

# EVALUATION, REMEDY OF WASTE, LEAN HOSPITAL METHOD, PROCESS OF INPATIENT PHARMACY SERVICES IN HOSPITAL

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*Lean Hospital;  
Pharmacy  
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**ABSTRACT**

*Each installation in the hospital must continue to evaluate, improved, and developed, including the pharmacy installation. As one of the medical support services in hospitals, pharmacy installations are required to continuously improve the quality of their services. This study aims to see the root of the problem and provide evaluation and improvement for the reading of critical waste in the inpatient pharmacy service process of Kabupaten Karanganyar Hospital. This study used a non-experimental research design and was descriptive and qualitative. Data techniques in qualitative and quantitative research. The value of patient data was obtained from distributing questionnaires. The pharmaceutical service process was obtained from observation and document review, then mapping in value stream mapping. The determination of waste was obtained from distributing questionnaires and in-depth interviews with the five why method. The research results show that critical waste in inpatient service in pharmacy installation is a waste defect and waste waiting. The root cause of critical waste is the prescription of drugs by doctors outside the formulary. The root cause of waiting for waste is a prescription from hospital admission simultaneously. The proposed improvement for the cause of critical waste is Monitoring and evaluating the implementation of the formulation on a going basis, providing special software to enter patient data, and implementing the use of electronic prescribing to shorten the service process time.*

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## INTRODUCTION

Hospitals are one of the health service institutions that have an essential role in improving public health, so hospitals are challenged to become health services that are easily accessible, accessible, safe, thorough, efficient, and cost-effective (Poksinska, 2010). The increasing number of hospitals requires that the function of hospital services be gradually improved to provide satisfaction to patients, families, and the community (Kemenkes RI, 2009). Hospitals must provide quality services per established standards

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and can reach all levels of society (Kemenkes RI, 2008). Quality service means providing services to patients based on quality standards to meet their needs and desires to obtain satisfaction that can ultimately increase patient trust and will be loyal to the hospital (Sari, 2020).

One way to provide good service to consumers can be realized if the hospital can manage the resources available and maximize them (Grabana, 2016). A service is said to be suitable for the patient if the services provided can meet the patient's needs, using the perception of the service received. Satisfaction starts from the service to the patient from when the patient first arrives until the patient leaves the hospital (Novitasari et al., 2014). Quality in health services consists of consumer quality, professional quality, and management quality (Munawarah et al., 2020).

Each installation in the hospital must continue to evaluate, repaired, and developed, including pharmaceutical installations. Pharmacy installation is part of the supporting service unit. Besides that, it is also the last unit that can determine patient satisfaction with hospital services, so the good and bad of the services provided will affect the related service units so that they are required to improve the quality of their services in a continuous manner (continuous improvement) because it has a considerable contribution to the management of pharmaceutical supplies to the quality of service and hospital income.

One of the management methods or principles that can be applied in hospitals to achieve quality services is to use the lean concept (Grabana, 2016). Implementing management improvements in hospitals aims to reduce errors in implementing health services in an installation to improve the quality of services in hospitals. Lean hospitals are needed to optimally meet patient needs and provide the maximum possible health services by reducing waste or waste to create added value for the hospital. Hospitals in Indonesia that have successfully implemented lean, namely RSIA (Mother and Child Hospital) Kemang Medical Care, has succeeded in reducing the number of drugs in the perinatal unit by 58% from 90 items to 38 items, and for six months of the implementation of a lean hospital can save monthly costs of Rp. 90,524,887 (Oktaviati, 2021). Implementing lean management can reduce the waiting time for the repatriation process of inpatients at Panti Waluyo Surakarta Hospital. The average waiting time for the repatriation process of inpatients at Panti Waluyo Hospital has decreased significantly from 3 hours 10 minutes to 2 hours 14 minutes (Sakit et al., 2019).

The local government of Karanganyar Regency owns Karanganyar Regency Hospital. It is a type C hospital with several medical service facilities, one of which is inpatient services, where patients undergo a treatment process by health professionals. Problems at Karanganyar Regency Hospital still have obstacles in providing services derived from service procedures, patient satisfaction, quality of employees, and officers' role in helping patients.

Based on the background above, it is necessary to make improvements to improve the quality of service at Karanganyar Regency Hospital using the lean hospital method, thus encouraging researchers to conduct research with the title "Evaluation and Improvement

of Waste with the Lean Hospital Method in the Service Process at the Inpatient Pharmacy Installation of Karanganyar Regency Hospital".

### **Research purposes**

This study aimed to determine the critical waste in the service process at the Inpatient Pharmacy Installation at the Karanganyar Regency Hospital. Knowing the root causes of critical waste problems that occur in the service process at the Inpatient Pharmacy Installation of the Karanganyar Regency Hospital and providing evaluations and suggestions for improvements using the lean hospital method to minimize waste that occurs in the service process at the Inpatient Pharmacy Installation at the Karanganyar Regency Hospital.

### **Benefits of research**

Based on the formulation of the problem and research objectives, the benefits that can be obtained from this research are:

#### ***For Karanganyar District Hospital***

As a consideration for hospitals in using the lean hospital concept to be applied in hospital management.

#### ***For the management of Karanganyar District Hospital***

As the material for consideration or input for improvement, development, and improvement in improving the service process using the lean hospital method so that it can contribute to improving the quality of service at the hospital.

#### ***For Society***

Hopefully, this will provide additional insights and information and a deeper understanding of lean hospitals.

### **METHODS**

This study uses a non-experimental research design and is descriptive qualitative. This study aims to determine the waste that occurs in the inpatient Pharmacy service process at the Karanganyar District Hospital, and it is hoped that the results of this study can become an evaluation and recommendation to improve the service process at the Inpatient Pharmacy at the Karanganyar District Hospital. The data collection techniques in this study were qualitative and quantitative. Qualitative data were obtained by means of observation, interviews and document review, while quantitative data were in the form of numbers obtained from the results of distributing questionnaires. The data obtained was carried out descriptive analysis as a material consideration in the process of designing improvement proposals. The subjects in this study were 13 inpatient pharmacy officers consisting of 2 pharmacists and 11 pharmacy technicians (TTK) as well as inpatients who were undergoing treatment at class III inpatient wards at Karanganyar District Hospital.

This research was conducted at the inpatient pharmacy outlet of the Karanganyar Regency Hospital which is located at Jl. Rear Admiral Yos Sudarso, Bejen, Karanganyar. When the research was carried out in October-December 2020. The population in this study were all inpatient pharmacy installation staff and inpatient BPJS patients who were undergoing treatment at the class III inpatient ward at the Karanganyar Regency Hospital.

## **RESULTS AND CONCLUSIONS**

Before carrying out the research, the preparations made by the researcher were as follows: submitting a research permit on September 24, 2020, for the Administrative Section of the Faculty of Pharmacy, Setia Budi University, which was addressed to the Director of the Karanganyar Regency Hospital. The Faculty then issued this research permit on September 25, 2020, with attachment number 042/D3-04/25.09.2020, which can be seen in (attachment 1). On September 28, 2020, the researcher submitted a research permit and research proposal to the Administrative Section of the Karanganyar Regency Hospital. On October 26, the researcher consulted with the Education and Research Department of the Karanganyar District Hospital regarding the administrative requirements that must be met in connection with the procedure for conducting research at the Karanganyar District Hospital, which was then forwarded to the medical record department, pharmacy installation, and class III inpatient ward.

### **Results of the Validity and Reliability Test of the Patient Value Questionnaire**

#### ***Validity test***

Based on the results of validity testing using the reproducibility coefficient formula (Kr), a value of = 1 is obtained, and the scalability coefficient (Ks) obtains a value of = 1 can be seen in (appendix 4). The instrument is highly valid if the reproducibility coefficient is  $\geq 0.90$  and the scalability coefficient is  $\geq 0.60$  (Singarimbun & Effendi, 1989). The conclusion from the results of validity testing is that the questionnaire used in this study has very high validity, which means that the questionnaire is declared valid and can be used as a data collection tool in this study.

#### ***Reliability test***

Based on the results of testing the reliability of the questionnaire using the Kuder-Richardson formula (KR-20) can be seen in (appendix 6), the reliability value (KR-20) is 0.6441. Under the reliability criteria, according, the reliability coefficient is in the range of 0.60-0.799, which is included in the substantial criteria, so it can be concluded that the reliability value of 0.6441 is acceptable and can be used as a data collection tool in this study.

### **Patient Value of Inpatient Pharmacy Installation at Karanganyar District Hospital**

Collecting value data of inpatient pharmacy installation patients by distributing patient value questionnaires to 30 respondents, namely patients or patient families, based on the criteria determined in this study, namely patients currently undergoing treatment

in class III inpatient wards, at least 17 years old and able to write and read. The patient value questionnaire used in this study used the same questionnaire from previous research conducted by Nancy (2014) entitled "Lean Hospital Approach for Continuous Improvement in the Process of Pharmacy Installation Services at Bethesda Hospital, Yogyakarta).

The value questionnaire in this study aims to identify what values patients desire for inpatient pharmacy services at Karanganyar District Hospital. According to Gasperz (2007), one of the lean principles is to identify product value based on a customer perspective, where customers want quality products at competitive prices and timely service. In order to satisfy customers or patients as recipients of health services in hospitals, it is necessary to identify in advance what are the wants, needs, and expectations of customers or patients so that the sacrifices made by customers are comparable to those obtained from inpatient pharmaceutical services at the Karanganyar Regency Hospital. The results of the recap calculation of the value questionnaire for inpatients at the Karanganyar Regency Hospital can be seen in the following table:

**Table 1. Recapitulation results of the value questionnaire calculation in terms of product**

Statement type		Yes (%)	No (%)
A. Products			
1	The quality of medicines and medical devices received is considered important	100	-
2	The accuracy of the drugs and medical devices received is considered important	100	-
3	The completeness of medicines and medical devices received is considered important	100	-
4	Brands of drugs and medical devices provided by the pharmaceutical installation are considered important	96	4
5	Labels or labels for medicines and medical devices received are considered important	100	-
6	Packaging or packaging of drugs and medical devices received is considered important_	90	10

Based on table 1, it can be seen that the results of calculating the patient value questionnaire in terms of product show that four values have absolute value (100%), namely the value of quality, accuracy, completeness, and labeling or labeling of drugs and medical devices. This shows the patient expects value from the inpatient pharmacy's services at Karanganyar District Hospital. The percentage results regarding drug and medical device brand statements received by patients were 96%, and the percentage results for statements that considered it unimportant or did not want this value were 4%. The percentage results from statements on the packaging or packaging of drugs and medical devices desired by patients are 90%, and the percentage results from statements that consider it unimportant or do not want this value are 10%.

**Table 2. The results of the recap of the calculation of the value questionnaire in terms of service**

Type of statement	Yes (%)	No (%)
<b>B. Service</b>		
1 The speed of obtaining needed medicines and medical devices is considered important	100	-
2 The expertise of officers in answering and conveying drug information is considered important	100	-
3 When the officer visits the treatment room to meet the patient is immediately considered important	100	-
4 The accuracy of the information on drugs and medical devices received is considered important	100	-
5 Complete information on drugs and medical devices received is considered important	100	-

Based on table 2, it can be seen that the results of the calculation of the patient value questionnaire in terms of services provided by the inpatient pharmacy of Karanganyar Regency Hospital show that the value of absolute value (100%) is the speed of obtaining medicines and medical devices, the expertise of officers in answering and conveying information, the time of the officer's visit to the treatment room, as well as the accuracy and completeness of the pharmaceutical supply information expected by the patient when receiving services from pharmaceutical installation of Karanganyar Regency Hospital.

**Table 3. Recapitulation of the results of calculating the value questionnaire in terms of the patient's relationship with the inpatient pharmacy installation**

Type of statement	Yes (%)	No (%)
<b>C. The patient's relationship with the inpatient pharmacy installation</b>		
1 The friendliness of the staff in providing services is considered important	100	-
2 Officers wear neat clothes when providing services considered important	93	7
3 Pharmacy installations must understand my condition and needs regarding medicine and medical devices	100	-
4 Ease of contacting pharmacy officers or installations (by telephone, etc.) is considered important_____	96	4

Based on table 3, it can be seen that the results of calculating the patient value questionnaire in terms of the relationship between the patient and the inpatient pharmacy at the Karanganyar Regency Hospital show that the absolute value (100%) is the friendliness of the staff in answering and conveying information and responding to patient

needs regarding the pharmaceutical supplies received and expected by the patient. Meanwhile, the percentage of officers who dress neatly dressed when providing services is 93%, and the percentage of statements that consider it unimportant or do not want this value is 7%. The percentage results regarding the ease of contacting pharmaceutical officers or installations (by telephone, etc.) are 96%, and the results of statements that consider it unimportant or do not want value are 4%.

Show that the absolute value of inpatients (100%) is 6, namely the value of quality, accuracy, and completeness of pharmaceutical supplies, as well as the accuracy and completeness of information on pharmaceutical supplies received by stakeholders, plus the friendliness of pharmacists and staff in giving service. Many factors can affect patient satisfaction, one of which is the quality of services provided by the hospital.

Service quality is one way that can be used to fulfill user desires that are free from deficiencies so that they can provide satisfaction for service users. Patients, as service users, always demand service providers or services to fulfill all their needs by providing the best service. Karanganyar Regency Hospital, as a health service provider, is required to continue to improve and pay attention to the quality of health services provided. Implementing lean hospitals can provide a perspective, especially for medical staff, to create better service capacity and establish new rules and more effective service delivery methods (Papadopoulos, 2011). The use of lean, especially in health services, has the goal of removing activities that do not provide added value (non-value added) from the process so that each activity in the process provides added value (value added) from the patient's perspective.

The researcher provides additional columns that respondents can fill into the questionnaire if necessary things have yet to be mentioned regarding products, services, and patient relationships with the inpatient pharmaceutical installation of the Karanganyar Regency Hospital. Based on the questionnaire results, respondent number 2 said "about the hours of drug administration to patients," and respondent number 26 said that adding the function of drug administration and drug side effects was necessary. Drug information services are an integral part of the implementation of pharmaceutical services in hospitals, one of which is for inpatients who need special attention. Health services are required to provide services according to standards, so it is necessary to determine whether the inpatient is satisfied. To health services (Kurniawan et al., 2016). There is a significant relationship between providing drug information and patient satisfaction. Customer satisfaction will lead to customer loyalty to hospital services resulting in repeated purchases or reuse, with the identification of value from the patient's point of view so that the Karanganyar Regency Hospital as a service provider can meet the needs or desires of patients as service users (Sulo, 2020).

### **Value Stream Mapping and Value Added Assessment of Service Processes in Inpatient Pharmacy at Karanganyar District Hospital**

*Value stream mapping* (VSM) is an overview of service activities from the patient requests until the request is fulfilled. The determination of VSM in this study aims to

determine the activities included in *value-added* and *non-value-added* activities throughout the service process (*value-added assessment*). During the observation, the researcher identified the time at each process stage during the service.

The time data identified in this study include CT (*cycle time*), VA (*value-adding time*), NVA (*non-value-adding time*), VAR (*value-added ratio*), and LT (*lead time*) data. CT is the time used to complete one service process cycle or stage. VA is the time spent working on a process or activity that adds value or is helpful to the patient. NVA is the time spent working on a process or activity that does not add value or is unwanted by the patient. VAR is the ratio of comparing the total *value-adding time* with the total *cycle time*. LT is the time used to complete a service process from the first stage to the last stage, or it can be said that the lead time is the accumulation of the total *cycle time* (Putra, 2023).

Process (VSM) *value stream mapping* This study describes several stages, namely, stage 1 and stage 2. These stages describe the flow of the service process at the inpatient pharmacy outlets of the Karanganyar Regency Hospital based on standard operating procedures and observation results. The description of the stages in the service process at the inpatient pharmacy outlets of the Karanganyar Regency Hospital is as follows:

### ***The first stage***

This first stage includes the nurse from the treatment room entering the prescription into the inpatient pharmacy outlet. The pharmacist receives and signs the prescription handover book. The prescription is separated between the prescription for inpatients, which consists of daily dispensing and new patients and patients going home. The pharmacist writes down the delivery time and the number of prescriptions at the inpatient pharmacy outlet. Next, the pharmacy officer conducts a prescription review, including an assessment of administrative, pharmaceutical, and clinical requirements. Administrative screening includes the patient's name, patient's age, patient's gender, medical record number, patient's address, name of the examining doctor, doctor's license, examination date, and doctor's signature or initials. Pharmaceutical screening includes, among other things, dosage form, strength or dosage, amount of drug, stability and availability, rules for use, method of use, and exact time of administration. The clinical screening included the suitable indication, the correct dose, duplication, allergies, drug interactions, and contraindications. The officer put a check mark yes or no at each review point and put initials in the prescription review column. Suppose there are problems or ambiguities when conducting a prescription review. In that case, the pharmacist must communicate this to the doctor and write down the recommendation or confirmation from the doctor on the prescription review sheet (Susiloningtyas, 2020).

Prescriptions that have been reviewed are submitted to the prescription data entry officer. For prescriptions with guaranteed patients, a check is made to check the similarity of the patient's identity written on the prescription with that written on the SEP. Then the data entry officer opens the SIMERSI application and enters the patient's medical record



number data to bring up the patient's identity data. Then the officer checks the data that appears monitored with the identity data on the patient's prescription, including the suitability of the treatment room. If there is a discrepancy, the pharmacy officer immediately contacts the treatment room officer to ensure the correctness of the data. If the identity data is correct, the officer continues data entry, including the name and amount of drug given, then the officer re-checks the entry results.

### ***Second stage***

This second stage starts when officers serve pharmaceutical supplies according to doctor's orders in prescriptions. Setup on UDD recipe (*unit dose dispensing*) Oral drug packaging is packed in plastic with different labels, namely "morning" for morning, "afternoon" for afternoon, "afternoon" for evening, and "evening" for the night. As for the packaging of injection drugs or ampoules (vials) are packaged in separate plastics. Then the pharmacy officer conducts a final screening. Namely, the officer gives labels for all pharmaceutical supplies that have been prepared. At the end of the process, the officer conducts a drug review or matches the prepared pharmaceutical supplies with those written on the prescription. The drug review carried out by officers included the first, namely whether the drug was prepared according to the prescription, the second, whether the dose given was appropriate, the frequency of administration, the route of use, and the exact patient. After that, the pharmaceutical supplies that have been prepared are put into medicine bags and grouped into the wards and then taken by transporters to be handed over to the inpatient ward (Adrizal et al., 2019).

Based on the results of VSM (*value stream mapping*) in the non-concoction recipe service process, Figure 4 shows the total obtained *lead time* (LT) for the service process of the 30 non-concoction prescriptions studied, namely 3918 seconds or 65 minutes, the lead time is the time spent getting the complete service from the receipt of the prescription to the inpatient pharmacy outlet until the prescription is completed, with a VA: NVA value ratio of 21, 2 minutes:43 minutes and VAR values (*value added ratio*) of 32.6%, the calculation results can be seen in (appendix 13). VAR (*value-added ratio*) at the end of the VSM measures the efficiency of the process, namely the percentage of value-added time compared to the total time to complete the process. The higher the VAR value, the more significant the portion of the activity that is added value or desired by the patient compared to the waste in a service process. Perusahaan dikatakan *lean* apabila nilai rasio antara *waste* dengan total aktivitas telah melebihi 30%. Based on the results obtained, shows that drug prescription service activities at inpatient pharmacy outlets are included in the category *lean*. This shows that the service process at the inpatient pharmacy outlets of the Karanganyar Regency Hospital is quite good. However, there are still high activities that are wasteful which must be immediately identified and minimized, so it is necessary to apply the method of *the lean hospital to reduce or eliminate non-value added activities (waste)*, to shorten service processing time and add value to patient satisfaction to increase effectiveness, efficiency, and quality of service at inpatient pharmacy outlets at Karanganyar District Hospital.

## CONCLUSION

Based on the study results, *waste* critical to the service process at the inpatient pharmacy installation of Karanganyar Regency Hospital is *a waste defect* and *waiting*. Based on the study's results, the problem's root cause is the *critical defect* in prescribing drugs by doctors outside the formulary and *the waste of critical waiting*. That is, the prescription from the inpatient room came in simultaneously. Proposed improvements by the method *lean hospital* is to monitor and evaluate the implementation of the formulary on an ongoing basis, implement electronic prescribing, and provide *software* specifically for data entry.

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