Jurnal Farmasi Galenika (*Galenika Journal of Pharmacy*) (e-Journal) 2024; 10 (1): 62 – 72
ISSN: 2442-8744 (electronic); 2442-7284 (printed)
Journal Homepage: https://bestjournal.untad.ac.id/index.php/Galenika
DOI: 10.22487/j24428744.2024.v10.i1.16479

Analysis of the Effectiveness of Drug Management Systems in Tangerang Selatan General Hospital in 2021

(*Analisis Efektivitas Sistem Pengelolaan Obat di Rumah Sakit Umum Tangerang Selatan Tahun 2021*)

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Article Info:
Received: 16 July 2023
in revised form: 15 August 2023
Accepted: 05 January 2024
Available Online: 01 March 2024

Keywords:
Effectiveness of Drug Management
Drug Distribution
Warehouse Management

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ABSTRACT

Background: Pharmaceutical services are closely related to an optimal drug management system, where with optimal drug management, drug availability can be guaranteed, and patient demand can be fulfilled. **Objectives:** This study aimed to analized the effectiveness of the drug management system at the distribution stage at the Tangerang Selatan General Hospital in 2021. **Material and Methods:** The method used wasbased on a book by Satibi in the form of percentage of compatibility of drugs with drug stock cards, Turn Over Ratio (TOR), drug availability levels, percentage of expired and damaged drugs, and percentage of dead stock as measured usedstandards. Data taken prospectively for compatibility of drugs with drug stock cards, and retrospectively for other indicators by looking at generic drug stock cards in 2021. **Results:** The results showed that the drug compatibility indicators with drug stock cards and the level of availability of drugs were in accordance with the standards, while the Turn Over Ratio (TOR) and dead stock indicators did not meet the standard indicators. **Conclusions:** The drug management system at the South Tangerang City General Hospital can still be improved.

How to cite (APA 6th Style):
Zaafira, R. D., Yardi. (2024). Analysis of the Effectiveness of Drug Management Systems in Tangerang Selatan General Hospital in 2021. *Jurnal Farmasi Galenika: Galenika Journal of Pharmacy (e-Journal), 10*(1), 62-72. doi:10.22487/j24428744.2024.v10.i1.16479

INTRODUCTION

Indonesia is included as one of the countries participating in the Good Governance in Pharmaceutical Sector program. Therefore, hospital management continues to be demanded to be able to improve the ability and quality of the services provided, where one of the improvements that must be made is the quality of service which is closely related to drug management as one of the obligations and responsibilities of the pharmaceutical installation in the hospital (Erwansani et al., 2016). Availability of drugs has a very close relationship with the drug management process, where drug availability is also a demand for health services and is one of the government's commitments in implementing health services (Kasmawati et al., 2019).

Inefficiency in drug management by hospitals can end in negative effects both medically and economically which can result in a decrease in health services and pharmaceutical services in hospitals (Erwansani et al., 2016). Several studies on drug management in Indonesia found that there were still problems with the drug distribution system. Research at the Sultan Agung Islamic Hospital in Semarang shows that the drug management system at the distribution stage is still not efficient (Nuha, 2019). The aspect of completeness of medicines at one of the hospitals in Pontianak city is also still inefficient, as evidenced by the many customers who still complain that there are medicines that must be redeemed outside the hospital due to the availability of available drug stocks (Erwansani et al., 2016). Another study at Ajibarang Hospital showed that the turnover ratio of Ajibarang Hospital was still below the standard, indicating that there was an inefficient capital turnover (Supriani, 2018).

Previous research at the South Tangerang General Hospital which examined drug distribution stated that the hospital still had several problems in the pharmaceutical installation (Rahmayanti, 2017). Tangerang City Public Hospital is a government health service facility in the South Tangerang City area which was built to address problems in the health sector and improve the health status of the people of South Tangerang City. This hospital was built in 2010 for the reason of a lack of health services in South Tangerang City where hospital referral cases are high but government hospitals are relatively far away (Pemkot Tangsel, 2017). The hospital is classified as class C with specialist and sub-specialist services (Listiyono, 2015). In order to improve health services in South Tangerang City and to evaluate the government's commitment to implementing optimal health services, it is necessary to continue to evaluate the existing system at the hospital.

As stated in the Regulation of the Minister of Health of the Republic of Indonesia number 72 of 2016 concerning Pharmaceutical Service Standards in Hospitals (Kementerian Kesehatan RI, 2016), distribution is one of the mandatory pharmaceutical services. Even so, there are still many hospitals that have problems in the drug distribution system. Therefore, it is necessary to carry out further research

regarding drug management at the distribution stage at the South Tangerang General Hospital (RSU) to complement previous research regarding the drug distribution system which still has several problems in its distribution channel.

MATERIAL AND METHODS

Materials

This research was conducted by looking at generic drug stock cards and other archives in 2021 at the Tangerang General Hospital. Generic drugs are drugs that have exceeded their patent period (Mardiati & Wiedyaningsih, 2015). Data was collected prospectively to analyze the percentage of compatibility between drugs and drug stock cards, namely during March 2022, and used a retrospective method to calculate the Turn Over Ratio (TOR) value, the level of drug availability, the percentage of expired and damaged drug values, and the percentage of dead stock, that is, during 2021.

Methods

Method in the form of quantitative analytic descriptive observation through calculating drug stocks and other archives at the South Tangerang City General Hospital and calculating compatibility with standard indicators obtained from WHO (1993), Pudjaningsih (1993) and the Ministry of Health of the Republic of Indonesia (2006) quoted from the book by Satibi (2018). This study aimed to reviewed, described, and drew conclusions regarding the efficiency of drug management, by calculated indicators that have been determined in the literature, including:

1. Compatibility between drugs and stock cards is obtained by matched the number of drug stock card data and the number of drug items in the Pharmacy Installation warehouse in February 2022. This indicator only requires 10% of the total sample used. Formula used for this indicator was:

$$Drug\ Stock\ Card\ Compatibility = \frac{\text{Percentage of Compatibility of Drugs with Stock Card}}{\text{Sample}} \text{ x } 100\%$$

2. This indicator is important to calculate in order to determine the accuracy of drug data collection by warehouse staff, as well as to monitor the amount of drug inventory and anticipate drugs that fall into the fast-moving category so that they can run out before the planned time. The standard for this indicator is one hundred percent, which means there cannot be the slightest error in the recording process.T urnover ratio, obtained through archives of South Tangerang General Hospital turnover documents in the last year, namely 2021 in rupiah, which then calculated capital turnover by comparing it with data on the average value of drug supplies in 2021. Formula used for this indicator was:

$$\text{TOR} = \frac{\text{Cost of Goods Sold (COGS)}}{\text{Average Inventory Value}}$$

Therefore, the Turn Over Ratio (TOR) value is very important to evaluate to determine the efficiency of hospital management. If the Turn Over Ratio (TOR) value is not appropriate, it can be interpreted that economically, the total value of drug supplies is not efficient so that losses can occur (Oktaviani et al., 2018). Standard for this indicator was 8-12 times.

3. The level of drug availability, obtained through stock cards for all samples which will later be calculated for the total availability of drugs in the last year, namely 2021, which is then divided by the average monthly drug use during 2021. Formula used for this indicator was:

$$\text{Drug Availability} = \frac{\text{Total drug stock for 1 year}}{\text{Average Drug Use per Month}} \text{ x 1 month}$$

The availability of good medicines will increase the reach of medicines and influence people's views regarding the quality of health services. Unavailability of medicines, whether excessive or insufficient, can be caused by unequal distribution of medicines. The standard set is 0%.

4. Percentage of expired and damaged drugs, obtained through document archives of expired or damaged drugs in 2021 in rupiah value for each item, and compared with hospitalized stock values. Formula used for this indicator was:

$$\text{Expired and Damaged Percentage} = \frac{\text{Number of expired and damaged drugs}}{\text{Items of Total Drugs}} \text{ x } 100\%$$

This indicator is important to know to calculate the amount of hospital losses due to drugs. The large percentage value of expired drugs indicates that there is inaccuracy in the planning process and deficiencies in monitoring the quality of drugs in the drug storage process (Satibi, 2018). The standard for this indicator is 0%

5. Percentage of dead stock, obtained through a sample stock card which is then calculated by the number of drug items that have not been used for three months at the South Tangerang General Hospital and divided by the total number of drug items that have stock in 2021. Formula used for this indicator was:

$$\text{Dead Stock Percentage} = \frac{\text{Items of Drug that have not been used for 3 Months}}{\text{Items of Drug with Stock}} \text{ x } 100\%$$

This indicator aims to determine unused medication for 3 months. The occurrence of dead stock can be caused by poor planning for drug procurement so that there are several drugs that are not used by the hospital. According to the WHO indicator (1993) quoted from Satibi (2018), the standard for this indicator is 0%, which means there should be no dead stock during the distribution stage.

RESULTS AND DISCUSSION

Tangerang Selatan General Hospital has its own SOP (Standard Operating Procedure) for drug management, from procurement to destruction. This SOP must be obeyed by every officer on duty at the hospital. Drug procurement itself has a very large influence on the availability of drugs in hospitals which can affect hospital services. The procurement of medicines is carried out by calculating the patient's consumption level of the medicines to be procured. For the smooth running of the procurement process, it is necessary to have a structure in the form of officers who have been trained and are proficient in procurement issues, appropriate methods and procedures, as well as a good information system with adequate funding and facilities (Quick et al., 2012).

The drug management process at the drug procurement stage is very influential on the level of drug availability as well as in terms of the economy in the hospital (Ulfah et al., 2018). If there is a problem in the procurement of medicines, such as if they are not managed carefully and responsibly, this can affect the hospital's income and cause loss of income (Susanto et al., 2017).

As for the distribution system, South Tangerang has a one-door system, where this distribution system upholds one policy and one operational standard. The Pharmacy Installation has full responsibility for all drugs circulating in the hospital and implements one SOP owned by the Hospital (Renni, 2012). Based on this, the results of the indicators of the effectiveness of the drug management system are as follows:

Table 1. Results of Effectiveness of Drug Management System in Tangerang Selatan General Hospital

Annotation	Compatibility with Stock Card	Turnover Ratio	Drug Availability	Dead Stock	Expired/Damaged Drugs
Result	100%	6,25 times	14,70 months	14,42%	Not Available
Standard	100%	8-12 times	12-18 months	0%	0%
Conclusion	Fulfilled	Not Fulfilled	Fulfilled	Not Fulfilled	Not Available

The drug compatibility indicator with the drug stock card aims to determine the accuracy of officers in recording changes in drug stock in the Hospital Pharmacy Installation warehouse by:
Table 2. Results of Drug Stock Card Compatibility

Annotation	Value
Number of Total Drugs	31
Stock Cards Compatible	31
Percentage	100%

The results of the calculation of this indicator make the percentage of drug compatibility with the drug stock card equal to 100%, and has entered the standard from Pudjaningsih (1993) obtained from a book by Satibi, namely 100%. These results are better than the results of research at the Surakarta Regional General Hospital in 2018 which had a drug compatibility percentage of 98.44% (Desi Widyawati, 2019) and are in line with the results of research at the Sultan Agung Islamic Hospital which had a percentage result of 100% (Nuha, 2019). If there is a discrepancy or difference between the drug stock card and drug items, it can increase dead stock which can end in an increase in the number of medicines that are expired or damaged (Linda et al., 2020).

Table 3. Results of Turnover Ratio

Annotation	Value
Number of Total Drugs	291
Total Turnover Ratio	1821,35
Average Turnover Ratio	6,25

The Turn Over Ratio (TOR) indicator needs to be carried out to find out how many times the capital turnover in the hospital is in one year. This ratio is a fairly popular indication used by management to assess operational efficiency and determine whether management has properly controlled capital in inventory. The less the TOR value, the more inventory is stockpiled and can indicate that drug management has too much capital and stops at inventory (Gilang, 2016).

The calculation results showed that the Turn Over Ratio (TOR) value in 2021 was 6.24 times, where this value is not in accordance with the standards of Pudjaningsih (1993) obtained from a book by Satibi, which is 8-12 times. This result is still under research at the Sultan Agung Islamic Hospital, which is 12.6 times (Nuha, 2019). The low value of the Turn Over Ratio indicates that the amount of drug inventory is high and usage is low so that it can reduce the TOR value and increase drug storage costs and leads to costs (Oktaviani et al., 2018). On the other hand, the greater the TOR value, the higher the efficiency of drug management because it shows that capital turnover is effective (Dwi et al., 2021). This high supply of drugs even when the TOR values were low is caused by South Tangerang General Hospital's focus to supply the needs of patients. The hospitalhas to has a sufficiently high supply of drugs to anticipate drug shortages so that the drug needs for patients can continue to be met. Medicines that have a very high TOR value are caused by the low initial supply of drugs in 2021 which then increases in the amount of the next purchase and the high demand for hospital units so that the capital turnover is calculated to be larger.

To manage these problems, Tangerang Selatan General Hospital can improve their method of recording medicines on stock cards by using an integrated computerized system to record the expenditure and entry of medicines. For Turnover Ratio, recommendations need to be made for procuring drugs other than the patient consumption method currently used by hospitals

The drug availability level indicator is used to view drug supplies in hospitals. Too much drug supply in the hospital will increase the risk of damage to the drug, as well as increase the expiry value so that it tends to be higher. In addition, it can also increase the risk of drug storage, as well as greater maintenance costs. Conversely, if there is a shortage, it will affect the quality of pharmaceutical services to patients, where patients cannot get the drugs they need at the hospital (Rofiq et al., 2020).

Table 4. Results of Drugs Availability

Annotation	Value
Number of Total Drugs	305
Total Drugs Availability	4482,04
Average Drugs Availability	14,70

Based on the results of processing data on drug availability in 2021, it was found that the final result was 14.70 months, which still met the standards set by the Indonesian Ministry of Health (2008) from a book by Satibi, namely 12-18 months. Overall, the level of availability of generic drugs at the South Tangerang City General Hospital is still very good. This result is in line with the results of research from the Sultan Agung Islamic Hospital which has drug availability of 16.2 months (Nuha, 2019). This result is also in line with other studies at the Surakarta Regional General Hospital, namely 12.29 months (Desi, 2019)

The percentage of dead stock is calculated to determine the number of drug items that have not been issued for 3 months in 2021. This data is obtained by looked at the drug stock cards for 2021 which have not experienced expenditure for three months and compared it with the number of drug stock cards of Generic medicines that still have stock. The samples for this indicator were stock cards of generic medicines. The acquisition of this data was taken simultaneously with the level of drug availability by observing the date of issue of each drug stock item on the drug stock card for time efficiency. Medicine items that have not been purchased or spent for three months will be counted as dead stock medicine cards. The results will then be compared with the total drug items that have stock.

Table 5. Results of Total Dead Stock

Annotation	Value
Number of Total Drugs	305
Total Deadstock	44
Percentage	14,42%

The results showed that the percentage of dead stock of generic medicines at South Tangerang City General Hospital in 2021 still has a fairly high value, namely 14.42% and does not meet the standards set by WHO (1993) obtained from a book by Satibi, namely 0%. This is in line with research at the Surakarta Hospital Pharmacy Installation Warehouse in 2018 which had a yield of 11.33% (Desi, 2019) and at RSI Sultan Agung which had a yield of 9.8% (Nuha, 2019). The high percentage of dead stock can be caused by a number of things, including the presence of other levels for the same active substance so that other levels are used more frequently. Such as Simvastatin 10 mg, where Simvastatin 20 mg is used more often so it is not included in the list of drugs that are in dead stock. In addition, the percentage of dead stock is also influenced by the speed of movement of these drugs. Several generic drugs at the South Tangerang General Hospital are included in the slow-moving category. The management of this category of drugs is very important because each drug item must be distributed immediately before its usage period expires (Balaji & Kumar, 2013).

As for percentage of damaged and expired drug data cannot be attached due to certain policies from the hospital Expired drugs are drugs that have passed their useful life or expiration date (Khairani et al., 2021). Meanwhile, damaged drugs can be caused by internal and external factors. Internal factors, for example, such as physical changes in the drug, such as changing the color of the drug or contamination by foreign particles. While examples of external factors are drug storage rooms that are not in accordance with standards and a drug arrangement system that is not good (Khairani et al., 2021). The standard of this indicator is 0%, means that there should be no drugs that are expired or damaged (Satibi, 2018).. Problems about drugs availability could be fixed using the EOQ method. The EOQ (Economic Order Quantity) method can be used to determine the required order quantity. In addition, drug procurement should be planned at shorter time intervals so that procurement does not pile up. Hospitals can carry out further procurement if existing goods are running low. This method was proven to be effective for drugs procurement in Pharmacy Installation Hospital in Mojokerto City that stated that the TOR value was 28.26 times after using this method (Samsu, 2021).

Tangerang Selatan General Hospital can improve their drugs availability by including the ABC methods in addition to patient’s consumption level. ABC analysis has a main focus on grouping inventories that

have high value, and can be carried out based on the cumulative amount of use and investment value of each existing inventory, where this analysis requires data in the form of annual usage of each drug item in the hospital (Irma, 2019). In addition to using the ABC analysis method to procure and minimize costs, the EOQ (Economic Order Quantity) and EOI (Economic Order Interval) methods can be applied to determine the number of inventory orders and order intervals to minimize excess stock and minimize costs (Satibi, 2018). As for the dead stock, it can be reduced by minimizing the stock of slow-moving drugs. ABC method has been conducted in Pelamonia Hospital and shows that the inventory control has been carried out more efficiency (Veronica, 2018).

CONCLUSION

Based on the results of the study, it can be concluded that the compatibility of the drug with the drug stock card and the level of drug availability have met the standards, while the TOR (Turn Over Ratio) and percentage of dead stock at the South Tangerang City General Hospital in 2021 have not met the standards. This shows that the drug management system at the distribution stage at the South Tangerang City General Hospital can still be improved.

CONFLICT OF INTEREST

The authors declare no conflict of interest

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