

Analysis of Trigger Factors in the Stagnant and Stockout of Diabetes Medicine in Islamic Hospital (RSI) Jemursari, Surabaya

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Abstract

Islamic Hospital (RSI) of Jemursari is a type B public private hospital. Drug management at Islamic Hospital (RSI) of Jemursari has not been effective with 35.29% stagnant incidence and 11.03% stockout in 2017. Stagnant drugs can cause storage costs and maintenance increases. To prevent the occurrence of drug stagnation, the drug management team must work together in carrying out the drug management cycle in the hospital. This research was an observational descriptive study with cross sectional design. The unit of analysis of this research was medical logistics, information sources of heads of pharmacy installations, heads of pharmaceutical logistics, logistics officers and data on drug use in 2017 at Islamic Hospital (RSI) of Jemursari. Primary data was obtained by indepth interviews and document observation. Secondary data was obtained from drug use documents in 2017. Data analysis techniques, the results of the research were then done editing to see the completeness of the data. After complete data, then processed using a calculating tool and set scoring then explained descriptively. The results of research that trigger the occurrence of stagnant and stockout of diabetes drug inventory are selection variables with a score of 50%, planning with a score of 33.33%, errors in receipt of invoices with an average of 10 times per month and lack of human resources namely pharmacists 10 staff, 12 pharmacy technicians and 47 pharmacy staff assistants. Monitor and evaluate the management of diabetes drug availability at Islamic Hospital (RSI) of Jemursari.

Keywords: Drug management, Stagnant, Stockout, Diabetes medication

I. INTRODUCTION

Drug management is an important element in the hospital. Ineffective management can cause negative medical and economic impacts. The negative impact of ineffective drug management is stagnant and drug stockout at the hospital (Seto, 2008). Stagnant is the remaining drug inventory more than three times the average usage, and the stockout is the remaining drug supply of less than one average use (Hadidah *et.al*, 2016). To prevent the occurrence of ineffective drug supplies, the drug management team must work together in carrying out the drug management cycle in the hospital. The drug management cycle can be seen in Figure 1.

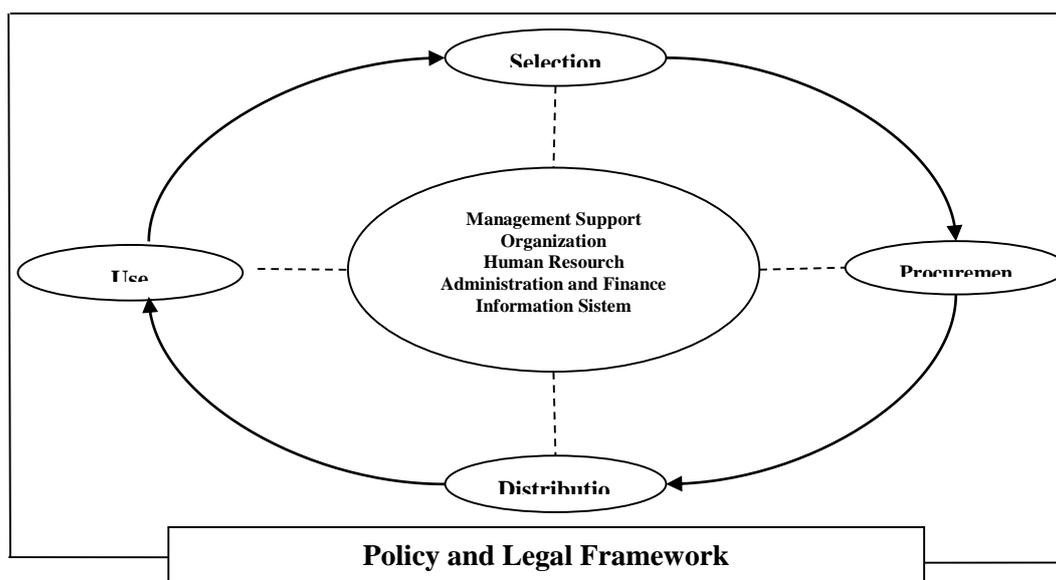


Figure 1. Drug Management Cycle

The drug management cycle consists of selection, procurement, distribution and use. The stages of drug management cycle must be supported by supporting management so that drug management can be carried out effectively and efficiently (Quick *et.al*, 2012).

1. Drug Selection

The drug selection aims to choose the drug preparations needed by the community, namely the type, the exact number and on time. The selection of drugs based on the National Formulary can guarantee rational use of drugs (Satibi *et.al*, 2010). The purpose of formulating the national formula is to improve the quality of services, safe, efficacious, quality and affordable use of drugs in the types and quantities of each layer of society. In addition, drug selection must also consider hospital treatment guidelines that have been prepared and agreed upon which aim to ensure rational use of drugs (Kemenkes, 2014).

2. Drug Procurement

Procurement is an activity to meet drug needs in accordance with the operational needs that have been established in the planning process (Kemenkes, 2014). Drug procurement has three important requirements that must be met, including: according to plan, according to ability, and according to the method or procurement system in the provision of drug procurement (Kemenkes, 2009).

3. Drug acceptance

Acceptance is the activity of receiving a drug supply in accordance with the order from the supplier to the pharmacy supply receiving team based on the specifications of the order letter (SP) and the specified sales invoice. The invoice must guarantee the suitability of the type, amount, quality and time of delivery. Pharmaceutical supplies received are the result of previous planning and procurement (Febriawati, 2013).

4. Drug Storage

Storage must ensure the quality of the drug based on pharmaceutical requirements received so that it is safe, not lost, avoid physical and chemical damage and the quality is guaranteed (Kemenkes, 2004). The pharmaceutical requirements in question include the requirements for stability and safety, sanitation, light, humidity, ventilation, and classification of drugs according to the preparation. Another type of storage method is based on storage facilities, spatial arrangement, drug preparation and quality observation (Kemenkes, 2010).

5. Drug Distribution

Drug distribution is one of the activities in order to distribute or deliver pharmaceutical preparations from storage to the service unit by guaranteeing the quality, stability, type, amount and timeliness (Kemenkes, 2014). The distribution system is divided into four, namely the distribution system of individual prescription drugs, a complete inventory distribution system in the room (floor stock), a distribution system for a combination of individual prescription drugs and a room supply, and a unit dose dispensing (UDD) distribution system (Aditama, 2003).

6. Drug Use

Drug use must be done rationally. Drug use is said to be rational if patients receive treatment according to their clinical needs, the right dose, appropriate and affordable time (Quick, *et.al*, 2012).

7. Drug Planning

Planning is an activity in determining the number and period of procurement of pharmaceutical preparations, medical devices, and consumables, to ensure the fulfillment of the right type, exact number and timely and efficient criteria (Kemenkes, 2014). Commonly used drug requirements planning methods are consumption method, morbidity method, proxy consumption method, and service-level projection of budget requirements (Quick, *et.al*, 2012).

8. Human Resources for Drugs

Human resources are a basic component of an organization, adequacy based on quality and quantity is very important to run an organization. Pharmaceutical resources include pharmacists, pharmacy technical personnel and other supporting staff to achieve the goals and objectives of hospital pharmacy installations (Kemenkes, 2014). Suitability of pharmaceutical personnel is seen based on Health Minister Regulation Number 56 of 2014.

9. Recording and reporting

The recording and reporting activities of drug management in hospitals include (BPOM RI, 2001).

- a. Drug registration and reporting to support drug planning activities include drug compilation, disease data compilation, estimated drug requirements, reconciliation of drug procurement and funding sources.
- b. Drug records and reporting to support drug supply control include stock cards, parent stock cards, procurement realization cards.
- c. Drug recording and reporting support drug distribution, among others is determination of optimum stock and calculation of drug adequacy.
- d. Recording and reporting of drug management, among others, are reports on planning, procurement, storage, distribution, use, supervision, drug transfer, and final inventory recording reports.

II. METHODS

This research was an observational descriptive study with cross sectional design. The unit of analysis of this study was the medical logistics unit of Islamic Hospital (RSI) of Jemursari pharmaceutical installation. Sources of information in this study were heads of pharmacy installations, heads of medical logistics, and logistics officers. This research was conducted in April until July 2018. Variables research was medicine management (selection, procurement, distribution, and use) and supporting management (planning, human resources, reporting and record keeping).

Primary data were obtained by conducting indepth interviews and direct observation on drug management activities at Islamic Hospital (RSI) of Jemursari. Observation were made using the observation guide sheet with the results of measurements categorized as follows: excellent (76-100%), good (51-75%), poor (26-50%) and good (<25%) in a manner calculation = $(\sum \text{correct score}) : (\sum \text{total score}) \times 100\%$. Interviews were carried out with an interview guide sheet which will be transcribed as a basis for supporting observations.

Secondary data were obtained by looking at the documents related to the research on medical logistics in Islamic Hospital (RSI) of Jemursari. The procedures and data analysis techniques, the results of research and then do the editing for the completeness of data. After complete data, then processed using a calculating tool and set scoring then explained descriptively.

III. RESULT

1. Availability of Diabetes Medicines at Islamic Hospital (RSI) of Jemursari

Drug availability is calculated by comparing the remainder of the final stock from Quarterly I-IV in 2017. Stagnant category if the remaining stock is 3 times the average usage, the normal category if the remaining stock is 1-3 times the average usage and stockout category if remaining stock ≤ 1 time average usage or stock = 0. Conditions for availability of diabetes drugs in Islamic Hospital (RSI) of Jemursari can be seen in table 1.

Table 1. Availability of Diabetes Medicines at Pharmacy Installation of Jemursari Islamic Hospital (RSI) of Surabaya

Number	Quarterly	Medicine Type	Stagnant		Stockout		Normal	
			n	%	n	%	n	%
1	I	34	13	38.24	3	8.82	18	52.94
2	II	34	10	29.41	4	11.76	20	58.82
3	III	34	14	41.18	4	11.76	16	47.06
4	IV	34	13	38.24	4	11.76	17	50.00

Based on table 1. it can be concluded that the average incidence of stagnant diabetes drugs with a percentage of 35.29%, the average stockout incidence with a percentage of 11.03% and the average normal condition with a percentage of 53.68%. Based on the Ministry of Health (2002) stated that the minimum inventory in accordance with the safety stock if the inventory is more or less than the safety stock, it will cause inventory not optimal. This can cause medical and economic losses.

2. Management of diabetes drug supplies at Islamic Hospital (RSI) of Jemursari

Management of diabetes drug supplies at Islamic Hospital (RSI) of Jemursari uses a one-door system. Pharmacy installation is headed by a pharmacist with drug management activities in the form of selection, procurement, distribution, and use with supporting management, namely planning, human resources, recording and reporting. Communication from the drug management team is needed to achieve effective and efficient management. The following are the results of the assessment of drug management activities at the Islamic Hospital (RSI) Jemursari in 2017.

Table 2. results of assessment of drug management activities at Islamic Hospital (RSI) Jemursari in 2017

Number	Activities Type	Suitability	
		Yes	No
1	Selection	50%	50%
2	Procurement	80%	20%
3	Reception	80.77%	19.23%
4	Storage	87.88%	12.12%

5	Distribution	100%	0%
6	Use	59.13%	40.87%
7	Planning	33.3%	66.67%
8	Human resources	77%	23%
9	Recording and reporting	100%	0%

- a. **Drug Selection:** Based on the results of the diabetes drug suitability analysis in table 2, it was found that 50% of the total suitability of diabetes drugs consisted of 11 types of generic drugs and 6 types of branded drugs. This means that the selection of drugs made by Islamic Hospital (RSI) of Jemursari is not good because it has not met the standards set by the Ministry of Health in 2002.
- b. **Drug Procurement:** Since joining Health BPJS in 2014, the drug procurement system at Islamic Hospital (RSI) of Jemursari was divided into two stages, namely the procurement of Health Insurance (BPJS) drugs with e-catalog and direct drug procurement. Drug procurement is done twice a month. Based on table 2 procurement of drugs into the category of very good good with a percentage of 80%.
- c. **Acceptance of drugs:** After procuring drugs the next process is acceptance, the activity of receiving drugs is done by matching the type and number of drugs received based on invoices. If there is a discrepancy between the physical goods and the invoice letter, the admission committee will confirm to the procuring party, from the procurement will return directly to the supplier. If it passes the checking, then the storage process. Based on table 2 the receipt of drugs at Islamic Hospital (RSI) of Jemursari was very good with a percentage of 80.77%. But for the average error in receipt of invoices for 2017 is 10 times based on research conducted by Pudjaningsih (1996) which states that errors in receipt of invoices must not be more than 1-9 times. This means that the error in receipt of invoices at Islamic Hospital (RSI) Jemursari is categorized as not good, this can cause inventory not optimal.
- d. **Drug Storage:** The next process of receiving drugs is storage. Storage must be able to guarantee the quality and safety of pharmaceutical preparations which include stability, sanitation, lighting, humidity, ventilation, and monitoring the quality of pharmaceutical preparations. Based on 2 storage table at Islamic Hospital (RSI) of Jemursari, it was categorized as very good with a percentage of 87.88%. The storage system uses the First In First Out and First Expired First Out systems with drug storage settings arranged according to dosage forms and alphabetically based. In addition to reviewing the storage facilities, monitoring quality observations is very important. Based on the results of interviews with drug storage officers in medical logistics, information was obtained that monitoring observations of drug quality was carried out regularly every month. If a drug inventory of poor quality is found such as changes in color, odor, preparation and sediment we immediately report to the procurement and procurement will return the drug to the supplier.
- e. **Drug Distribution:** Drug distribution is the activity of distributing pharmaceutical supplies through each depot delivery at Islamic Hospital (RSI) of Jemursari which aims to meet the drug needs in the service unit. Based on Table 2 it can be seen that the distribution of drugs in Islamic Hospital (RSI) of Jemursari is very good with a percentage of 100%. Scheduled drug distribution activities every week are on Monday to Depo 2 and inpatient units, Wednesday to Depo 1 and 5, Thursday to Depo 3, and Friday to Depo 4 and inpatient units.
- f. **Drug Us:** Based on Law Number 36 of 2009 regarding Health, it states that the use of drugs must be carried out rationally. Rational use is the exact type, amount, clinical need, dose and time of use. The use of drugs in Islamic Hospital (RSI) of Jemursari is calculated by comparing the final stock of the drug with usage in the first quarter to the fourth quarter of 2017. According to table 2, the use of diabetes drugs in 2017 with a percentage of 69.13% entered into the good category. This means that in general the use of diabetes drugs in Islamic Hospital (RSI) of Jemursari is still functional. But in the first quarter to the fourth quarter the use of diabetes drugs decreased by an average of 2.08%. The decline in drug use will potentially increase the buffer stock so that it will have an impact on the optimal drug supply. Not optimal drug supply has the potential to cause stagnant, the impact of stagnant events has the potential to increase storage costs and maintenance of drug supplies in hospitals.
- g. **Drug planning:** Good drug planning is drug planning that suits your needs and in accordance with the method of calculating needs. Drug planning at Islamic Hospital (RSI) of Jemursari uses the consumption

method and is done twice a month. Based on Table 2, it can be seen that the drug planning at Islamic Hospital (RSI) of Jemursari is not well-balanced with a percentage of 33.33%. The cause of poor drug planning is that there are no planning stages based on consumption methods. Planning based on the consumption method is drug planning that meets the planning stages such as calculation of average usage, calculation of drug vacancies, calculation of lead time, calculation of buffer stock, calculation of expired drugs, and calculating the remaining available inventory. Based on an indepth interview with the livestock planning team, information that planning at Islamic Hospital (RSI) of Jemursari only considered previous drug use, remaining stock and calculating buffer stock with a policy of 50% of usage in the previous period.

- h. Human Resources for Drug Management:** Human Resources is one of the important elements in organizational activities, as well as in drug management at Islamic Hospital (RSI) of Jemursari which must have competent human resources. The better the competency of human resources, the more reliable it will be in running the organization for the realization of a common goal, namely the creation of effective and efficient drug management. Pharmaceutical resources at Islamic Hospital (RSI) of Jemursari are divided into three parts, namely pharmacists, pharmacy technical personnel, and pharmacy personnel. Based on table 2 obtained information that pharmacists pharmacy personnel as many as 10 staff, Pharmaceutical Technical was Staff 12 and Assistant Health is 47 staff. Based on the Minister of Health Regulation Number 56 of 2014 concerning Hospital Classification and Licensing states that Pharmacist pharmacy personnel are at least 13 staff, Pharmaceutical Technical Staff of at least 27 staff. This means that pharmacy personnel at Islamic Hospital (RSI) of Jemursari are not in accordance with standards based on hospital classes.
- i. Recording and Reporting:** Recording and reporting of reports at Islamic Hospital (RSI) of Jemursari include, among others, planning, procuring, receiving, storing, distributing, and using drugs. Based on table 2 recording and reporting fall into the very good category with a percentage of 100%. Recordings made at Islamic Hospital (RSI) of Jemursari were held as a source of information in planning, procurement, and as hospital documentation. Reporting activities are carried out for monitoring and evaluating drug management at Islamic Hospital (RSI) of Jemursari.

IV. DISCUSSION

Based on the results of the research and research of the researcher, the most important factor in the occurrence of drug availability is not optimal at Islamic Hospital (RSI) of Jemursari, among others:

- a. Drug Selection:** Based on the results of the study, it was found that in the selection stage the suitability of the type of drug with National Formulary in 2017 was in the unfavorable category with a score of 50%. According to the Ministry of Health (2002) it was stated that the suitability of the type of drug with National Formulary must be 76%, meaning that the selection of diabetes drugs in Islamic Hospital (RSI) of Jemursari is not yet effective.
- b. Drug Planning:** Based on the results of the study, the planning stage was classified as not good with a percentage score of 33.33%, meaning that planning at Islamic Hospital (RSI) of Jemursari had not done the whole stages of planning based on consumption methods such as calculation of average usage, waiting time, vacancy, medication expiration, buffer stock and remaining stock. But the drug planning at Islamic Hospital (RSI) of Jemursari, which is done only calculates the remaining stock and buffer stock with the provision of 50% of usage.
- c. Acceptance:** Based on the results of the study, drug acceptance at Islamic Hospital (RSI) of Jemursari was categorized as good with a percentage of 80.77%. But the average error in receipt of invoices is more than 9 times. According to Pudjaningsih (1996) in his research on the development of indicators of drug management in hospitals it was stated that the frequency of errors in receipt of invoices should not be more than 9 times.
- d. Human Resources for Drug Management:** Based on the results of the study, human resources management of drugs is not in accordance with standards based on Health Minister Regulation Number 56 of 2014 with 10 pharmacists, 12 pharmacy personnel and 47 Pharmacist Assistant Personnel. This can lead to division of workload burden. So that the performance of the drug management team will be ineffective and have an impact on the quality of drug availability at Islamic Hospital (RSI) of Jemursari.

V. CONCLUSIONS

The availability of diabetes drugs at the Islamic Hospital (RSI) of Jemursari has a stagnant average of 35.29% in 2017. Drug management is a selection that is not in accordance with MOH standards (2002). error in receipt of invoices as much as 10 times, this is not in accordance with the standards according to Pudjaningsih (1996). Drug storage and distribution at Islamic Hospital (RSI) of Jemursari is in the very good category and the use of drugs at Islamic Hospital (RSI) of Jemursari is categorized quite good with an average use of 59.13%.

Supporting management of drug management is planning into the unfavorable category with a percentage of 33.33%, the cause is drug planning has not done all the steps in drug planning based on consumption methods. Pharmaceutical workers at Islamic Hospital (RSI) of Jemursari were included in the category not in accordance with the standards of 10 pharmacists, 12 health professionals and 46 pharmacy assistants. Recording and Reporting at Islamic Hospital (RSI) of Jemursari is in the very good category with a percentage of 100% as evidenced by the recording and reporting that uses the coputerization system and documentation files for each drug management activity at Islamic Hospital (RSI) of Jemursari.

VI. RECOMMENDATION

1. Perform needs calculations based on drug planning steps based on the consumption method, Monitoring and evaluating drug availability periodically, recruit pharmaceutical workers and evaluate the use of drugs regularly.
2. Further research is needed on the effect of clinical pharmacy management (prescribing and number of visits) on drug availability at Islamic Hospital (RSI) of Jemursari.

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