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Analysis of Drug Management and Improvement Strategies Using the Hanlon Method in Pharmaceutical Installations RSUD Dr. Moewardi in 2022

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ABSTRACT

Drug management at RSUD Dr.Moewardi in previous research showed that drug management in the Pharmacy Installation at Dr. Moewardi is not yet efficient. Dr. Moewardi Hospital Pharmacy Installation which includes the selection, planning, procurement, distribution and use stages in 2022, determine priority drug management problems based on the Hanlon method and find out strategies for improving drug management in the RSUD Pharmacy Installation Dr.Moewardi in 2022. Secondary data was obtained from interviews with the Head of the Pharmacy Installation at RSUD Dr. Moewardi. The results of research on drug management at IFRSUD Dr. Moewardi who did not meet the standards at the selection stage for suitability of drug items available at Fornas (82.80%) and FRS (81.41%) at the procurement stage, percentage of drug procurement fund allocation (17.27%) Frequency of late payments (448X) percentage of suitability of drug planning(87.16%) at the distribution stage accuracy of drug quantity data on stock cards (95%) ITOR(15.078 times) percentage of expired drugs (0.04%), percentage of dead stock (13%) and at the usage stage the number of drug items per prescription sheet (3.6), the percentage of generic drug use (72.85%) and the average waiting time for compounded drugs was (61.76 minutes) and non-mixed (28.68 minutes)

INTRODUCTION

Drug management is one of the hospital management in the provision of overall health services, because inefficiencies and unsmooth drug management will have a negative impact on the hospital. Drug management includes four basic functions, namely selection, planning, and procurement. distribution and use that requires support from the planning and administration of organizational management, information management and human resource development contained therein (Quick et al, 2012).

The Hospital Pharmacy Installation (IFRS) is the only part of the hospital that is fully responsible for the management of pharmaceutical preparations and other health supplies, so that all drug circulation is under the control of the Pharmaceutical Installation in the Hospital. The wide role of pharmaceutical installations in the smooth running of health services and as the largest source of income in hospitals, the strategy of developing Hospital Pharmacy Installations needs to be carried out in the face of competition with other hospitals (Siregar and Amalia, 2003).

According to the results of previous research at Dr. Moewardi Hospital in 2020 (Imelia L, 2020) showed that drug management at the Pharmaceutical Installation of Dr. Moewardi Hospital was not efficient.

Based on previous research, this has become basic information that needs to be investigated in the management of medicines in hospitals and their management support so that problems and weaknesses in implementation can be identified and to overcome inefficiencies and non-smooth management which can have a negative impact on hospitals so that improvement efforts can be made. in order to improve health services to the community. The large impact of drug management encouraged the author to conduct research on drug management analysis and improvement strategies using the Hanlon method in the pharmacy installation of Dr. Moewardi Regional Hospital. The aim of this research is to analyze drug management at IFRSUD Dr. Moewardi which includes the selection, planning, procurement, distribution and use stages.

METHODS

This research design is a descriptive research design with data collection retrospectively and concurrently. Data is taken from data retrospectively in 2022. Research materials include documents on selection, planning, procurement, and use of drugs at IFRS Dr. Moewardi Hospital. Secondary data were obtained from interviews with the Head of Pharmaceutical Installation of RSUD Dr.Moewardi Surakarta, Head of planning and head of ULP (Procurement Service Unit).

RESULTS AND DISCUSSION

A. Selection

Measurement of the percentage of suitability of drugs available at IFRSUD Dr. Moewardi with items available in Fornas and Formulary RSUD Dr. Moewardi. The data taken are secondary data obtained retrospectively from the 2022 data can be seen in table 1.

Table 1. Conformity of Available Drug Items with Fornas and FRS

Information	Sum	Standard Value
% drug items available in Fornas	82,80%	100%
% drug items available in FRS	81,41%	80%

Based on the results of research in table 1, the drug selection stage at Dr. Moewardi's hospital pharmacy installation found that the drug items available at Fornas were 82.80%, while the standard value was 100%, where the drug items available at Fornas were not appropriate. And the drug items

available in the hospital formulary are 81.41% while the standard value is 80% where the drug items available in the hospital formulary are not appropriate. According to the results of the drug selection interview based on drug demand and disease patterns in Dr. Moewardi's hospital, in the hospital formulary there are several drug items outside Fornas, namely as many as 22 drug items.

B. Planning and Procurement

The medicinal product and quantity are determined according to plan, the supplier is

selected, and the order letter (SP) is written and sent to the supplier until (SP) is received. The expected effectiveness of the drug in accordance with the main objectives of the hospital must be taken into account in the early stages of planning and procurement.

1. Percentage of Drug Procurement Fund Allocation Available

Dr. Moewardi's IFRSUD drug purchase budget is measured as a percentage of the hospital's total drug procurement budget. This measurement seeks to ascertain the extent to which Dr. Moewardi's IFRSUD recommended budget for drug procurement exceeds the actual budget for existing drug procurement. Data taken retrospectively in 2022 can be seen in table 2

Table 2. Percentage of Drug Procurement Fund Allocation 2022

Information	Budget 2022	Standard Value
Drug Procurement Fund Allocation 2022	Rp219.357.554.591	
Total Budget of RSUD 2022	Rp1.269.634.538.807	30-40%
% IFRS Drug Procurement Fund Allocation	17,27%	

Based on the results of the research table 2 stages of planning and procurement on the percentage of allocation of available drug procurement funds is 17.27% where the standard value is 30-40% where this indicator is not in accordance with the standard so that the budget plan provided is still inefficient when compared to the standard value of 30-40% set by the Ministry of Health (Depkes RI, 2008). The drug budget in hospitals is still low because hospitals prioritize other needs to improve hospital facilities and infrastructure. According to research (Hariani et al, 2022). Explain that the disbursement of budget allocations in hospitals will generally not be in accordance with existing demand. This is because hospitals prioritize the construction of facilities and infrastructure and reducing the number of patients visiting hospitals can significantly disrupt existing income.

2. 2. The Frequency of Delayed Payments by the Hospital Against the Agreed Time

The indicator of the frequency of delayed payments by hospitals against the agreed time aims to determine the quality of payments from hospitals. The percentage of delayed payment time by the hospital shows the lack of good financial management of the hospital. This is by matching the payment due date with the payment date by the hospital. Data observed from invoice payment due dates and payment dates by hospitals were taken retrospectively in 2022.

Table 3. Frequency of Delayed Payment by RS Against the Agreed Time

Information	Frequency	Standard Value
Number of invoices observed due for payment by Dr. Moewardi Hospital in 2022	488x	0-25x

Based on the results of the study in table 3, the planning and procurement stage, the frequency of delayed payment by the Hospital at the agreed time is not in accordance with the standard value, where the delayed frequency is 448x and where the standard value is 0-25x. Based on interviews, the cause of the delay in payment to the agreed time is because the drugs or medical devices in one contract have not been fully creamed and there are problems with the administration that have not been completed, such as lack of paperwork. According to Research (Nugroho et al, 2020) the length of payment time is caused by the length of the process of filing payment CHDs to each partner or drug distributor and also due to late disbursement of BPJS funds to hospitals, while hospitals still use PNBP funds, namely income from BPJS claims and cash payments deposited to the State first and will be disbursed later using CHD, So it takes a long time for payments to each drug distributor. On research (Chotijah et al, 2020). The results of data analysis showed that the frequency of delayed payments by hospitals was 42 times. According to (Pudjaningsih, 1993) the frequency of delayed payments ranges from 1-25 times, so drug management on these indicators is not in accordance with standards.

3. The Percentage of Compatibility Between Drug Planning and Each Reality

The indicator of the conformity of planning with the reality of use for each drug item aims to determine how much the accuracy of drug selection in procurement. Data was taken retrospectively in 2022. The percentage of planning conformity with the reality of use for each drug item can be seen in table 4

Table 4. Percentage of Conformity Between Drug Planning and Individual Reality

Information	Sum	Standard Value
Drug items in planning	808	
Used medicinal items	927	100-120%
% of procurement conformity with the reality of use	87,16%	

Based on the results of research in table 4 stages of planning and procurement, the percentage of conformity between drug planning and their respective reality is not appropriate, where the suitability of procurement with the reality of use is 87.16%, where the standard value is 100-120%. This inaccuracy is caused by poor planning so that the use of drugs cannot be predicted. Based on interviews, the doctor's prescribing pattern changed or the number of doctors who asked for drugs outside the plan due to an increase in patients where Dr. Moewardi's hospital is a referral hospital whose drug prescribing fluctuates. According to research (Lisni et al, 2021). Explained related to procurement that was not in accordance with the plan in his research that there was a demand for drugs that had to be met and changes in disease patterns in that year.

C. Distribution

Medicines and pharmaceutical supplies are distributed to patients who need care, both inside and outside the hospital. All drug formulations distributed by IFRS must be delivered to the patient's care site in a manner that ensures the safety of the drug, the patient, the schedule, the date, time, mode

of administration, and the drug administration staff. Drugs are stored alphabetically, dosage type or form, and temperature or stability storage systems, with FIFO (First in First Out) and FEFO (First Expired First Out) to ensure freshness and potency. Stock taking is done at the end of each month and at the end of the year to determine the amount of inventory available at that point in time, which is then used as a starting point to estimate next year's needs. The results of observations made at the Dr. Moewardi Regional General Hospital Pharmacy Installation at the distribution stage are as follows:

1. Accuracy of Drug Quantity Data on Stock Card

The accuracy of warehouse officers will be measured by indicators of conformity between the physical quality of drugs and stock cards. Each drug has a stock card detailing the date, number of product receipts, number of items out, remaining stock, expiration date. This data collection was carried out at Dr. Moewardi Hospital Inpatient prospectively.

Table 5. Accuracy of Drug Quantity Data on Stock Card

Information	Sum	Standard Value
Appropriate card stock	38	
Card stock taken	40	100%
% drug match with card stock	95%	

Based on the results of the study in table 5 shows the results of the match between the data on the number of drugs carded in stock with the physical amount of drugs, which is 95%, the actual standard value is 100% (WHO, 1993). This means that administration in the warehouse has not been carried out optimally. Based on interviews, the reason for frequent incompatibility with physical drugs and stock cards is because hospitalization at Dr. Moewardi Hospital uses two driver's licenses, so there are often incompatibility between physical drugs and stock cards. According to research (Oviani & Indraswari, 2020). That the suitability of drugs with stock cards should be carried out properly and control them every day such as recording drugs that enter and leave is the job of the pharmacy officer so that no drugs are not recorded.

2. Inventory Turn Over Ratio (ITOR)

The evaluation of the researcher's inventory is done by calculating the Inventory Turnover Ratio (ITOR). Inventory efficiency is measured by the amount of Turn Over Ratio (TOR) value, which is the amount of fund turnover for each type of drug in a period. Data was taken retrospectively in 2022. ITOR is a comparison between COGS (cost of goods sold) in a year with the average value of inventory. The higher the ITOR value, the more efficient the drug management, but a low ITOR value indicates a buildup of drugs in the warehouse.

Table 6. Inventory Turn Over Ratio (ITOR)

Initial stock (Rp) A	8.680.489
1 year funding requirement (Rp) B	219.357.554.591
Final stock (Rp) C	11.735.206
HPP (Rp) (D=A+B-C)	219.354.499.874
Average value of inventory (Rp) (E=A+C/2)	14.548.092
TOR (river) (F=D/E)	15, 078

Based on the results of research in table 6 shows that the ITOR value is 15,078 times where the ITOR value is in accordance with the standard, which is 10-23 times (WHO, 1993). This can be interpreted that economically the amount of inventory value is efficient, which shows that Dr. Moewardi Hospital has good inventory control and economically the inventory is efficient so that it can make a profit.

3. Drug Availability Rate

The indicator of the level of drug availability in pharmaceutical installations aims to determine how much drug adequacy is needed by Dr. Moewardi's IFRSUD during a period of one year in each month. Data was collected retrospectively from a 2022 data search.

Table 7. Drug Availability Rates

Information	Sum	Standard Value
Total available drug items	4.311.782	
Average use of medicinal items a month	359.315,2	12-18 bulan
%drug availability rate	12 bulan	

Based on the results of research in table 7 shows that the level of drug availability at Dr. Moewardi Hospital is 12 months with standard values according to (Depkes RI, 2008). That is 12-18 months so it can be said to be efficient. Drug procurement funds are limited but the level of drug availability meets the standards because of the direct purchase system from the hospital to distributors of empty medicines to ensure the continuity of health services in hospitals.

4. Percentage of expired and damaged drug value

Expired drugs are drugs that have passed their service life or expiration period the purpose of evaluating expired drugs is to determine the amount of loss due to drugs. Inaccuracy in planning and lack of attention to storage quality, shifts in disease patterns, and variations in prescription patterns can all be reflected in the high proportion of expired drugs, the value of which must be calculated. Data taken retrospectively in 2022.

Table 8. Percentage of Expired Drug Value

Information	Sum	Standard Value
The value of expired drugs in 2022	188.914.984	
Stock taking value in 2022	55.476.693.281,10	0%
% expired drug value	0,04%	

Based on the results of research in table 8 shows that the percentage of expired drug value is 0.04%. According to (Satibi, 2017). The amount of the percentage value of expired drugs reflects inaccuracy in the planning process and poor observation of drug quality in the drug storage process The standard indicator of expired drugs is 0%. Based on the interview with the head of the hospital's pharmaceutical installation, Dr. Moewardi, there are several factors so that there are expired drugs where the hospital has one of them, namely grant drugs where the hospital cannot ask for a longer expiry date. According to research (Razak et al, 2012). The number of expired drugs is influenced by an improper storage system and the absence of adequate drug identity recording so that drug distribution is ineffective.

5. Percentage of Dead Stock

The stock of dead drugs shows the number of drug items for which there are no transactions in both drug income and expenditure during the year (Satibi, 2022). Losses caused by dead stock are not smooth money turnover, drug damage due to too long storage, causing drugs to expire. Data taken retrospectively for drug mutation tracing 2022 inventory report.

Table 9. Percentage of Dead Stock

Information	Sum	Standard Value
unused stock	2753	
Existing stock	22305	0%
% Dead stock	13%	

Based on the results of the research in table 9 that has been carried out, the percentage of dead stock is 13% with a standard value of 0%. This data explains that planning the amount of inventory according to drug needs is not appropriate or deviations in use should be, resulting in drug buildup in pharmaceutical warehouses. According to (Satibi, 2017) drug stock that has not been used for 3 months without transactions is referred to as dead stock. Based on the interview results, the occurrence of dead stock in Dr. Moewardi's hospital was caused by changing prescribing patterns or changing prevalence, so doctors did not prescribe the drug.

D. Use

Use is a process that begins with prescribing activities by doctors, drug services by pharmacists and monitoring drug use by patients. The goal is to protect patients from diseases related to drugs given such as allergic reactions, detect or correct the dangers of therapy given simultaneously, prevent drug toxicity and improve patient compliance through clinical pharmacy functions.

1. Number of drug items per prescription sheet

The indicator of the number of drug items per prescription sheet is intended for the measurement of polypharmacy degrees at Dr.Moewardi IFRSUD Data was taken retrospectively in the 2022 pharmaceutical installation prescribing record data

Table 10. Number of Drug Items Per Prescription Sheet

Information	Sum	Standard Value
Medicinal items written on the prescription sheet	1455	
Number of recipes	400	3,3 Indonesia
number of medicinal items	3,6	

Based on the results of research in table 10, the number of drug items per prescription sheet at the pharmacy installation of Dr. Moewardi Hospital is 3.6, which means that there are still high polypharmaceutical indications where the standard value is 3.3. Based on the IFRS Head interview, the number of drug items prescribed is based on the patient's disease pattern, but the doctor has been minimally prescribed the number of drug items according to the patient's needs.

2. Percentage of generic drug use

The indicator of the number of drug items per prescription sheet is intended for the measurement of polypharmacy degrees at Dr.Moewardi IFRSUD. The data was taken retrospectively in the 2022 pharmaceutical installation prescribing record data.

Table 11. Percentage of Generic Drug Use

Information	Sum	Standard Value
generic drug items	1060	
Prescribed drug items	1455	82-94%
% generic drug prescribing	72,85%	

Based on the results of the study in table 11, the percentage of generic drug use in the pharmaceutical installation of Dr. Moewardi Hospital is 72.85% with a standard value of 82-94%, which means that there is still a lot of use of non-generic drugs prescribed by doctors. Based on the interview of the head of the pharmaceutical installation of Dr. Moewardi Hospital, the low use of generic drugs is due to the hospital referring to the E-catalog and seeing more efficient prices. According to (Sukapti and Dwiyani, D. 2011) judging from the source of funds owned by government hospital patients, it can be divided into two groups, namely funding patients from third parties (Askes, askeskin, jamsostek) and patients who have to pay themselves (general patients or non-access patients). This grouping has its own consequences for the prescribing of generic drugs. For patients with access and askeskin because the drugs that can be claimed for payment are generic drugs or listed in the DPHO book while prescribing to general or non-access patients is usually prescribed patent drugs.

3. Average time spent serving recipes

The average prescription service time indicator is intended to assess the ability of pharmacy service speed in hospitals, the number of samples taken, namely in non-concocted prescriptions as many as 289 prescriptions and in concocted prescriptions as many as 111 prescriptions. Data was taken prospectively at Dr. Moewardi's IFRSUD at the outpatient depot on October 9-12, 2023.

Table 12. Average Time Spent Serving Recipes

Information	Sum	Standard Value
Number of non-concocted recipes	289 Recipe	Non Mixed Recipes
Average time spent	28,68 Minute	≤30 minute
Number of concoction recipes	111 Recipe	Recipe Mix
Average time spent	61,74 Minute	≤60 minute

Based on the results of research in table 12, the average time used to serve recipes in non-concocted recipes is 28.6 minutes, while the standard value is ≤30 minutes, which means it is in accordance with the standard and in concocted recipes of 61.7 minutes, while the standard value is ≤60 minutes, which means it is not up to standard. Based on the interview of the head of the hospital's pharmacy installation, Dr. Moewardi, the waiting time to serve prescriptions at concoctions often occurs a buildup of prescriptions so that the longer the time needed to serve concocted prescriptions. Based on research (Suwarto, 2011).

The need to evaluate the waiting time for prescription services in pharmaceutical installations is to find out weaknesses that can prolong prescription services, so that improvements can be made immediately in order to improve the quality of pharmaceutical services.

Table 13. Determination of Priority Scale for Handling Problems in Drug Management at the Pharmaceutical Installation of Dr. Moewardi Hospital

Stages	Problem List	Criteria			BPR	PEARL	OPR	Problem Priority
		A	B	C				
		Big	Serious	Difficult				
Selection	A	6	7	8	34,66	11111	34,66	III
Procurement	B1	6	7	6	26	11111	26	VII
	B2	8	8	7	37,33	11111	37,33	II
	B3	5	6	8	29,33	11111	29,33	V
Distribusion	C1	5	6	6	22	11111	22	VIII
	C2	6	6	7	28	11111	28	VI
	C3	9	8	8	45,33	11111	45,33	I
Use	D1	6	7	7	30,33	11111	30,33	IV
	D2	5	5	6	20	11111	20	IX
	D3	5	5	5	16,66	11111	16,66	X

Description:

A : Availability of drug items available with fornas and FRS

B1 : percentage of allocation of drug procurement funds

B2 : frequency of delayed payment by Rs against the agreed time

B3 : percentage of conformity between planning and reality

C1 : accuracy of data on the amount of drugs on the stock card

C2 : percentage of expired drug value

C3 : percentage of dead stock

D1 : Number of items per prescription sheet

D2 : Percentage of use of generic drug

D3 : Average waiting time used to serve prescriptions

The priority of problems at Dr. Moewardi's hospital using the Hanlon Method is based on the results of BPR and OPR calculations, namely the percentage of dead stock with BPR and OPR values of 45.33. The reason for the high percentage of dead stock at Dr. Moewardi's hospital is due to changing prescribing patterns or changing prevalence, so doctors do not prescribe the drug. According to (Satibi, 2014). The factor that affects dead stock is that doctors no longer prescribe available drugs so that drug stocks accumulate. Losses due to dead stock are storage that is too long causing expiration and poor money turnover.

CONCLUSION

Based on the results of research conducted at the Pharmaceutical Installation of DR. Moewardi Hospital on Analysis of drug management using the Hanlon method, it can be concluded as follows:

1. Drug management results: At the Selection Stage, the suitability of available drug items with the National Formulary is 82.80% and the Hospital Formulary is 81.41% At the procurement stage, the percentage of drug procurement fund allocation in 2022 is 17.27%. The frequency of delayed payments is 448X. The percentage of conformity between planning and reality is 87.16%. At the Distribution Stage, the accuracy of the data on the amount of drugs on the stock card is 95%. Inventory Turn Ratio (ITOR) is 15.078 times. The level of availability of the drug is 12 months. The percentage value of expired drugs is 0.04%. The percentage of dead stock is 13%. At the Stage of Use the number of drug items per prescription sheet is 3.6. The percentage of generic drug use is 72.85%. And the average waiting time to serve recipes is non-mixed recipes 28.68 minutes and concoction recipes 61.74 minutes.
2. The priority of drug management issues based on the Hanlon method is the percentage of dead stock with BPR and OPR values of 45.33
3. The strategy to improve drug management at the Pharmaceutical Installation of Dr. Moewardi Hospital is the need to monitor and supervise

drug stocks every month so that drugs that experience dead stock can be known

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