

How to Cite:

Alfulaila, A., Purwidyaningrum, I., & Harsono, S. B. (2023). Evaluation of drug inventory management in Anwar Medika Hospital Sidoarjo. *International Journal of Health Sciences*, 7(S1), 2954–2965. <https://doi.org/10.53730/ijhs.v7nS1.14617>

Evaluation of drug inventory management in Anwar Medika Hospital Sidoarjo

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Abstract---Drug management is carried out effectively and efficiently to prevent drug shortages, drug prescription outside the formulary. Drug management at Anwar Medika Hospital Pharmacy Installation has not been carried out according to standards. This study aims to evaluate the management of drug management at the Pharmacy Installation of Anwar Medika Hospital and to make recommendations regarding the problems that occur. This research is a descriptive verification study with qualitative and quantitative data. The samples used were primary and secondary data from selection, planning, procurement, receipt, storage, distribution, Evaluated use of drugs based on BPK, WHO and Permenkes 72/2016. The evaluation results that do not meet the standards identified the root of the problem using the fishbone, determining the priority of the problem using the CARL method, recommending alternative solutions using the PEARL method. The results of drug management at the Pharmacy Installation of Anwar Medika Hospital was not standard. Problems that occur due to non-compliance with prescription writing according to the Hospital Drug Formulary because the latest hospital formulary has not been formed, suppliers do not comply with cooperation contracts because the availability of drugs at distributors, and inventory stock is not optimal either manually or in a system because of the number of human resources. pharmacy is not suitable based on workload calculations. The priority recommendations for alternative solutions

given are increasing the number of pharmaceutical human resources, making formulary e-books placed on the computers of all units, and implementing procurement methods based on EOQ.

Keywords---evaluation, pharmacy management, CARL.

Introduction

The management of medicines and medical devices in pharmaceutical installations provides a variety of insights, which gives rise to problems in the medicine supply chain cycle which impact the availability of medicines and medical devices, resulting in poor quality and efficacious health services. The large budget value for medicines and medical devices is around 40%, which provides special attention in monitoring the management of medicines and medical devices (Quick, 2012).

Problems that arise in the management of drugs and medical devices are influenced by internal and external factors in the hospital, so supervision and control over the supply chain of drugs and medical devices is needed for quality control and cost control. Therefore, a special section is needed with the task of evaluating drug management. sick in accordance with applicable procedures as appropriate (Rachmat & Putra, 2017).

Evaluation is a form of activity that gives value to the quality of something and is defined as a systematic process in making decisions until organizational goals are achieved. Performance evaluation provides very important feedback about the individual in socializing within the organization (Gibson et al., 2011). This performance evaluation system has a very important function for human resource management, because if it is not communicated well, this will have a big influence on achieving company goals (Wijayanti & Wimbarti, 2012). Evaluation is carried out to provide an assessment of the work results or work achievements obtained by an organization, team or individual. Evaluation will provide feedback on organizational goals and objectives, as well as on organizational planning and processes (Wibowo, 2016).

The aim of this research is to find out the results of the evaluation of drug management at RSAM and to prepare recommendations regarding the results of the evaluation of drug management at Anwar Medika Hospital based on fishbone, CARL and PEARL method analysis. This research is expected to provide alternative solutions to problems related to the process of implementing drug management evaluation and provide information, descriptions and consideration for performance evaluation policy makers.

Method

The research method used is descriptive qualitative and quantitative verification. The descriptive method aims to make an accurate analysis based on systematic facts in a particular place using questionnaires and interviews to make generalizations.

The instrument used in the research was interviews with research subjects with a checklist as the research instrument. The subject of the research is evaluation of drug management at the selection, planning and procurement stages at RSAM. The population in this study were employees of the RSAM Pharmacy Installation and all documents/data from the Pharmacy Installation services. Meanwhile, the samples in this study were pharmacists, heads of service rooms, and heads of logistics and sample data in the form of documents/data on selection, planning, procurement, receiving, storage, distribution and use of medicines at the RSAM Pharmacy Installation.

Primary data collection methods were direct interviews and answers from the drug management evaluation checklist. Secondary data from selection: hospital drug formulary, prescription writing data, drug list from the pharmaceutical industry. Planning stage: drug expenditure data, planning team, planning basis, planning method, clinical pathway. Procurement stage: amount of funds used for procurement, collaboration with suppliers, procurement methods, organizational structure of the procurement section, RI LKPP Regulation Number 6 of 2020. Reception stage: data on invoices received, order letters, signatures and date of receipt of the medicine. Storage stage: stock card data, empty medicine list, stock taking data. Distribution stage: purchase invoice. Use stage: drug stock data, prescriptions, non-formulary drug data.

The data analysis technique in this research is using descriptive descriptive analysis based on interviews. Analysis by combining primary data with secondary data. Data is described, arranged into patterns, and provides conclusions. In qualitative research, it takes the form of evaluating drug management at the stages of selection, planning, procurement and presenting it in tables. The evaluation results were followed up using fishbone, PEARL, and CARL. It is hoped that this conclusion can become a recommendation for RSAM.

Results and Discussion

Selection Stage

In the initial stage of pharmaceutical service management, it begins with selection activities, where this activity is an examination of treatment needs in pharmaceutical services which is used to determine optimal therapy, with good form and dose, by selecting standard drug references listed in the national formulary, and using essential drugs and generic drugs as the main drugs in therapy, selecting drugs that are in accordance with the formulary. The indicator used in conducting evaluations at the selection stage based on WHO is the percent of hospital formulary drugs that are in accordance with the National Formulary. The selection stage requires data on the number of hospital formulary drug items and the number of drug items according to FORNAS.

Table 1. Selection Stage Evaluation Results

Selection Data	Unit	Evaluation result
Number of Formulary drugs	Items	1,004
Amount of medication according to FORNAS	Items	736

Based on the evaluation results, it was found that the percentage of hospital formulary drugs that were in accordance with FORNAS was 73.31%, where this result was below the desired target of 100%. This could happen due to the influence of the demand for non-formulary medicines provided by medical personnel which is quite high considering the patient's condition. This is the same as research conducted by (Saputera, 2014) which stated that the evaluation of the selection stage for pharmaceutical services at Hasan Basery Hospital did not meet the target because the selection stage was carried out every year and involved medical and supporting personnel. Another study conducted by (Handayani & Hamzah, 2017) stated that the choice of drug type is not always the same every year because disease cases are 48 and patient visits are unpredictable.

Planning Stage

At the planning stage, the main problem discussed is the percentage of the number of drug items received in accordance with the number of drug items planned for the same period, which means that the number of drug items received is the same as the number of drug items planned for the same period.

Table 2. Evaluation Results of the Planning Stage

Planning Data	Unit	Evaluation result
Budget allocation	Rupiah	21,396,177,981
Realization of funds	Rupiah	22,371,076,800
Number of plans	Seed	9,552,753
Quantity used	Seed	7,944,326
Number of grant drugs	Seed	5,700

Based on these calculations, it shows that the absorption of drug planning funds is 104.56% and the percentage of planning compared to usage is 120.32%. This happens because in 2021 RSAM is still serving patients diagnosed with Covid-19, where the number of patients and the number of drug plans cannot be estimated, so the absorption of funds for drug planning exceeds the allocated funds provided. In line with other research which states that drug planning always changes because patient visits cannot be predicted (Handayani, 2017). (Ningsih et al., 2018) in her research stated that planning for drug needs at Kartika Pulo Mas Hospital has not gone well so that there are still shortages of drugs, a Pharmacy and Therapy Committee has not been formed, and a formulary has not been prepared. This data is used for consideration by the Pharmacy and Therapeutics Committee whether to add or not add it in planning for the next period. Drug items that are usually not planned occur due to the need for these drug items

taking into account the patient's condition based on recommendations medical committee implemented by the Pharmaceutical Therapy Committee.

Procurement Stage

At this stage regarding procurement efficiency, the problem focuses on drug prices, where the calculation is by comparing the average drug price for each drug item when compared with the e-catalogue price as determined by the government.

Table 3. Procurement Evaluation Results

Procurement Data	Unit	Evaluation result
Average price	Rupiah	1,231.2
The average price is set by the government	Rupiah	969
Amount received		
Planned amount	Seed	8,511,667
	Seed	9,552,753

The first indicator used to measure procurement efficiency is the ratio of the average price of medicines obtained to the price set by the government (e-catalog). Data taken from BPJS Chronic drug claims. The price of chronic BPJS medicines charged for 92 medicine items is IDR. 225,268,177, while the price of the medicine is paid according to the e-catalog price of Rp. 177,349,427,-. The average purchase price obtained was Rp. 1,231.2 per unit, while the average acquisition price for e-catalog drugs per unit is Rp. 969, so the average drug price ratio is 1.27. This is because the procurement of medicines for JKN patients is not carried out via e-purchase, so the purchase price obtained is higher than the e-catalogue even though there are some drugs that get e-catalogue prices through direct ordering. In line with research by (Rokhmani, 2017) which states that hospitals do not have access to provide Fornas medicines online, there are Fornas medicines that are not displayed in the e-catalog, the launch of the e-catalog is late, several Fornas medicines are out of stock at distributors and also Some of the empty Fornas medicines were substituted with regular medicines, thus affecting the cost of the INA CBGs package that had been determined and the excess costs were borne by the hospital.

Acceptance Stage

The drug receipt stage is the supplier's role in fulfilling drug requests and orders. At this stage there are three indicators used to measure supplier performance, namely (1) Percent of drug orders sent according to the order letter (2) Percent of drug orders that arrive before the agreed lead time; (3) Average lead time for drugs to arrive; (4) Percent of product batches that have been tested to meet national or international quality standards.

Table 4. Evaluation Results of the Acceptance Stage

Receipt Data	Unit	Evaluation result
Order quantity	Seed	9,552,753
Quantity as ordered and on time	Seed	6,809,334
Number of mail orders sent	Sheet	4,220
The invoice amount comes		
Invoice amount according to order letter	Sheet	7,275
The number of drug orders sent before the specified deadline	Sheet	6,658
Number of suppliers over time	Seed	4,577,574
Number of suppliers		8
Number of drug items that meet quality control standards		27
Number of hospital formulary drug items	Items	1,004
	Items	1,004

One part of the drug receipt stage that is used to evaluate drug management is to always monitor or control the quality of each drug. The indicator used is the product batch number which has been tested to meet national and international quality control standards as indicated by a distribution permit from BPOM. The target of this indicator is 100% where the way to measure it is to compare drugs that have a batch number that has been tested compared to the number of drugs received. Based on observation of documents in the field, it is known that all drugs received have batch numbers with distribution permits, so it can be seen that this indicator is in accordance with the target.

Storage Stage

The storage stage is one part of pharmaceutical management. At this stage several things are needed to evaluate pharmaceutical management. There are 4 activities carried out at this stage, namely (1) Management control by evaluating the percentage of accuracy in submitting inventory reports per service unit, (2) Percent of drug loss, (3) Minimum stock level by calculating the minimum stock percentage, (4) Availability of drugs by calculating percent drug emptiness. The data needed to evaluate this storage stage are: (1) Number of service units; (2) The number of service units that submit inventory reports according to schedule and precisely; (3) Value of drug inventory from drug stock taking; (5) Value of drug

inventory from the system; (6) Number of drug items; (7) The number of drug items is below the minimum stock; (8) Number of empty drug items.

Table 5. Storage Stage Evaluation Results

Storage Data	Unit	Evaluation result
Number of service units	Units	38
The number of units submit inventory reports according to schedule	Units	30
Stock taking inventory value		
System inventory value	Rupiah	4,206,309,694
Number of drugs < minimum stock	Rupiah	4,158,554,765
Number of outpatient pharmacy medications	Items	92
Number of inpatient pharmaceutical medications	Items	421
Number of ED pharmacy medications	Items	452
Number of IBS pharmaceutical drugs	Items	353
Number of outpatient pharmacy empty drugs	Items	52
Number of empty inpatient pharmacy drugs	Items	52
Number of empty medicines from the emergency room pharmacy	Items	19
Number of IBS pharmacy blanks	Items	47
	items	8

Based on these calculations, the results showed that outpatient pharmacy depots experienced 12.35% out of drug stock, inpatient pharmacy depots experienced 4.2% out of drug stock, emergency room pharmacy depots experienced 13.31% out of drug stock, while the pharmacy depot at IBS (Central Surgical Installation) as much as 15.38%, this occurs because drug shortages in logistics and stock monitoring at pharmacy depots are not optimal and system drug stock information does not match the physical number of drugs. This is in line with (Simanjuntak, 2020) statement which states that an adequate inventory information system will influence the elements of inventory management. Based on these four indicators, it can be seen that drug management at the storage stage does not comply with standards.

Distribution Stage

The distribution stage is one part of drug management at the RSAM Pharmacy Installation. At this stage, an indicator of the percent suitability of drugs

distributed by the logistics unit to each service unit is used between request and delivery. The data required are: (1) Number of request sheets from the service unit; (2) The number of drug delivery sheets in accordance with the service unit's request. The hope from this stage is to achieve a target of 100%.

Table 6. Distribution Stage Evaluation Results

Distribution Data	Unit	Evaluation result
Number of request sheets	Sheet	12,910
Number of sheets sent according to request	Sheet	12,661

Based on the calculation results, it shows that drug delivery is in accordance with service unit requests of 98.07%. This happens because manual monitoring carries the risk of drug shortages. This is because the monitoring carried out is still manual and the management information system (SIM) is not optimal, this is in line with research conducted by Oktaviani (2018) which states that the accuracy of drug quantity data does not match the physical quantity of medicines with stock cards, this is It can be said that administration in the warehouse has not been carried out optimally and efficiently because the Management Information System (SIM) used is not optimal so that warehouse officers need a long time to match stock and physical drugs through the system, sometimes officers choose to use manual methods..

Use Stage

At the use stage the focus is on rational prescribing, which uses three indicators, namely (1) Percentage of the amount used of the total amount available for consumption after deducting buffer stock (initial balance plus amount purchased plus amount donated minus buffer stock) during the specified period determined; (2) Percentage of patients who receive medication according to FORNAS; (3) Percentage of compliance in writing prescriptions according to the Hospital Formulary (4) Percent of patients who do not take medication. Each indicator has different measurements and targets so that it provides different results and analysis. The data needed to evaluate the use stage are: (1) The number of drugs used; (2) The amount of drug inventory ready for use minus buffer stock; (3) Number of patients treated according to FORNAS; (4) Number of patients treated; (5) Number of drugs outside the hospital formulary; (6) Total prescription writing; (7) Number of patients who did not take medication.

Table 7. Usage Phase Evaluation Results

Usage Data	Unit	Evaluation result
Amount of medication used	Seed	7,944,326
The amount of ready-to-use drug inventory minus buffer stock	Seed	8,823,125

The number of patients treated according to FORNAS	Person	210,538
Number of patients treated		
Number of drugs outside the formulary	Person	288,816
Total prescription writing	Items	78
Number of patients not taking medication	Items	935,754
	Person	36

The first indicator is the percentage of drug use compared to the number of drugs available, which is 90.04%, this causes stock buildup (over stock) which carries the risk of forgetting to use and expiring drugs. This can happen because of the pandemic which requires hospitals to provide Covid-19 therapeutic drugs, whereas in the middle of 2021 Covid-19 sufferers have greatly reduced due to the success of administering the Covid-19 vaccine to the community. Another reason is that geographically the hospital is far from urban areas with a lead time of more than 2 x 24 hours, so to avoid vacancies, additional drug stock is added in excess of drug use. The second indicator concerns the percent of patients who receive medication according to the Hospital Formulary. amounting to 72.9%. This happens because of the patient's clinical condition so the doctor prescribes drugs outside the formulary with approval from the Medical Committee and the Pharmacy and Therapeutics Committee. Other research states that the distribution of medicines according to prescriptions has not been fully served due to the writing of prescriptions and the availability of medicines that do not comply with the formulary (Handayani, 2017). The third indicator regarding writing drug prescriptions outside the hospital formulary, showed 0.008%, while the percentage of prescription compliance was 99.992%. This happens because some medical personnel are only willing to prescribe drugs from certain brands. The fourth indicator concerns the number of patients who do not take the medication prescribed by the doctor. This indicator is used to determine the compliance of patients who come for treatment whether they want to take medication or just have an examination. Based on the calculation results, it is known that only 0.012% of patients did not take medication. This happens because the patient has to wait too long for the medicine, the patient cannot afford the medicine, the medicine is not available at the pharmacy.

Fishbone, PEARL, CARL

Based on the results of the evaluation of drug management at the RSAM Pharmacy Installation, problems were then identified through FGD (Focus Group Discussion) with the respondents. From several selected problems, the cause of the problem was identified using fishbone followed by CARL. Analysis of the causes of problems using fishbone is composed of five things, namely man, machine, money, material, method. Each of these elements is then broken down into problems that arise from pharmaceutical services at the RSAM Pharmacy Installation. Based on the results of the FGD, 3 (three) main problems were

found, namely (1). Non-compliance with writing prescriptions according to the Hospital Formulary, (2). The supplier does not comply with the cooperation contract, (3). Stock management is not optimal either manually or systemically. From these 3 (three) problems, root cause analysis was then carried out using a fishbone diagram

Compliance with writing prescriptions according to the formulary was chosen as the cause of the problem because non-compliance with writing prescriptions according to the formulary has an impact on patients, namely patients do not get medicines according to the formulary, medicines are not available at the Pharmacy Installation, patients do not get medicines quickly, there are efforts to fulfill the need for these medicines by making purchases at pharmacy or partner hospital. The root of the problem of non-compliance with writing prescriptions according to this formulary is that a new hospital formulary has not yet been formed, a list of formulary drugs is needed to make a formulary book, the users of this formulary book are medical personnel (Doctors), socialization of the formulary book has not been optimal to all medical personnel and JKN medicines have not been purchased through e-purchasing.

The second problem is suppliers who do not comply with cooperation agreements. This problem was chosen because suppliers' non-compliance with this cooperation agreement has an impact on drug shortages, delivery delays, drug price discrepancies, thereby hampering health services to patients. The root of the problem that causes this problem to occur is because the rights and obligations of each party are not yet detailed, there are no sanctions for parties who violate the cooperation agreement regarding the availability of goods and delivery schedules, supply chain management that has not been implemented properly, there are delays in payment of receivables. and there are delays in financial reports

The next problem chosen is inventory stock that is not running optimally either manually or systemically. This problem was chosen because it has an impact on the availability of drugs, drug stocks are often empty, distribution systems are disrupted, stock is lost, drugs are forgotten to be used, the risk of expiration which affects the value of drug supplies. The root of the problem that causes this problem to occur is because the stock card is not run optimally, the management information system (SIM) has not been able to describe the latest stock (update), lack of pharmaceutical resources both quantitative and qualitative, lack of IT resources that can operationalize and understand SIM, stock monitoring is less than optimal, which results in the number of drug stocks and the value of drug supplies.

The CARL weighting results according to respondents considered that Leverage was the most important component. It is hoped that the root problems that greatly influence other problems can be identified through CARL calculations. The CARL value that has been obtained is then calculated further to determine the scale of the problem. The calculation is carried out by multiplying the CARL value with the predetermined weight. The multiplication results obtained are then used to determine the ranking of a problem to be solved.

The problem of non-compliance with writing prescriptions according to the Hospital Formulary is at the root of a very influential problem, namely the hospital formulary. Other research shows that there is a discrepancy in writing prescriptions with the formulary because the Hospital Formulary has not been updated (Oktaviani & Pamudji, 2018). In the second problem regarding suppliers not complying with cooperation contracts, it is known that the problem of drug shortages at distributors is a very influential root of the problem. Meanwhile, the third problem regarding stock management is not optimal, both manually and systemically, it is known that the main root of the problem is human resources in the pharmaceutical installation. The next step in this research is to calculate the total value of each problem so that the total value of each problem can be known. The total CARL which is the product of the CARL value and the weighting value is known for each value for each existing problem. The results of CARL's total calculation show that the hospital formulary has not yet been established as the cause of the problem of non-compliance with writing prescriptions according to the Hospital Formulary. In the second problem regarding suppliers not complying with cooperation contracts, it is known that the problem of drug shortages at distributors is the main factor, while the lack of pharmaceutical human resources, both quantity and quality, is the main cause of suboptimal drug stock management, both manually and systemically. In line with research by (Bachtiar & Germas, 2019) which states that achieving good drug management requires an analysis of training needs for pharmaceutical human resources related to drug management.

Based on calculations, it shows the priority of alternative solutions that have an influence on solving other problems, namely: increasing the number of pharmaceutical human resources in the problem of pharmaceutical human resources aimed at improving monitoring, supervision and better management of medicines, in hospital formulary problems, creating formulary e-books which are placed in all computers for all work units to be easily accessed by all parties, especially medical personnel, while changing the procurement method to the EOQ (Economic Order Quantity) method is expected to solve problems related to drug stock availability. The implementation of these alternative solutions continues to be monitored and evaluated regularly so that all problems can be resolved so that drug management can run well.

Conclusion

Drug management at the RSAM Pharmacy Installation has been implemented but is not yet in accordance with drug management standards from the BPK, WHO and Minister of Health Regulation Number 72 of 2016 2. The recommendations given to the hospital regarding the results of the evaluation of drug management at RSAM using the fishbone, CARL and PEARL methods are firstly increasing the number of Pharmaceutical Human Resources in the Pharmacy Installation, followed by creating an e-book formulary which is placed on all work unit computers, and finally, namely changing the planning and procurement system using EOQ (Economic Order Quantity)..

Acknowledgments

The author would like to thank the supervisor, main director of PT. RSAM, director of Anwar Medika Hospital, pharmacy officer at Anwar Medika Hospital and friends in the pharmacy department class of 2019.

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