



Evaluation of Drug Management and Improvement Strategies Using the Hanlon Method in the Pharmacy Installation of Ki Ageng Selo Wirosari General Hospital, Grobogan Regency, Indonesia

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ABSTRACT

Drug management in the hospital is one of the important hospital management. Its inefficiency can have a negative impact on the hospital, both medically and economically. The purpose of this study was to evaluate drug management at the pharmacy installation of Ki Ageng Selo General Hospital by using efficiency indicators and implementing improvement strategies using the Hanlon method. This study uses a descriptive design for data that is retrospective and concurrent. Data in the form of quantitative and qualitative accompanied by interviews with related parties. All stages of drug management at the Pharmacy Installation of Ki Ageng Selo General Hospital were measured for their level of efficiency using indicators from the Ministry of Health, Permenkes, and WHO, then compared with standards and described based on priority analysis of action plans using the Hanlon method. The results of the study according to the standards were: the suitability of the available drug items with the RS Formulary (92.21%), the frequency of delayed payments (5 times), the percentage of correctness between the drug and the stock card (100%), the level of drug availability (12 months), average time spent serving prescriptions to patients (non-concocted 7.7 minutes, concocted 17 minutes), percentage of prescriptions with generic drugs (84.9%). Stages of drug management that are not in accordance with standards, namely: the percentage of available capital/funds with all the funds needed (202.14%), the percentage of drug procurement funds allocation (20.17%), the percentage of expired drug value (8.1%), the number of drug items per prescription sheet (4.27). Priorities for handling problems are as follows: 1) Monitor drugs for a maximum of 6 months before the ED, 2) Increase the role of KFT in evaluating and coordinating with doctors regarding the use of drugs to avoid polypharmacy, 3) Evaluation is needed every 3 months or 6 months for budget revisions, 4) carry out an evaluation at the end of each year to determine the budget and better coordination between drug managers and hospital fund providers.

1. Introduction

Effective and efficient drug management is one of the crucial aspects of maintaining the quality of health services in hospitals. One of the important elements in drug management is regular evaluation to ensure that the process of procurement, storage, distribution, and use of drugs runs according to established standards. One of the methods used in evaluating drug

management is the Hanlon method. The Hanlon method can help solve problems faced by hospitals regarding drug management that have been carried out so far. In the Hanlon method, from the aspect of points that can be assessed more than other methods, namely, there is ABCD, and for D, there are still 5 more points, so there are 8 points that can be assessed, while for the PSCM method, there are only 4 points



and for the USG method there are 3 points then for the Delphi method is a method using a structured questionnaire and shown to experts while for this research is descriptive research with data retrospective and concurrent without using a questionnaire but direct interviews.¹⁻⁵

The Hanlon method is a tool used to compare different health problems in different ways, relatively and not absolute, framework, as fair and objective as possible. The method used to determine the priority of the problem is by using 4 groups of criteria, namely: the size of the problem (magnitude), problem disorder (emergency), ease of problem-solving (causability), and factors that determine whether or not the program can be implemented (PEARL factor). PEARL consists of compatibility (propriety), cheap economically (economic feasibility), acceptable (acceptability), availability of human resources (resource availability), and legality.⁴⁻⁹

Ki Ageng Selo Wirosari General Hospital, located in Grobogan Regency, Indonesia, has a great responsibility to provide quality health services to the community. In an effort to improve the quality of drug management, the use of the Hanlon method as an evaluation tool can help identify potential problems in drug use and formulate appropriate improvement strategies. This study aimed to evaluate drug management and improvement strategies using the Hanlon method in the pharmacy installation of the Ki Ageng Selo Wirosari General Hospital, Grobogan Regency, Indonesia.

2. Methods

This type of research uses a descriptive method by collecting data retrospectively and concurrently to evaluate the drug management system at the pharmacy installation of Ki Ageng Selo Wirosari General Hospital in Grobogan Regency in 2022. The

data obtained is in the form of primary data and secondary data. The primary data obtained during interviews, observations, and direct observations during the research were observations of the average time used to serve prescriptions, and the accuracy of data on the number of drugs on stock cards and prescriptions. Secondary data is obtained by tracing documents in the previous year, namely in 2022, in the form of a list of planned drug needs, Hospital Formulary, list of drug procurement, drug inventory reports, reports on drug usage, expired drug reports, financial reports, purchase reports, order letters, and shipping invoices drug.

Data retrieval retrospective was carried out on several indicators, namely the suitability of drugs against the Hospital Formulary, the percentage of available capital/funds, the percentage of drug fund allocation available, the conformity of planning with the reality of each drug item, the frequency of delays in paying drug bills, the percentage of expired and damaged drugs, the level of drug availability, *turnover ratio*, the number of drug items per prescription sheet and the percentage of drugs with generic names while data collection concurrent carried out on indicators of the accuracy of data on the number of drugs on the stock card, the speed of prescription service time and interviews with related officers.

3. Results and Discussion

Based on Table 1 shows that the percentage of hospital formulary drugs is 92.21%. According to the regulation of the Minister of Health, the value of the conformity standard for drugs available in hospital formularies is 80%. The results of this study indicate the percentage item the drugs available in the hospital formulary at the pharmacy installation of Ki Ageng Selo Wirosari General Hospital is up to standard.



Table 1. Compatibility of available drug items with the hospital formulary.

Information	Total	Standard
The number of drug items in the hospital formulary	367	80%
The number of drug items available	398	
Percentage of conformity of drug items with the hospital formulary	92,21%	

Table 2 shows that the percentage of funds provided by hospitals to pharmaceutical installations for drug procurement in 2022 is 202.14%. Availability of funds can be declared efficient for drug management in hospitals if the standard value is 100%. These results indicate that the amount of funds available is

sufficient to procure drugs at the pharmacy installation of Ki Ageng Selo Wirosari General Hospital. With sufficient funds, the hospital can procure according to needs so as to ensure the availability of drugs for patients.

Table 2. Percentage of available capital/funds to the total funds needed in 2022.

Information	Budget 2022	Standard values
Total of funds required	1.635.000.000	100 %
Total of funds available	3.305.000.000	
Result percentage	202,14%	

Table 3 shows that the budget plan provided for drug procurement amounted to 20.17% of the total BLUD funds for Ki Ageng Selo Wirosari General

Hospital, so it can be said that this percentage value does not meet the standard values that have been set, which ranges from 30-40%.

Table 3. Percentage of drug procurement fund allocation in 2022.

Information	Budget 2022	Standard values
Drug procurement fund allocation	3.305.000.000	30-40%
Total hospital BLUD fund	16.380.000.000	
% Allocation of hospital pharmacy installation drug procurement fund	20,17 %	

Table 4 shows that the average frequency of delays in payment by the hospital is 5 times or 1.5% of the total invoices received, so that it can be said that this value meets the predetermined standard value, which ranges from 0-25 times. Based on a statement from the finance section at Ki Ageng Selo Wirosari General

Hospital, which caused several delayed payments because the goods/medicines ordered by the hospital were incomplete, there was an incorrect invoice and had not been corrected by the partner, so the hospital's finance department could not pay the drug bill on partners.

Table 4. The frequency of delayed payments by the hospital against the agreed time.

Information	Total	Standard
Number of invoices with pending payments	5	0-25 times
The total number of invoices received	335	
The frequency of delayed payments	5 times	
Percentage of delayed payments	1,5 %	



Table 5 shows that the accuracy between the drug and the stock card is 100%, so it can be said that this value meets the standard where the standard

value that has been set is 100%. So it can be seen that the accuracy of the warehouse clerk is very good.

Table 5. Accuracy between drugs and card stock.

Description	Total	Standard
Total of drug according to the stock card	45	100%
The number of stock cards drawn	45	
% match between drug and card stock		100%

Table 6 shows that the percentage of expired drug value is 8.1% indicating a significant loss according to a standard that the ideal percentage to express loss efficiency hospital due to expired drug is $\leq 0.2\%$. According to a statement from the warehouse staff, what caused the expired drugs to occur in 2022 was due to the fact that at that time, this hospital was still a new hospital and did not yet have consumption and morbidity data, especially for COVID-19 patients, so the stock of drugs intended for COVID-19 patients be

increased to prevent a surge in Covid-19 patients and it turns out that the number of COVID-19 patients has begun to decrease so that there are remaining stocks of the drug, which had an average ED (expired date) last year. The number of expired drug items is 23 items and the drug is intended for COVID sufferers with comorbidities, such as the use of drugs for COVID patients with comorbid heart disease. The drugs used are candesartan and clopidogrel.

Table 6. Percentage of drug value expired and broken.

Information	Value (IDR)	Standard
Total value of expired drug	31.227.449	$\leq 0.2\%$
Total stock-taking value	382.880.865,52	
Drug percentage expired/damaged	8,1 %	

Table 7 shows that the average level of drug availability in the pharmacy installation of Ki Ageng Selo Wirosari General Hospital is 12 months, and the standard value for drug availability is 12-18 months,

so it can be said to be efficient. This is because there is a direct purchasing system for medicines that are lacking/empty which guarantees the continuity of health services at the hospital.

Table 7. Drug supply level.

Description	Total	Standard
Number of drugs in a year	249.959	12-18 months
The average number of drug use per month	20.829	
Average drug availability rate	12 months	

Table 8 shows that the average prescription service time used from prescription entry, dispensing to drug delivery to patients is six working days. The average service time for non-concoction recipes is 7.7 minutes, while for concoction recipes, it is 17 minutes. The average prescription service time at the Pharmacy

Installation of Ki Ageng Selo Wirosari General Hospital is in accordance with the standard stating that the waiting time for non-concoction drug prescriptions is ≤ 30 minutes and the waiting time for concoction drug prescriptions is ≤ 60 minutes.



Table 8. The average time used to serve recipes.

	Number of recipes served	Total prescription service time (minutes)	Average prescription serving time (minutes)	Standard
Non recipes concoction	270	2079	7,7	≤ 30 minutes
Concoction recipe	30	510	17	≤ 60 minutes

Table 9 shows that the average number of drug items per prescription sheet at the pharmacy installation of Ki Ageng Selo Wirosari General Hospital is 4.27 which indicates that there is a high indication of polypharmacy where the standard value is 1.8 – 2.2. So it can be said that the use of drugs at the pharmacy installation of Ki Ageng Selo Wirosari General Hospital is still not up to standard. Writing the minimum number of drug items is intended to avoid drug side effects and interactions between drugs that are detrimental to patients. Therefore, doctors should

write prescriptions with the minimum number of drug items possible. The results of interviews with the head of IFRS (hospital pharmacy installation) stated that the variety and number of drugs prescribed by doctors were difficult to control because the role of the KFT (pharmacy and therapeutic committee) in the hospital was not maximized, plus there were quite a lot of BPJS patients in the hospital so that the use of drugs focused with the use of generic drugs, where treatment with generic drugs is indeed more prescription.

Table 9. A number of drug items per sheet recipe.

Description	Total	Standard
Total of medicine written on the prescription sheet	3857	1,8-2,2
Total of recipe sheets in 2022	903	
Total of items per recipe sheet		4,27

Table 10 shows that the percentage of prescriptions with generic drugs at the pharmacy installation of Ki Ageng Selo Wirosari General Hospital is 84.9%. This shows that the writing of generic drugs at the

pharmacy installation of Ki Ageng Selo Wirosari General Hospital is in accordance with established standards, namely 82-94%.

Table 10. Percentage of prescriptions with generic names.

Description	Total	Standard
Total of generic drug items in the prescription	3275	82-94%
Total of prescription drug items	3857	
% writing prescriptions for generic drugs		84,9%



Table 11. Problems, priorities, and solutions for drug management.

Stages	Problem	Priority	Solution
Planning	Available capital/funds with all the funds required exceed the standard value	3	Evaluation needs to be carried out every 3 months or 6 months for revisions to the budget so that funds can be transferred to other budgets that need it.
	Allocation of drug procurement funds below the standard value	4	Evaluation needs to be carried out at the end of each year for determine the drug procurement budget and better coordination between managers drugs with hospital funding providers.
Storage	The high value of expired drugs	1	It is necessary to monitor the drug for a maximum of 6 months before the drug ED period, for drug returns.
Usage	There is still a high number of medicinal items per prescription sheet	2	Increasing the role of KFT to coordinate more with doctors regarding the use of drugs to avoid polypharmacy, so that drug prescribing is more rational, effective and efficient

Storage stage with an indicator of the percentage of drug value expired. That is, it is necessary to monitor the drug for a maximum of 6 months before the ED drug period to be carried out return drug. The Usage Stage with the percentage indicator for the number of drug items per prescription sheet is to increase the role of the KFT to carry out more coordination with related doctors' usage of drugs to avoid polypharmacy so that drug prescribing is more rational, effective, and efficient. The Planning Stage with indicators of capital/funds available with the funds needed, namely evaluation, needs to be carried out every 3 months or 6 months for revisions to the budget so that funds can be transferred to other budgets that need it. The planning stage with indicators of drug procurement fund allocation, namely evaluation needs to be carried out at the end of each year to determine the drug procurement budget and better coordination between drug managers and hospital fund providers.

The role of the pharmacy and therapeutic committee (KFT) in coordinating more with doctors regarding drug use has a significant impact on avoiding polypharmacy (the use of many drugs by one patient) and making drug prescribing more rational, effective, and efficient. KFT can take a role in discussing patient

cases collaboratively. In this discussion, KFT members can contribute with more in-depth pharmacological and drug therapy insights, assisting doctors in choosing the drugs that best suit the patient's condition. This can help avoid overuse of medications you may not need or have risk drug interactions. KFT can play a role in developing drug therapy guidelines based on current medical evidence and best practice. These guidelines may include guidelines regarding the use of drugs in certain conditions, appropriate dosages, and drug interactions that need to be avoided. Doctors can refer to these guidelines in prescribing medicines, making prescribing more structured and rational. KFT can organize education and training sessions for doctors on pharmacotherapy-related issues. This can cover topics such as principles of prudent drug use, prevention of polypharmacy, and identification of risks of drug interactions. This education helps doctors better understand the impact of drug use decisions and avoid ineffective practices. KFT can monitor drug prescription patterns in hospitals on a regular basis. This can involve analysis of data regarding drug use, polypharmacy, and the clinical impact of drug therapy policies. This monitoring provides KFT with valuable



insights to identify trends and opportunities for improvement. KFT may create periodic forums or meetings between KFT members and physicians to discuss changes in therapy guidelines or issues related to drug use. This enables better collaboration and knowledge sharing which can influence drug prescribing to be more effective and targeted. By playing an active role in coordinating with doctors regarding drug use, KFT can help ensure that every drug use decision is based on careful consideration and up-to-date information. The result is more rational prescribing, avoiding excessive polypharmacy, and effective and efficient use of drugs for patients.¹⁰⁻¹⁵

The use of the Hanlon method for problem prioritization in assessing drug use in hospitals has several significant benefits. The Hanlon method assists hospitals in identifying and prioritizing drug use problems based on established criteria objective. This helps allocate resources, time and effort more effectively on issues that have a greater impact. This method helps identify drug use problems that may be overlooked or hidden. This helps prevent negative effects that can arise from inappropriate drug use. By identifying and addressing potentially hazardous drug use problems, hospitals can improve patient safety and avoid the risk of adverse drug interactions. This method allows hospitals to design specific and measurable improvement plans for medication use. This can result in prescribing drugs that are better suited to the patient's condition and best medical practice. By involving economic considerations, human resource requirements, and legality factors, hospitals can allocate existing resources wisely to improve drug management. This method provides a transparent and documented framework for making drug management decisions. Decisions taken can be justified based on predetermined criteria. This method encourages collaboration between medical teams, pharmacists, hospital management, and other stakeholders in comprehensively assessing and solving drug use problems. By focusing on issues with significant impact and feasible solutions, drug use in

hospitals can become more efficient and effective, resulting in better drug management. By assessing and improving drug therapy plans, hospitals can help improve patient understanding of medication use and improve patient adherence to medication. By implementing better medication management and focusing on patient safety, hospitals can build a better reputation for providing quality healthcare.¹⁶⁻²⁰

4. Conclusion

The stages of drug management that are given recommendations for improvement with the Hanlon method are based on the priority of the problem, namely the storage stage with an indicator of the percentage value of expired drugs, namely that it is necessary to monitor the drug a maximum of 6 months before the drug's ED period, for drug returns; The use stage with the percentage indicator for the number of drug items per prescription sheet is to increase the role of the KFT to coordinate more with doctors regarding the use of drugs to avoid polypharmacy, so that drug prescribing is more rational, effective and efficient; The planning stage with indicators of available capital/funds with the funds needed, namely the need to evaluate every 3 months or 6 months for a revision of the budget funds so that they can be transferred to other budgets that need it; The planning stage with indicators of drug procurement fund allocation is that it is necessary to evaluate at the end of each year to determine the drug procurement budget and better coordination between drug managers and hospital fund providers.

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