharged Alive	Number of Patients Discharged Dead	Total Number
Other physical therapy	11,547	0	11,547
Extracorporeal dialysis	5,960	0	5,960
Attention to surgical dressings and sutures	3,204	0	3,204
Acute upper respiratory infection, unspecified	2,570	0	2,570
Cataract, unspecified	2,502	0	2,502
Supervision of high-risk pregnancies, unspecified	2,456	0	2,456
Fever, unspecified	2,231	0	2,231
Non-insulin-dependent diabetes mellitus: with neurological complications	2,055	0	2,055
Other and unspecified abnormal pain	2,034	0	2,034
Necrosis of pulp	1,999	0	1,999

Based on Tables 2 and 3, the most common illness was other physical therapy, while the most commonly used medication is acetylcysteine. This indicates a mismatch between disease patterns and medication use, which is influenced by the use of random sampling. Another factor that plays a role in planning is remaining stock, as it is used to

determine the quantity of medication needed for the following period. The data shows that six medications are out of stock, one of which is Galvus Tablet 50 mg, which has the potential to disrupt service delivery. Conversely, the largest remaining stock is for Glimepiride Tablet 1 mg, with 32,499 tablets, which poses a risk of overstocking and expiration.

Fatimah Islamic Hospital in Cilacap has an average lead time of 14 days, calculated from the time the purchase order is issued to financial approval. This lag prevents orders from being fulfilled immediately. Drug requirement planning in this study used the consumption method, considering several key components: average drug usage, lead time, safety stock, and remaining stock. Safety stock is calculated first, then drug requirements are determined using the formula: average usage × duration of need + safety stock - remaining stock.

Table 4. Total Planning Drug Procurement

Number Held	Amount Not Held	Total
83	17	100

The research conducted revealed the number of drug plans that should and should not be procured, as listed in Table 4. From the table the can seen overall from all sample there are 17 drugs No need held Because stock Still Enough For need drug period Next , here is a list of drugs that are not need held :

Table 5. Unnecessary Medications Held

Drug Name	Unit	Remaining Stock	Average usage = (1 year usage / 12 months)	Safety Stock = (lead time / number of days per month X average)	Planning Quantity = (Average X 12 + Safety Stock - Remaining Stock
Glimepiride	TAB	32,499	67	31	-31,664
Isosorbide Dinitrate Tablets5 mg	TAB	19,287	995	464	-6,883
Antacid Doen Tab	TAB	11,893	509	238	-5,547
Domperidone Tablet 10 mg	TAB	10,727	545	254	-3,933
INH [Isoniazid] 300 mg	TAB	1,992	44	21	-1,443
Rifampicin Tablets 450 mg	TAB	1,178	26	12	-854

Ambroxol Tablets 30 mg	TAB	9,157	669	312	-817
Herbesser CD® Cap 200 mg	STAMP	659	25	12	347
Dipasolon Tablet 4 mg	TAB	340	2	1	-315
Maxstan Tab 500 mg	TAB	296	13	6	-134

Based on the table, the procurement of medicines has not yet been completed because the remaining stock is still large. One of the unused drugs that can be procured is Glimepiride Tab 1 mg. This drug has not yet been procured because the stock remains sufficient. If procurement is performed, there is a risk of overstocking and potential expiration. Procurement must be done against 83 drugs because many are used and the remainder stock is not allowed for the period afterward. The following are the 10 drugs of 83 that require procurement:

Table 6. List of Drugs Required Procurement

Drug Name	Remaining Stock	Average usage = (1 year usage / 12 months)	Safety Stock = (*lead time* / number of days per month X average)	Planning Quantity = (Average X 12 + Safety Stock - Remaining Stock)
Acetylcysteine Cap 200 mg	3,511	1,717	801	17,894
Calplex Tab	1,341	1,520	709	17,608
Dexamethasone Inj 5 mg/ ml @ 1 ml	807	898	419	10,388
Dextamine Tablets	1,694	872	407	9,177
Spironolactone Tablets 25 mg	8,801	1,341	626	7,917
Tranexamic Acid Inj 500 Mg [100 mg/ ml @ 5 ml]	449	533	249	6,196
Cefadroxil Cap 500 mg	3,856	758	354	5,594
Farbivent Inj @ 2.5 ml	50	416	194	5.136
Mecobalamin Cap 500 mg	1,315	434	203	4,096
Norestil Tablet 5 mg	58	261	122	3,196

Table 6 shows that medicines must be procured because, if no procurement is not done, then drugs will experience empty stock, which causes disturbance in the pharmacy service at Fatimah Islamic Hospital, Cilacap. Drugs that require procurement the biggest that is acetylcysteine Cap 200 mg as many as 26,705 drugs.

The data was analyzed by comparing the 2025 RKO with procurement calculations for that period. The differences between the 2025 RKO and procurement calculations is shown in Table 7.

Table 7. Comparison of RKO with drug planning calculations

No	Drug Name	Unit	2025 Budget Plan	Planning	Difference
1	Isosorbide Dinitrate Tablets 5 mg	TAB	85,380	-6,883	92,263
2	NaCl 0.9% Inf @ 500 ml	FLB	62,610	2,211	60,399
3	Spironolactone Tablets 25 mg	TAB	61,815	7,917	53,898
4	Sodium Bicarbonate Cap 500 mg	CAP	38,100	1,829	36,271
5	Glimepiride Tablet 1 mg	TAB	4,215	-31,664	35,879
6	Acetylcysteine Cap 200 mg	CAP	48,210	17,894	30,316
7	Domperidone Tablet 10 Mg	TAB	22,785	-3,933	26,718
8	Bisoprolol Tablets 5 mg	TAB	23,715	133	23,582
9	Antacid Doen Tab	TAB	10,185	-5,547	15,732
10	CTM Tab 4 mjug	TAB	17,475	2,426	15,049
11	Calplex Tab	TAB	0	17,608	-17,608
12	Dextamine Tablets	TAB	0	9,177	-9,177
13	Farbivent Inj @ 2.5 ml	AMP	0	5.136	-5.136
14	Mecobalamin Cap 500 mg	CAP	0	4,096	-4,096
15	Norestil Tab 5 mg	TAB	0	3,196	-3.196
16	Glutrop Tab	TAB	0	2,558	-2,558
17	Papaverine Tablets 40 mg	TAB	0	2,442	-2,442
18	Glauseta Tab 250 mg	TAB	0	2,412	-2,412
19	Patral Kapl	KAPL	0	2,347	-2,347
20	Diagit Tab	TAB	0	2,061	-2,061

DISCUSSION

Pharmaceutical supply requirements can be calculated using the consumption method, which is based on an analysis of previous periods' pharmaceutical supply consumption data through adjustments and corrections. The steps used to calculate pharmaceutical requirements are based on future needs, taking into account lead times and safety stock (Agustini et al., 2020).

This study was conducted in March 2025 at the Pharmacy Unit of Fatimah Islamic Hospital, Cilacap. Drug planning at the Pharmacy Unit of Fatimah Islamic Hospital, Cilacap, used the consumption method, conducted by the Warehouse Manager, assisted by two Pharmacy Vocational Staff, and approved by the Head of the Pharmacy Unit. The 2024 budget was prepared annually, but planning was conducted monthly. The data used

in this study was primary data, including drug usage data for one year and remaining stock as of December 2024.

The list of drugs used showed 1,215 types of drugs listed. Of these, this study took a sample of 100 drugs for further analysis. The data used in this study is primary data obtained from general drug use reports for the period January to December 2024. Based on these reports, the data analyzed included monthly drug use for each type of medication. Sampling was conducted with a 10% accuracy limit to obtain representative results, resulting in a sample size of 100 drugs.

Determining drug needs using the consumption method is carried out by considering various important aspects of drug planning in hospitals. These aspects include drug use data from the previous period, budget availability, and drug standardization listed in the formulary. Furthermore, planning also included warehouse capacity and ending stock levels, procurement lead times, and the determination of safety stock. Other factors considered the number of patient visits, dominant disease patterns, and the application of applicable therapeutic standards (Agustini et al., 2020).

One factor in drug planning using the consumption method is the drug use in the previous period. The previous period's usage represents the amount of medication needed in the preceding period. This data is important in planning because the data can be detailed precisely and used as a reference.

Based on Table 7, there are differences between the 2025 RKO and the results of the calculation of procurement drugs. For example, Isosorbide Dinitrate Tab 5 mg has difference of 92,263, so that according to researchers No need procurement Because usage during One year only 11,941 tablets with stock of 19,287 tablets. Total over - procurement big can cause overstock, causing waste budget, as well as risk expired or damage (Wulandari & Sugiarto, 2019). On the other hand, Calplex Tab shows difference -17.608, so need procurement because usage a year reached 18,243 tablets while stock only 1,341 tablets. The number overbooking low can trigger stockout, namely condition when request drug No fulfilled. This condition pushes patients to buy medicine outside the House Sick and potentially lower income house (Wari and Mudayana, 2024).

Difference This influenced by differences method calculation. RKO for 2025 is calculated from prediction procurement year previously reduced remainder stock, while method consumption count need with formula : average usage × duration of need + safety stock – remaining stock (Saputra et al., 2024). This is what causes mismatch between RKO houses Sick with results calculation consumption.

CONCLUSION

Based on the results of the research on planning drug use method consumption at the Pharmacy Installation of the Fatimah Islamic Hospital in Cilacap can concluded that planning medicine at Fatimah Islamic Hospital Cilacap uses method consumption that takes into account usage data drug period previously , the remainder stock , safety

stock , and lead time . One hundred the samples analyzed , there were 83 drugs need done procurement and 17 drugs were not needed. The most commonly used drug was Acetylcysteine Cap 200 mg as many as 20,607 tablets.

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