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RESEARCH ARTICLE

Evaluation of Drug Management Before and During The COVID-19 Pandemic in The Pharmaceutical Installation of NTB Provincial Hospital

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ABSTRACT

The Corona Virus Disease-2019 (COVID-19) pandemic that occurred from 2019 to 2023 and has spread to nearly 190 countries in the world has caused a shortage of drug supply. The need for public medicines that must be available for health services requires hospitals to fulfill this need. Currently, the COVID-19 pandemic situation is ongoing, so hospitals must be prepared to provide health services to patients. This study aims to evaluate drug management in the Pharmacy Installation of the NTB Provincial Hospital before the COVID-19 pandemic in 2019 and during the COVID-19 pandemic in 2020. This study used a descriptive-evaluative method. The main data was collected through documents containing specific data on drug management history. Supporting data was collected through interviews with the pharmaceutical installation. The results of the suitability of drug management in the Pharmacy Installation of the NTB Provincial Hospital before the COVID-19 pandemic in 2019 obtained 5 indicators that did not meet the standards and 6 indicators that met the standards while during the COVID-19 pandemic in 2020, 7 indicators did not meet the standards and 4 indicators that met the standards. It was determined that drug management diminished during the COVID-19 pandemic.

Keywords: COVID-19, drug, management, pharmaceutical, suitability

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Introduction

Corona Virus Disease-2019 (COVID-19) is a new infectious disease that has a high contagious ability so that disease transmission takes place quickly. The World Health Organization (WHO) declared COVID-19 a pandemic in March 2020. Indonesia is one of the countries that is also affected by the COVID-19 pandemic. Indonesia does not carry out a lockdown system, but road access restrictions are carried out in several areas to reduce the spread of COVID-19 to other areas. The ongoing pandemic has disrupted the distribution of medicines and medical devices and limited supplies [1].

Health services are increasingly needed during the COVID-19 pandemic. The public's need for medicines continues to increase but the supply of drugs is still insufficient and unaffordable prices are a worldwide problem, including in Europe [2]. Italy was one of the countries that was not prepared when facing the COVID-19 pandemic in the first wave so they needed more time to prepare health services [3]. Increased demand can cause drug shortages so that patients receive treatment late and make patients non-compliant [4]. Poor control of drug supplies can cause stockouts (shortages or vacancies in drug supplies) and stagnant (excess drug supplies). Stagnant drug supplies are not good because they can cause drug expiration and damage when not stored properly [5].

The need for community drugs that must be available for health services makes hospitals must try to fulfill and must be ready to provide health services to patients. In a previous study on the evaluation of drug management that was conducted in 2017 at the Pharmacy Installation of the Regional General Hospital (RSUD) of West Nusa Tenggara Province (NTB), it was found that there was still management that was not in accordance with the standards [6]. The COVID-19 pandemic needs to be faced with wise use of resources and remain prepared for the future [7].

The latest evaluation needs to be done to find out the management of drugs in hospitals during the COVID-19 pandemic. A good level of drug availability and according to standards can meet drug needs during the COVID-19 pandemic. Therefore, this study was conducted to determine drug management in the Pharmacy Installation of the NTB Provincial Hospital before the COVID-19 pandemic and during the COVID-19 pandemic.

Materials and Methods

Materials

The materials used in the study were obtained from the review of drug management documents (Drug Requirement Plan/RKO and stock-taking), interviews, and observations at the NTB Provincial General Hospital Installation.

Methods

This study is a descriptive-evaluative study that aims to disseminate drug management (selection, procurement, distribution, and use of drugs) before the COVID-19 pandemic and during the COVID-19 pandemic. The study was conducted

at the Pharmacy Installation of the NTB Provincial Hospital in September – October 2022. Retrospective data collection in 2019, which represents the period before the COVID-19 pandemic, and 2020, which represents the COVID-19 pandemic period, was carried out in two ways. The inclusion data required are in the form of finances and drugs owned. First, data collected through documents that contained specific information about the history of drug management. Second, supporting data collection through interviews with a list of questions that have been prepared for pharmacists and the drug procurement department at the hospital. This qualitative approach aimed to gather comprehensive insights into the challenges faced during the pandemic and the strategies employed for effective drug management. By combining document analysis with firsthand accounts, the study seeks to provide a thorough understanding of the financial and logistical impacts on pharmacy operations during this unprecedented time.

Result

Hospital pharmacy management needs to conduct a comprehensive evaluation of drug management according to service standard guidelines to always maintain the quality of service to the community. The Pharmacy Installation is in charge of carrying out drug management activities in hospitals which include 4 stages, namely selection, planning and procurement, distribution, and use.

Table 1. Drug management in the pharmaceutical installation of NTB Provincial Hospital

Stage	Indicator	Years		Standard
		2019	2020	
Selection	Conformity to national formulary (Fornas) (%)	100	98.3	100
Planning and procurement	Percentage of drug procurement fund allocation (%)	22.38	15.86	30-40
	Capital funds available with overall funds required (%)	100	107	100
	Percentage of procurement compliance with actual use for each drug item (%)	85.7	82.8	100
	Frequency of delayed payments by the hospital against a predetermined time (times)	0	1	1-9
Distribution	Match between drugs and stock cards (%)	97.7	92.9	100
	Turn over ratio (times)	6.4	6	8-12
	Drug availability rate	19	37	12-18
	Percentage value of expired and damaged drugs (%)	0.008	0.018	0-0.25
Use	Number of drug items per prescription sheet	2.6	3.2	3.3
	Percentage of prescriptions with generic drugs (%)	91	89	82-94

Discussion

Selection

Drug management starts from the selection stage. The percentage of item conformity to national formulary (Fornas) can be seen in **Table 1**. According to the Indonesian Ministry of Health in 2016, the standard of conformity of drug items with Fornas is 100%. The results showed that in 2019 the suitability of drugs with Fornas was in accordance with the standard, while in 2020 it was still not in accordance with the standard. This shows the lack of thoroughness of the Pharmacy and Therapy Commission (KFT) in drug selection in 2020, where there has been no formulary update which at that time required additional treatment for COVID-19. The absence of an update to the national formulary means that there is no reference for drugs that must be met by hospitals.

Planning and Procurement

The planning and procurement stage begins by looking at the percentage of available funding allocations. The percentage allocation of available drug procurement funds at the NTB Provincial Hospital in 2019 and 2020 is not efficient when compared to the standard value.

Based on the results of interviews with the finance department that drug procurement is always approved and from the results of drug inventory has met the standard, meaning that the total drug procurement funds needed by the NTB Provincial Hospital have indeed been fulfilled even though it is not in accordance with the standard allocation of IFRS drug procurement funds according to the Ministry of Health in 2008.

The results of this study are in line with previous research by Wibowo *et al.* [8], at Tugurejo Semarang Hospital in 2020 for the percentage allocation of drug procurement funds of 20%. According to Indriana *et al.* [9], at RSUA in 2020 it was 19%. Another study by Dewi *et al.* [10], obtained that the allocation of funds at Pandan Arang Hospital was 33%, which means that it was in accordance with the standard. This is because the finance department at Pandan Arang Boyolali Hospital received government subsidies from the hospital's operational and non-operational revenues, while based on the results of other interviews with the finance department of the NTB Provincial Hospital only obtained funds through regional public service agency (BLUD) and in 2020 when COVID-19 claims were made to the Social Security Organizing Agency (BPJS) and direct observation of the NTB Provincial Hospital is still under construction. The hospital already has a standard percentage of drug procurement fund allocation determined by the health department of 30-40%.

The percentage of capital funds available with the total funds needed in 2019 and 2020 as shown in **Table 1** is in accordance with the standards set by the Ministry of Health in 2008 and compared to other studies Indriana *et al.* [9], at RSUA in 2020 and Wibowo *et al.* [8], at RSUD Tugurejo Semarang in 2020 the percentage of procurement funds was 100% which was carried out during the COVID-19 pandemic. Another study by Dewi *et al.* [10], showed that the allocation of available funds at Pandan Arang Boyolali Hospital exceeded 100% because the budget given to the pharmaceutical installation was always given more as a buffer fund to be used if there was just in time procurement, while the NTB Provincial Hospital provided funds in accordance with what was requested by

the drug procurement committee. Changes in the value of the budget received seen between 2019 and 2020 decreased for drug procurement and the value of the allocation of funds realized in 2020 increased by more than 100% due to large inventories with a value of 7.5 billion and a decrease in the number of patients and changes in circumstances during the COVID-19 pandemic which made an increase in realization.

The procurement of drugs carried out annually illustrates the effectiveness of the drugs purchased and then combined with the year-end stock to become the total drugs owned for drug use needs. Excessive drugs or drugs that are not in accordance with the plan also indicate that the procurement is not optimal due to the accumulation or availability of old drugs. The percentage in **Table 1** shows that between the procurement plan and the reality of use has decreased in 2019 and 2020. In 2020, there was a decrease in the percentage of procurement and total which occurred due to using ineffective consumption methods to deal with the COVID-19 pandemic because there were drastic changes in drug demand so that it could not predict the special circumstances of the pandemic that occurred which caused waste or losses. Other research results state that drug procurement mismatches are influenced by inaccurate planning. This can be caused by doctor prescribing and changing disease patterns [11].

The frequency of delayed payments was obtained through the finance department of the NTB Provincial Hospital which can be seen in **Table 1**. The frequency of delayed payments in 2020 against the agreed time is one payment, meaning that it is still within the standard, namely 1-9 times Wati *et al.* [12], while in 2019 at the NTB Provincial Hospital there were no delays in payments by the hospital. This is due to the good planning carried out by hospital management so that late payment events rarely occur. Delays in 2020 occurred due to the length of payment of BPJS fund claims which made financial payments by hospitals using BLUD funds (BPJS claim payment income and cash payments). Another study by Karimah *et al.* [13], found that the frequency of delayed payments by Roemani Muhammadiyah Semarang Hospital was 1-42 times because the administration time at the hospital required a long process and the counterparty sent the payment invoice close to the due date.

Distribution

The accuracy of the number of drugs and stock cards aims to determine the accuracy of officers in the Pharmaceutical Installation in storing drug supplies in the warehouse. The number of samples taken in this study was 10% of the total number of drug items available [14]. The standard value for the match between the number of drugs on the stock card should be 100% while the result is still below 100%. This shows that warehouse officers at the Pharmaceutical Installation of the NTB Provincial Hospital have not been careful in storing drug supplies. Inaccurate stock card recording can cause confusion in seeing the condition of drug stocks in the empty, lacking, safe and excess categories, so that in the future it will affect the planning process and drug requests so that it can be said that administration in the warehouse has not been carried out optimally and efficiently. Some of the causes include the Management Information System used is still manual and the service conditions are quite crowded so it is not conducive to recording drug stocks [14]. This is in line with the SOP that has not been implemented.

Turn Over Ratio (TOR) is used to determine how many times the capital turns over in one year of inventory. It is also used to evaluate the efficiency of drug management. The higher the TOR value, the more efficient the drug management. TOR is obtained through data from the warehouse section of the Pharmaceutical Installation of the NTB Provincial Hospital. The TOR calculation uses the Inventory Turn Over Ratio (ITOR) formula based on drug turnover data at the Pharmaceutical Installation of the NTB Provincial Hospital in 2019 and 2020. The ITOR value of the Pharmaceutical Installation of the NTB Provincial Hospital in 2019 and 2020 is still not in accordance with the standard, which is 8-12 times In 2020, there was a decrease in the TOR value due to a decrease in the number of patients during the COVID-19 pandemic and the Provincial Hospital imposed patient restrictions so that procurement took longer than usual. The results of the study show that the TOR value of the Pharmacy Installation of RSAD dr. R. Ismoyo Kendari in 2020 is 4.85 times which is also not in accordance with the standard. Capital turnover is strongly influenced by expired drugs and drugs classified as dead stock, so that a lot of drug stock does not experience movement or vice versa due to unsold stock causing cash flow to not run [14].

Measurement of drug availability indicators is intended to be able to determine how much the level of drug adequacy is needed for one year. The availability of drugs in the Pharmaceutical Installation of the NTB Provincial Hospital obtained based on the observation of data in 2019 and 2020 exceeds the WHO standard of 12-18. The availability of drugs in the Pharmacy Installation of the NTB Provincial Hospital in 2019 on average was still above the maximum standard with a total drug item exceeding half, while during the COVID-19 pandemic in 2020 it increased almost twice from the previous year. No drug in 2020 has a supply time that meets the standard because the COVID-19 pandemic affects the number of patients with patient restrictions. In another study conducted by Indriana [9] stated that the level of drug availability at the RSUA Pharmacy Intalasi in 2020 was at 15.45 months. The discrepancy in the results of this study can be caused by changing disease patterns. Restrictions on outdoor activities implemented during the COVID-19 pandemic led to changes in people's lifestyles in the form of decreased participation in physical activity and changes in diet, and thus changes in disease patterns. The 10 most common diseases for hospitalization at the NTB Provincial Hospital have changed with the presence of COVID-19. This shift in disease patterns has led to alterations in the demand for medications in hospitals.

The purpose of evaluating expired or damaged drugs is to determine the value of losses due to drugs. The percentage and value of expired and/or damaged drugs were obtained through data from the warehouse section of the NTB Provincial Hospital Pharmacy Installation. The percentage value of expired and damaged drugs in 2019 and 2020 did not comply with the indicator standard of 0-0.25%. There was an increase or change in supervision carried out by IFRS employees compared to 2017 from the results of previous studies. The increase in the value of expired and/or damaged drugs in 2019 to 2020 could be influenced by the pandemic that occurred due to changes in disease patterns during the COVID-19 pandemic [15]. The things that caused expired and/or damaged drugs based on the results of interviews with the procurement section

and warehouse head were due to the lack of accuracy of IFRS employees in recording expired drugs and stock opname and in the procurement of drugs in the previous year did not pay attention to the RKO so that there were still some expired drugs. In another study, Khairani *et al.* [16], in 2019 expired drugs were influenced by an inappropriate storage system and the absence of adequate drug identity recording so that drug distribution was ineffective.

Use

The indicator of the average number of drug items per prescription sheet aims to determine whether polypharmacy occurs or not. Polypharmacy is the use of multiple drugs in a patient that can put the patient in a dangerous condition, namely adverse reactions and poor clinical outcomes. WHO has prioritized reducing polypharmacy which aims to halve the global burden of medication-related harm [17]. The average number of drug items per prescription in the Pharmaceutical Installation of the NTB Provincial Hospital in 2019 and 2020 shows that it is still below the standard limit of drugs in the prescription or no polypharmacy occurs. If the standard set is 3.3, it can be said that drug management in the Pharmaceutical Installation of the NTB Provincial Hospital has met the standard. This is an improvement in drug management by the Pharmacy Installation of the NTB Provincial Hospital compared to previously in 2017 by Oktaviani *et al.* [6], which still experienced polypharmacy because it was on the threshold of the maximum number of drugs in the prescription. In 2020 the COVID-19 pandemic caused an increase in the number of drugs in prescriptions because the NTB Provincial Hospital became the final referral hospital for COVID-19 patients whose prescriptions consisted of antibiotics, antivirals, symptomatic drugs, comorbid therapy, vitamins, and comorbidities if any.

The indicator of the percentage of prescription of drugs with generic names aims to determine the trend of prescribing drugs with generic names. Generic drugs are drugs that copy originator drugs and provide the same efficacy and safety as patented drugs. The price of generic drugs is cheaper than patented drugs, but not because of low quality or efficacy; but because generic drugs do not require expensive research and development costs like originator or patented drugs [18]. The percentage of prescribing with generic names was obtained through the archives of the Pharmacy Installation of the NTB Provincial Hospital. The percentage of drugs with generic names prescribed at the NTB Provincial Hospital in 2019 and 2020 showed figures of 91% and 89%. When compared to the standard set by WHO, which is 82-94%, the results are in accordance with the standard. Regulations regarding the number of generic drugs in Indonesia are regulated in several regulations, including the Regulation of the Minister of Health Number HK.02.02/MENKES/068/I/2010 and the Regulation of the Minister of Health Number 085/MENKES/PER/l/1989. These regulations regulate the obligation to write prescriptions and/or the use of generic drugs in government health care facilities. This is due to the awareness of doctors to write generic prescriptions in government health care facilities and good cooperation between professions. Prescriptions given in 2020 have decreased the use of generic drugs due to the COVID-19 pandemic, favipiravir and remdesivir drugs are widely prescribed and as the final referral for COVID-19 patients and patient restrictions carried out by the NTB Provincial Hospital. Another study by Diana *et al.* [19], showed that the use of generic drugs at Tora Belo Hospital in 2018 amounted to 74.89% of the total prescriptions found, there were still many uses of patent drugs because they were not available in their generic form.

Conclusion

The suitability of drug management management in the Pharmaceutical Installation of the NTB Provincial Hospital before the COVID-19 pandemic in 2019 there were still 5 indicators that did not meet the standards and 6 indicators that met the standards while during the COVID-19 pandemic in 2020 there were 7 indicators that did not meet the standards and 4 indicators that met the standards. Based on research, it is known that drug management at the NTB Provincial Hospital during the COVID-19 pandemic has decreased, such as in the available capital funds with the total funds and compliance with the national formulary because the hospital was not ready to face the pandemic.

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