

# Lean Hospital Approach To Identify Critical Waste In Outpatient Pharmacy Installation Of PKU Muhammadiyah Gamping Hospital

Baiq Sandi Kartika Sari, Tri Ani Marwati, Muhammad Syamsu Hidayat

**Abstract:** Lean hospital is a business that is carried out in a sustainable manner by the hospital with the aim of eliminating waste and increasing the value of service products for customers. This study aims to determine the critical waste that occurs in the outpatient pharmacy service at PKU Muhammadiyah Gamping Hospital and its root causes. This type of research is a type of qualitative research with a case study approach. The research subjects were all outpatient faramsi officers at the PKU Muhammadiyah Gamping Hospital. Data collection techniques used questionnaires and in-depth interviews. The analysis technique uses Borda analysis. The results of the analysis show that the critical waste or waste that has the highest ranking is waste waiting with a percentage value of 19%, then the lowest waste is waste human potential of 8%. The root cause of critical waste (waste waiting) is the accumulation of patient prescriptions at certain times due to uneven doctor practice hours. The proposed improvement which aims to minimize waste in the Outpatient Pharmacy Installation is by leveling or called leveling (heijunka) the doctor's practice schedule, which starts at 07.00 on time and the hospital recruits permanent doctors, making it easier to arrange doctor's schedule. In addition, the proposed improvement to overcome other wastes is by applying the 5S method which is believed to be very superior in the lean concept.

**Keywords:** lean hospital, critical waste, pharmaceutical installation

## 1. INTRODUCTION

In this era of globalization which is marked by increasingly sophisticated technological developments, the competition between hospitals is getting higher and hospital hospitals are experiencing increasingly fierce competition because the number of houses is increasing today, both private and government hospitals. Therefore, hospital institutions must continuously improve the quality and quality of patient care systems. Based on the Law of the Republic of Indonesia Number 44 of 2009, a hospital is a facility that provides complete health services for both the public and health service providers for individuals, so that the hospital has a very important role in realizing the highest degree of health. [1] Therefore, quality service in accordance with established standards and quality service is a must and absolutely must be fulfilled by a hospital in providing services to all levels of society. One of the health service units located in a hospital that has a very important role in it is a pharmaceutical installation. Medical installation is an important part of the hospital sector. The hospital will find it difficult to carry out activities if there is no medicine available at the hospital. The pharmaceutical installation has great influence on hospitals and various health care organizations. [2] The hospital pharmacy installation is a unit that organizes all pharmacy service activities in a private and government hospital. The importance of the role of pharmaceutical installations in health services and pharmacy installations is the largest source of income for a hospital, therefore the strategy for developing a pharmacy installation in a hospital needs to be improved quality service. [3]

Pharmacy installations are required to improve the quality of service in a sustainable manner (continuous improvement), because the management of pharmaceutical installations is very significant for the quality and revenue of the hospital. Various problems that often occur during the service process, namely complicated procedures, slow service of pharmacy officers, the information submitted by pharmacy officers is not understood by patients so that it is quite difficult for patients to complete the procedure. This inefficiency in the service process is a problem that must be addressed to improve the quality of pharmaceutical services. There are many problems in this pharmaceutical introduction, so various methodologies have emerged to overcome these problems, one of which is the lean method. Lean aims to minimize or eliminate problems that cause waste and improve service quality in the form of value added products and services during the service process in pharmaceutical installations. [4] Lean is a method that can be used by hospitals in improving the quality of service to patients by minimizing or eliminating errors that will cause waste during the service process. [5] This lean approach can support medical and non-medical personnel in improving the quality of service to patients. [6] Based on the Decree of the Minister of Health of the Republic of Indonesia Republic Number: I29 / Menkes / SK / 11/2008 concerning Minimum Hospital Service Standards, one of the indicators of Minimum Service Standards (SPM) for hospital pharmacy services according to the Ministry of Health, namely: a. Waiting time for non-racik drug services is a maximum of 30 minutes b. The maximum waiting time for concocted drugs is 60 minutes. And what is meant by waiting time for drug services is the time period from the time the patient submits the prescription to receiving the drug, so the minimum standard set by the Ministry of Health is <30 minutes of waiting time for non-concocted drugs and <60 minutes of waiting time for concocted drug services. [7] Lean hospital is a business that is carried out on an ongoing basis by the hospital with the aim of eliminating waste and increasing the value of service products for customers. [8] The lean approach has been widely used by

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hospitals around the world and has yielded many benefits including reducing patient length of stay, increasing efficiency, increasing patient and employee satisfaction, reducing clinical errors, reducing waiting times, improving processes in radiology and drug administration installations, and reduce length of stay and waiting time for patients in the emergency department. [9] PKU Muhammadiyah Gamping Hospital is a development of PKG Muhammadiyah Yogyakarta Unit 1 Hospital, opened on February 15, 2009. In June 2012, it passed accreditation of 5 Service Fields which was confirmed by an accreditation certificate from KARS with Decree No KARS-SERT / 006 / VI / 2012. On 18 November 2013 through the Decree of the Minister of Health No: HK.02.03 / 1 / 1976/20 13 it was designated as Type C Hospital. PK U Muhammadiyah Gamping Hospital has many supporting service facilities, one of which is pharmaceutical installation services. This lean hospital concept is very suitable to be applied in PKU Muhammadiyah Gamping Hospital with Type C Hospital, which is still carrying out the development process in each installation in the hospital, including outpatient pharmacy installations where this installation plays an important role in drug services to patients. as well as in terms of the hospital business itself. Supported by research related to the lean hospital concept that has been carried out in several hospitals, encouraging researchers to conduct research with the application of the lean hospital concept at PKU Muhammadiyah Gamping Hospital. Berdasarkan hasil wawancara dengan Supervisor Pharmacy Services at the PKU Muhammadiyah Gamping Clinic, that the number of normal patient visits every day is less than 400 patients, with 9 pharmacists divided into 3 shifts, namely morning, afternoon and night shifts. And based on the informant's explanation that the morning shift often experiences congestion of patients or blockage of patients, so that the waiting time for patients to get medicine is quite long because the queue is very long. One of the causes of waste based on the results of the interview is the frequent occurrence of a hospital SIM, clashing doctors' shifts, resulting in accumulation of prescriptions and other obstacles that are written by doctors that sometimes cannot be read by pharmacy officers. The time needed to get a concocted drug and for non-concocted drugs is more than the standard that has been set, which is sometimes more than 60 minutes for concocted drugs and more than 30 minutes for non-concocted drugs. Based on the results of the study, in the outpatient pharmacy installation at PKU Muhammadiyah Bantul, it was found that there was waste waiting and overprocessing. In this study, it is explained that the cause of waste waiting is hospital SIM which often experiences errors due to the accumulation of patients and the presence of officers who experience double jobs, then the root cause of waste over processing is because of the large number of activities that are carried out repeatedly, causing waste, this repetitive activity. such as review of recipes and etiquette writing which is done twice or more. [4] While the research, the discovery of waste waiting caused by the length of time using the SIM RS server, layout and service process flow is not good and the waste that occurs is also influenced by the limited number of human resources. [10] With the problems that occur during the service process at the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital, it is evidence

that there is still waste or non-value added activities which will have an impact on patient satisfaction and patient loyalty at the hospital. PKU Muhammadiyah Gamping Hospital has also set SOPs related to waiting time for drugs in outpatient pharmacy installations, namely the waiting time for non-racic drugs is 30 minutes and for concocted drugs is 60 minutes. Thus, the waiting time for drugs at the outpatient pharmacy installation is not in accordance with the standards set by the hospital or the standards set by the Ministry of Health.

## 2. RESEARCH METHOD

This research uses qualitative research using a case study approach. The subjects of this study were 19 people, namely: 1 Pharmacy Manager (as key informant), 1 Pharmacy Service Supervisor (as key informant), 2 Outpatient coordinators (as key informants), 2 Pharmacists for outpatient pharmacy installations (as key informants), 10 Pharmaceutical Engineering Personnel. The object of this research is in the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital. The type of information or data used in this study is obtained from primary data and secondary data. In this study, researchers collected primary data or information by distributing questionnaires directly to informants and conducting in-depth interviews with informants, then data sources would provide adequate data and in accordance with the needs of the researcher. In this study, secondary data can be obtained in the form of the organizational structure of outpatient pharmacy installations at PKU Muhammadiyah Gamping Hospital. The data analysis stage used the Borda method, which is a group decision-making method in determining single and multi-winner winners using voting techniques. After the researcher determines the type of critical waste that is in the service process at the outpatient pharmacy installation, then the researcher identifies the root cause of waste through in-depth interviews with selected informants using the 5 why method. The 5 why method is a method used to find the main root causes of problems in the pharmaceutical installation. In this study, interviews were conducted at the time before the pharmacy service started and during the hours that did not interfere with the service process at the PKU Muhammadiyah Gamping Outpatient Pharmacy Installation. The number of subjects or informants in this study was determined by the consideration of obtaining information. The triangulation used in this study was source triangulation and technical triangulation.

## 3. RESULT AND DISCUSSION

Lean hospital is an approach or method that is used continuously for a management system and a philosophy that can be used in changing the perspective of a hospital so that it is more orderly and organized by improving the quality of service to patients, by eliminating errors at each stage of the service process and minimize waiting time. [11] The aim of this lean hospital method is to improve the quality of service to patients by reducing the two main problems that often occur, namely minimizing or eliminating errors (reducing errors) and waiting time. Lean Hospital is needed so that the hospital can meet the needs of patients optimally, especially in outpatient pharmacy installations, and can also provide maximum health services to patients by reducing or eliminating waste which in turn will provide

added value to the hospital. One of the lean method tools most often used in health organizations is value stream mapping, this VSM is used to analyze current conditions or can also identify problem areas and can create design solutions / improvement ideas for these problems. Based on the results of the value stream mapping at the Outpatient Pharmacy Installation of the PKU Muhammadiyah Gamping Hospital, the results of the value stream mapping for the patient service process with non-concocted drug prescriptions were 13.65%. A company is considered lean if the ratio of waste to minimum total activity reaches 30%, and if it has not reached 30% then the company is a un-lean enterprise. [12] So it can be concluded that the service process at the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital cannot be said to be lean. This shows that there are still some activities that are waste which must be identified and eliminated to increase the efficiency of the service process and increase patient satisfaction. After the VAR value is known, the tact time value will then be calculated in order to find out how long it is ideally for a patient to be served. The benefit of the calculation of the Takt time is that it is used to plan the provision of services or products continuously, smoothly, without obstacles and can prevent us from the problem of waste due to excessive production so that the tact time can improve quality and efficiency. The calculation of the Takt time is obtained by comparing the number of working hours of outpatient pharmacy installation staff at PKU Gamping Hospital in one day with the number of patients served in a day. The outpatient pharmacy installation of PKU Muhammadiyah Gamping Hospital in a day can serve approximately 375 patients on average, while the working hours of outpatient pharmacy officers are 24 hours a day or 1440 minutes, so that the result of the tact time is 3.84 minutes. Based on the calculation of the tactic above, it can be concluded that the ideal speed of service required by one patient at the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital is 3.84 minutes. Based on the Decree of the Minister of Health of the Republic of Indonesia Number: 129 / Menkes / SK / II / 2008 that the Minimum Service Standard (SPM) for hospital pharmacy services is a maximum of 30 minutes of waiting time for non-concocted drug services and a maximum of 60 minutes of waiting time for concocted drugs. This, when related to the value of the tact time with the minimum hospital standards for pharmacy services, shows that the tact time is faster than the SPM. In order to avoid excessive accumulation of patients or too long waiting times, during the 3.84 minutes period, there should be no steps or processes that could hinder patient care. If the Takt time is not fulfilled, various problems will occur which will cause waste such as queuing problems, delays, congestion or worse, not all customers will be served. The next stage in this research is to identify critical waste in the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital by distributing questionnaires and then processing it using the BORDA method. Based on the results of distributing questionnaires and analysis using the Borda method, the critical waste (highest waste) that occurs in outpatient pharmacy is 19% waiting waste, while the lowest waste is human potential waste by 8%. And other percentages of waste are 16% defect waste, 14% waste transportatin, 13% waste motion,

11% waste inventory, 10% waste over processing, then 9% waste overproduction percentage. It is known that waiting is a type of critical waste or a type of waste that most often occurs in services at the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital because waiting waste is in the first level among other wastes with a percentage of 19%. Waste waiting is the absence of ongoing activity so that waste will occur which will result in a waiting process, for example, such as waiting time for people, machine waiting time, or waiting time for materials to be processed. [13] Based on the results of the study, that the occurrence of waste waiting is caused by various factors, including officers who often come late, the existence of bottlenecks in a process so that patients have to wait and besides that the cause of waste waiting is that officers share an equipment or machine which will cause delays in the service process. [14] In analyzing the factors that cause critical waste that occurs in the service process at the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital, it is carried out by in-depth interviews with selected informants using the 5 why method. The 5 why method is an approach or method used to understand the causes of the problem, where asking why questions repeatedly (Kuswardana et al., 2017). [15] The 5 whys analysis method is intended to obtain information about the causes of critical waste (waste) in the service process at the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital. Based on the results of interviews conducted by researchers to informants using the 5 whys method in this study, it can be concluded that the factor that causes critical waste is because the doctor's schedule has not been adjusted optimally or evenly by the management (medical committee), causing the accumulation of prescriptions. medicine at a certain time. The uneven doctor's practice schedule causes the accumulation of patient prescriptions at certain hours so that it has an adverse impact on outpatient pharmacy, because in the lean concept, doctor's practice hours act as locomotive [14] And based on observations made by researchers that the accumulation of patient queues at certain hours resulted in other waste waiting, such as hospital SIMRS often loading times or errors / trouble, this happened around 11.00 WIB to 15.00, that at these times there were many patients. who came simultaneously from the polyclinic to collect prescriptions at the pharmacy socket, but because the SIMRS capacity / speed decreased, it caused pharmacy officers to take a long time to enter data. Then this problem will cause the next process to be longer so that it can affect the long waiting time. With the existence of bottlenecks in a service process or system it will cause obstruction of other processes or will affect the flow of the service process so that patients have to wait. [15] The things above are the cause of waste waiting that occurs in the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital, therefore it is necessary to make improvements to minimize or eliminate this waste to improve the quality of service to patients. Efforts in the proposed improvement must reflect the values in the Islamic religion that are derived from the Qur'an, and in improving the waste of this service process in accordance with the word of Allah SWT in QS Al-Isra 'Verse 27, namely: "Surely those who are extravagant are Satan's brothers, and Satan is very much rejecting his Lord".Based

on the identification of the factors that cause critical waste in the outpatient pharmacy installation, the type of improvement that researchers can propose is by leveling (heijunka) the doctor's practice hours, so that doctors start practicing at 07.00 on time, in this way doctor's prescriptions do not accumulate. at certain times. According to Dima (2018), in the lean concept the doctor's practice schedule / hours acts as a locomotive and the outpatient pharmacy installation is the last carriage of a series of trains. So it can be concluded that if the locomotive is obstructed, it will greatly affect the entire train series. And it will have an unfavorable impact for outpatient installations, which are the determinants of a hospital's services. Heijunka is one of the methods used to ensure that all work processes or services at the PKU Gamping outpatient pharmacy installation take place at a certain level equally. The concept definition of Toyota is an smoothing of the work schedule, namely by taking actual demand, determining the volume pattern and product mix, and making an even schedule every day. Attaining heijunka is fundamental in eliminating Mura (imbalance), is fundamental in eliminating Muri (overload) and Muda's wasted work. [16] The application of the Heijunka method is very important in an effort to create a lean manufacturing system. The following is a quote according to Taiichi Onho (1988), who succeeded in applying the Just in Time concept, the sentence pronounced is: "The slower but consistent tortoise causes less waste and is much more desirable than the speedy hare that races ahead and then stops occasionally to doze. The Toyota Production System can be realized only when all the workers become tortoises. That according to Onho, a slow but consistent tortoise is better than a rabbit that runs fast but stops occasionally to rest. In fact, he said the Toyota Production System could only be implemented if all workers became tortoises. In addition to the proposed improvement using the heijunka / leveling method (leveling) the doctor's practice hours, the researcher also proposes a short-term improvement idea to overcome other waste, namely by implementing the 5S method in the outpatient pharmacy installation of the PKU Muhammadiyah Gamping hospital. Short-term repairs are repairs that do not require a long time, which do not require large costs and can also be implemented in a period of 3-6 months. [17] The 5S method is a basic concept that was first developed by a manufacturer in Japan, namely the Toyota company, and the company has succeeded in making the system lean. The 5S method is believed to be very superior in lean concepts and this method focuses as a problem solving in overcoming workplace organizational problems. Although this method was originally developed by a manufacturing company, there have been many previous studies that can implement the 5S method in the healthcare industry. This statement is supported by research conducted by Fanny Y.F.Young in 2014 in Hong Kong with the title "The Use of 5S in Healthcare Services", this research has succeeded in proving that the 5S method can be implemented in health services. The 5S method aims to create a neat, clean and safe work environment. That way, the 5S method can reduce the problem of waste in the workplace such as the waste that occurs during the service process at the Outpatient Pharmacy Installation of the PKU Muhammadiyah Gamping Hospital, which can hinder the efficiency and productivity of workers in carrying

out their activities, and can also reduce dirty manufactured goods. This can lead to high production costs, which should not be for hospitals or companies to pass on these costs. [18] The 5S methodology comes from Japanese, namely Seiri (brief), Seiton (neat), Seiso (clean), Seiketsu (care) and Shitsuke (diligent). Meanwhile, 5S in English are Short, Store, Shine, Standardize and Sustain. The purpose of implementing the 5S method is to achieve effectiveness and efficiency in carrying out a job, especially activities related to storage of goods. [19] The explanation of 5S is presented as follows:

#### **Seiri (Sort / Summarize / Sort)**

At this stage it refers to the selection or grouping of elements in the workplace, which will be divided into 2 main categories, namely the important (required) and unimportant or unnecessary categories. Seiri is an activity that aims to separate materials / goods or equipment that are not needed in the workplace. So that it will provide more space for storing equipment or other materials. The first step at this stage is to separate the material that is needed and which is not needed to be discarded or removed. Based on the observations of researchers, there are still many items that are no longer needed or not needed during the service process that are still stored in the Outpatient Pharmacy Installation room of PKU Muhammadiyah Gamping Hospital. Based on the concept of seiri this is not appropriate because goods that are not used or that do not support the service process, especially those that are no longer functioning must be immediately eliminated because these problems will affect the work efficiency of employees, work productivity, work quality and work safety.

#### **Seiton (Store / Neat)**

After the seiri stage is carried out, the next stage will be carried out, which is known as the seiton stage. Seiton is an activity that aims to make material or other equipment neatly arranged so that it is easy to find when using the item. With this, it will minimize the time needed to find the items needed. [18] There are 5S guidelines for storing goods, can be seen in the table below: [11]

**Table 1.** 5S Guidelines for Storage of Goods Based on Frequency of Use.

Frequency of Use	Storage Guidelines
Hourly	Affordable Hands
Every shift	Just walk a little
Daily	Walk some distance
Monthly	Department store room
Annually	Hospital storage room

Based on the results of observations by researchers at the Outpatient Faransi Installation at the PKU Muhammadiyah Gamping Hospital, it has not been implemented properly in accordance with the seiton concept. This can be seen from the fact that there is still placement of drugs that cannot be reached by hand, so that pharmacy officers need aids when taking the drugs. The most important principle is that in the second stage (seiton), namely placing items that are easily accessible to pharmacy officers, which are located at a height between the shoulders and waist of the average employee so that employees find it easier to retrieve these items, especially when these items are categories of goods

that are often used. After placing the goods or equipment in an appropriate place or in a strategic place, the Seiton principle also requires that the goods be easily recognized by anyone who needs them, therefore instructions are needed to help identify where the goods are, then what types of goods are and in what quantity. stock available. This is called "Seiton Visual". Instructions plates can be made through several stages, for example, item code plates, shelf plates and so on to suit your needs. The use of this plate can also be used to mark files or other items in the pharmaceutical installation area. Then this method will reduce the energy time of the Persian officers or other employees in finding the items needed. According to Shaikh et al. (2015), there are several advantages in implementing the Seiton concept, namely:

- a. Increase production efficiency
- b. Increase effectiveness
- c. Can minimize the time needed when looking for items
- d. Increase work security / safety.

### **Seiso (Shine / Clean / Clean)**

The next step is to maintain cleanliness and tidiness in the workplace, or in the 5S method it is called Seiso. Seiso is an activity that aims to maintain the cleanliness of the work environment, both the workplace and the items or materials contained in the area. An example of the Seiso stages in the manufacture industry is when an officer / employee complains about a machine while working, then this incident should not immediately be concluded that the machine is really damaged, because there could be a need for cleaning in the workplace. Based on the observations of researchers at this stage at the Outpatient Pharmacy Installation of the PKU Muhammadiyah Gamping Hospital, the cleanliness in the place has been carried out quite well, because every morning it is cleaned by cleaning service. In this case, it is better if employees or pharmacy officers take part in maintaining cleanliness so that the room becomes even more comfortable. A clean environment is the responsibility of all employees at the place. [18] The thing that must be considered at this seiso stage is the need to make a cleaning schedule that is agreed upon by all officers or employees at the place. The agreed schedule must explain what will be cleaned, what methods will be used and then who will be responsible for each of these sections. [20]

### **Seiketsu (Standardize / Treat / Consolidate)**

Seiketsu is an activity that aims at sorting (seiri), structuring (seiton) and cleaning (seiso) activities that have been carried out in order to continue to be carried out continuously, so one of the steps taken at this stage is to make standardization. So in this study the work standards set at the pharmacy installation would be better if it could be stated in the form of SOPs that were legalized and legalized by the hospital leadership so that the staff would increase in carrying out their work. The principle at the seiketsu stage is striving for a well-cared for work place that is always maintained, therefore the concept of seiketsu or standardize is necessary. The workplace is well maintained and with established standards, so things that deviate or do not comply with standards are usually easily recognized so that problems can be prevented as early as possible. [15]

Sh itsuke (Sustain / Diligent / Habit) Shitsuke is a stage to motivate workers to continuously implement or accustom the 5S culture as an effort to create a better work environment. In order for the implementation of 5S culture to be carried out continuously, it is necessary to familiarize oneself and need discipline in doing work in accordance with predetermined standards and future plans are built so that the work system can continue to be developed, then always evaluated with regular group discussions. There are several important aspects that can be applied to the shitsuke concept, namely imposing sanctions on all officers or employees who violate the rules contained in 5S and giving awards to employees who are most disciplined in implementing 5S in their daily activities. So in this study the method of giving sanctions and rewards is considered in implementing 5S culture in the Outpatient Pharmacy Installation of PKU Muhammadiyah Gamping Hospital, [21] This is an initial effort to motivate workers to be more disciplined in implementing 5S in their daily work, with the hope that Over time, individual habituation is formed to make 5S a culture in the workplace. The advantages of applying the Shitsuke concept are as follows:

- a. Increase awareness among employees
- b. Reducing errors caused by employees
- c. Improve relations between employees.

## **4. CONCLUSION**

The results of the analysis show that the critical waste or waste that has the highest ranking is waste waiting with a percentage value of 19%, then the lowest waste is waste human potential of 8%. The root cause of critical waste (waste waiting) is the accumulation of patient prescriptions at certain times due to uneven doctor practice hours. The proposed improvement which aims to minimize waste in the Outpatient Pharmacy Installation is by leveling or called leveling (heijunka) the doctor's practice schedule, which starts at 07.00 on time and the hospital recruits permanent doctors, making it easier to arrange doctor's schedule. In addition, the proposed improvement to overcome other wastes is by applying the 5S method which is believed to be very superior in the lean concept.

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