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IDENTIFYING POTENTIAL IMPROVEMENTS IN DRUG SERVICE PROCESSES AT RS X SEMARANG PHARMACY INSTALLATION: LEAN MANAGEMENT APPROACH

Emy Novita Sari[1]*, Septo Pawelas Arso[2], Sutopo Patria Jati[3]

[1*, 2,3] *Master Program in Public Health, Universitas Diponegoro, Indonesia*
e-mail: emynovitasari@gmail.com

*Corresponding Author

Abstract: *Pharmacy installations are an integral part of the health service system in hospitals, which is oriented towards patient care. One indicator of the quality of pharmaceutical services is the waiting time for drug services, where the waiting time for drug services is very determining. This study aims to analyze the waiting time for drug services using the Lean concept in the Outpatient Pharmacy Installation X Hospital Semarang. This research is descriptive analytical research conducted at the Pharmacy Installation X Hospital Semarang. The research was conducted from July to September 2023. Researchers calculated the waiting time for drug services for 100 prescriptions consisting of 50 compounded prescriptions (25 UHC prescriptions and 25 non-UHC prescriptions) and 50 ready-made or non-mixed drug prescriptions (25 UHC prescriptions and 25 non-UHC prescriptions). The data analysis technique was carried out in a qualitative descriptive manner by analyzing the results of observations. Then root cause analysis was carried out by in-depth interviews with the Head of Pharmacy and source triangulation with the Medical Support Manager of Hospital X Semarang. The minimum time required to process non-concocted drug prescriptions for UHC patients is 23 minutes, while the maximum time required is 171 minutes (average 81.84 minutes). Prescribing non-concocted medicines for non-UHC patients takes a minimum of 21 minutes and a maximum of 108 minutes (average 44.60 minutes). Prescribing concocted medicines for UHC patients takes a minimum of 53 minutes and a maximum of 180 minutes (average 99.80 minutes). Prescribing concocted medicines for non-UHC patients takes a minimum of 48 minutes and a maximum of 128 minutes (average 73.56 minutes). The total meantime for non-concocted medication was 66.90 minutes, which was divided into a mean VA of 33.72 minutes with a percentage to CT of 51.89% and NVA of 32.18 minutes with a percentage to CT of 48.11%. The total meantime for concocted medication was 86.06 minutes, which was divided into a mean VA of 43.08 minutes with a percentage of CT of 50.05% and Non-VA of 42.98 minutes with a percentage of CT of 49.95%. Based on determining problem priorities according to the table above, the highest score for the problems found was matherial. Concocted medicines have a longer waiting time compared to non-conocted medicines, especially for UHC patients. The value stream mapping assessment of non-concocted medicines resulted in an average non-value added of >30%, which means there is high waste, which affects the waiting time for medicines. The average overtime for non-concocted medicine services is more than 30 minutes, as well as more than 60 minutes for compounded medicines. The matherials aspect is what must be addressed first.*

Keywords: *Pharmacy, Lean management, Waste, Waiting time*

INTRODUCTION

Pharmaceutical installations are an integral part of the patient-care-oriented healthcare system in hospitals. Pharmaceutical services are closely related to the identification, prevention, and troubleshooting of drug-related problems (Rikomah, 2017). This implies that the efficiency of the Pharmaceutical Installation greatly affects the level of patient satisfaction and the reputation of the hospital as a whole and is related to the quality of service. In this context, Pharmaceutical Installations must continue to make continuous improvements and consider a paradigm shift to become one of the sources of income for hospitals (Musdar et al., 2023). One indicator of the quality of pharmaceutical services is the waiting time in drug service, where the waiting time for non-concocted drugs should not exceed 30 minutes and for concocted drugs should not exceed 60 minutes (Masuari, 2021)."

Previous research at the MCEB pharmacy building of Sultan Agung Islamic Hospital Semarang showed that the average waiting time for non-concocted prescription services was 48.9 minutes and concocted prescriptions were 46.54 minutes. Some prescriptions that do not meet the waiting time

standards are non-concocted, especially from JKN patients by 85.7% (Purwandari et al., 2017). Another study at the outpatient pharmacy facility of Atma Jaya Hospital showed that the total waiting time for non-concocted prescriptions was 88 minutes, activities that added value 13 minutes (14.7%), and activities that did not add value as much as 75 minutes (85.3%) (Suryana, 2018). This waiting time problem indicates a number of wastes in the Hospital Pharmacy Installation, which can have an impact on patient satisfaction (Faramita & Wiyanto, 2016).

Waste is a condition that does not have a good impact on healing patients, so it must be eliminated or minimized (Faramita & Wiyanto, 2016). Value-added (VA) and non-value-added (NVA) assessments distinguish activities that provide added value for customers and those that do not. One way to eliminate NVAs is to implement Lean Management (Seto et al., 2015). This effort is carried out to eliminate waste and increase the added value of products, both goods and services, in order to provide value to customers, society, and the economy with the aim of reducing costs, accelerating service time, and improving quality (Restudana & Darma, 2022; Siregar, 2018). Lean management has been widely accepted and implemented as a set of tools, methods, and techniques in various companies around the world (Mousavi Isfahani et al., 2019). The implementation of Lean management is reportedly impacting changes in healthcare with dramatic achievements in terms of quality, safety, and efficiency. Some countries, such as the United States, the United Kingdom, and Australia, have successfully adopted this method. A study at the pharmacy facility of Queen Elizabeth Hospital, Kinabalu, Malaysia, showed that Lean Management successfully reduced the waiting time for prescription services (Dima, 2018; Restudana & Darma, 2022; Yani et al., 2022).

"The Pharmacy Installation at RS "X" Semarang has various indicators of pharmaceutical service quality, including drug conformity with the national formulary, near-miss incidents of drug administration, proper storage of human rights and LASA drugs, timeliness of antibiotic administration, completeness of filling out surgery patient education sheets at pharmaceutical installations, accuracy of stock-taking reporting, waiting time for concocted drug services, and waiting time for non-concocted drug services. The biggest challenge and those who still need to meet the Minimum Service Standards (SPM) is in the drug service waiting time indicator. RS "X" has set a priority target for achieving waiting times for prescription concoction services by 85% and non-concoction by 90%.

Quality data from Pharmaceutical Installations (2021) shows that only 79.84% of concocted prescriptions are in accordance with SPM, while non-concocted drug prescriptions that meet SPM are only 74.00%. In 2022, the percentage of non-concocted drug prescriptions that comply with SPM increased to 85.84%, but concocted drug prescriptions actually decreased to 71.24%. Although RS "X" Pharmaceutical Installation has routinely evaluated PDSA cycles every three months for the past few years, achievement figures that are still below SPM indicate that significant changes have not been achieved. Therefore, the "X" Hospital Outpatient Pharmacy Installation needs to conduct further evaluation with the aim of improving the waiting time for prescription services with a focus on improving service flow using Lean Management tools, including Value Stream Mapping. This study aims to analyze the waiting time for drug services by applying the Lean concept in the Outpatient Pharmacy Installation of RS "X" Semarang."

MATERIALS AND METHODS

This research is a descriptive-analytical study conducted at the Hospital Pharmaceutical Installation. X Semarang. The study period runs from July to September 2023. In this study, researchers measured the waiting time for drug services for 100 prescriptions, which were divided into two categories, namely 50 concocted prescriptions (25 JKN prescriptions and 25 non-JKN prescriptions) and 50 finished or non-concocted drug prescriptions (25 JKN prescriptions and 25 non-JKN prescriptions). To collect data, researchers used a number of instruments, including interview guides to observe

waiting times in drug service, observation sheets to record observations during the study, stopwatches to measure time, and tools to record all information obtained from interviews with resource persons.

The data analysis process is carried out with a qualitative descriptive approach, which involves analyzing the results of observations. Furthermore, root cause analysis was conducted through an in-depth interview with the Head of Pharmacy, as well as source triangulation with the Medical Support Manager of RS X Semarang. Search results are found in the form of Ishikawa diagrams. The priority of the problem is analyzed by the ultrasound method (Urgency, Seriousness, and Growth), which is a tool to determine the priority order of problem-solving. The data obtained from data collection and processing are then interpreted according to the research objectives, followed by descriptive presentation of the data. This research has passed an ethical review with certificate number 442/EA/KEPK-FKM/2023, issued by the Health Research Ethics Committee of the Faculty of Public Health, Diponegoro University.

RESULTS AND DISCUSSION

Measurement of waiting time for drug service is carried out during service at 09.00-21.00 WIB with a total of 100 prescriptions. Table 1 shows the calculation of waiting time for drug services at the Outpatient Pharmacy Installation of RS "X" Semarang.

Table 1. Calculation of Waiting Time for Drug Services at Outpatient Pharmacy Installation of RS "X" Semarang

Types of drugs	Types of Patients	Processing Time (minutes)		
		Min (minutes)	Max (minutes)	Mean (minutes)
Non Concocted Drugs	JKN	23	171	81,84
	Non-JKN	21	108	44,60
Concoction medicine	JKN	53	180	99,80
	Non-JKN	48	128	73,56

The table above shows that the minimum time needed in prescribing non-concocted drugs for JKN patients is 23 minutes, while the maximum time needed is 171 minutes (average 81.84 minutes). The process of prescribing non-concocted drugs for non-JKN patients takes a minimum of 21 minutes and a maximum of 108 minutes (average 44.60 minutes). The prescription for JKN patients takes a minimum of 53 minutes and a maximum of 180 minutes (average 99.80 minutes). The prescription for non-JKN patients takes a minimum of 48 minutes and a maximum of 128 minutes (average 73.56 minutes).

Table 2. Frequency and Percentage of Punctuality of Drug Service Process Flow Stages at Outpatient Pharmacy Installation of RS "X" Semarang

Patient	On-time		More Time	
	n	%	n	%
Total finished drug	19	38	31	62
Non-JKN	16	64	9	36
JKN	5	20	20	80
Total concocted drugs	3	12	22	88
Non-JKN	7	28	18	72
JKN	9	18	41	82

The table above shows that 62% of prescriptions exceed the waiting time of <30 minutes. Drug services for JKN patients generally exceed waiting times, while for non-JKN patients, it is the opposite. A total of 41 concocted prescriptions exceeded the 60-minute waiting time, with more patients with JKN on time than the non-JKN group. The results of this study have similarities with previous studies, which stated that several factors affect prescription service time, namely, *delay* components,

concocted drugs, poor information systems, availability of less and inexperienced labor, high workload, availability of facilities and infrastructure, drug prescribing that adjusts the national formulary (Dima, 2018; Purwandari et al., 2017).

Other studies have also identified several other contributing factors, namely insufficient service counters, inadequate computers and slow software, drug availability that is not smooth, administration that not all officers understand, and a complicated BPJS management system (Faramita & Wiyanto, 2016; Karuniawati et al., 2016). Other studies also said that the factors that cause long waiting times can be grouped into five *humans*, namely human resources, competence, type of patient, doctor's commitment, and patient discipline (Faramita & Wiyanto, 2016; Karuniawati et al., 2016). Drug service and drug delivery process flow method (Arini & Suwastini, 2020).

Lack of infrastructure materials and machines*, lack of* reception counters, non-current availability of drugs, types of prescriptions, standard operating procedures (SOPs), drug formularies, SIMRS systems, prescriptions coming together, prescriptions that do not match SOPs, and narrow environmental factors, and BPJS patients and the public. This waiting time problem indicates a number of wastes in the Hospital Outpatient Pharmacy Installation, which can have an impact on patient satisfaction (Arini & Suwastini, 2020).

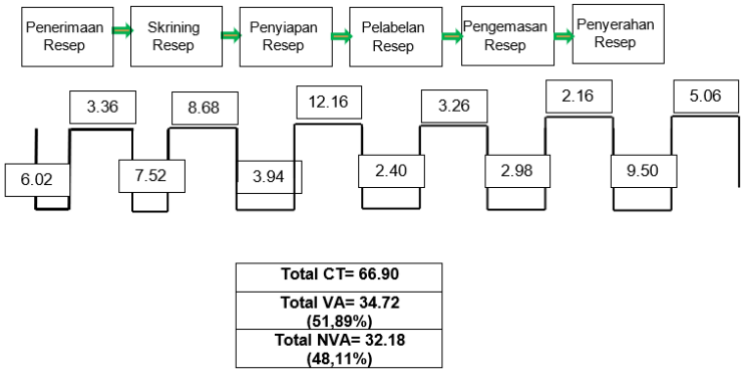

Figure 1. Value Stream Mapping (VSM) Prescription of Finished Drugs (Non-Concoction) RS "X" Semarang

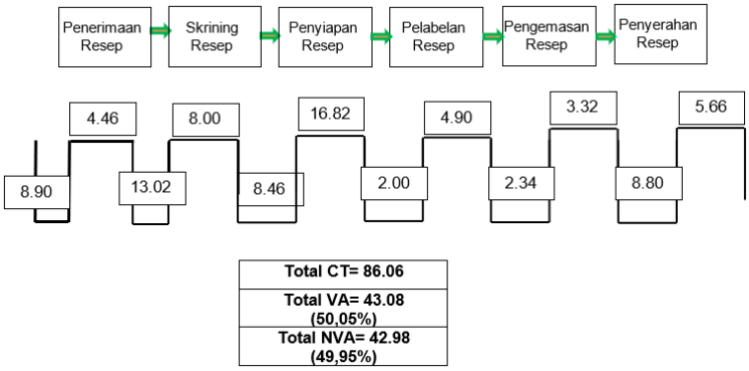

Figure 2. Value Stream Mapping (VSM) Prescription Medicine Formulated by RS "X" Semarang

Figure 1 shows that the average total time of non-concocted drugs is 66.90 minutes, which is divided into an average of VA 33.72 minutes with a percentage of CT 51.89% and NVA of 32.18 minutes with a percentage of CT 48.11%. The total average time of the concocted drug was 86.06 minutes, which was divided into an average VA of 43.08 minutes with a percentage of CT of 50.05% and Non-VA of 42.98 minutes with a percentage of CT of 49.95% **(Figure 2).** The results of observations by applying Lean Management show some significant findings.

There are two stages that most affect patient waiting time, namely, time in compounding and confirmation of prescriptions at the time of screening. The process of compounding concocted recipes,

especially for pediatric patients, has proven to take a long time. This may be due to the high level of caution that must be exercised in preparing the dosage. Confirmation of prescriptions at the sjrining stage also requires extra time because accuracy is needed in ensuring the prescription is in accordance with applicable medical standards.

The waiting time was also affected by the quality of work of the Pharmaceutical Therapy Team (TTK) on duty at that time. The observations showed that TTKs were more efficient in carrying out their duties than others, resulting in differences in waiting times for patients. The role of interns also affects the time medication servicers may work slower than experienced staff. The implementation of Lean Management at RS X Semarang needs to be emphasized to increase efficiency in the process of compounding concoction recipes and confirming recipes.

The hospital service process uses VA and NVA assessments to distinguish activities that provide added value to customers and those that do not. *Value-added* is an activity that directly helps create a product or service desired by customers. At the same time, NVA is an activity that does not provide added value or may hinder the production process or service (Faramita & Wiyanto, 2016). One way to eliminate non-value added or waste in pharmaceutical installations is to apply the concepts and principles of sustainable Lean Management (Dima, 2018). In pharmacy services at Hospital "X," the actual value added of patients from the initial service to each stage is actually not long, but the delay or non-value added is long.

The second problem found is that some patients are 80% JKN participants, so prescribing must also be adjusted to the national formulary, and cannot be given outside prescriptions. So that the scope of drug use becomes narrower, and if there is an empty drug must be reconfirmed to change the drug or wait for the drug to exist, then re-edit on the computer regarding the prescription given. The third problem is that some diseases such as DM, dyslipidemia, and other chronic diseases that can be given if there are recent test results can also cause an increase in waiting time.

Table 3. Prioritization of Problems with Waiting Time for Pharmaceutical Services using the ultrasound method (Urgency, Seriousness, and Growth)

No	*Problem*	*U*	*S*	*G*	*Total*
1	*Man*	*3*	*4*	*3*	*10*
2	*Methode*	*4*	*4*	*4*	*12*
3	*Materials*	*5*	*5*	*5*	*15*
4	*Environment*	*2*	*2*	*2*	*6*

One method that can be used to determine the priority of problems is the ultrasound method (*Urgency, Seriousness,* and *Growth*). This method is one of the tools for drawing up a priority order of problems to be solved (Bertagnolli, 2018). You do this by determining the level of urgency, seriousness, and development of the problem by determining the Likert scale with values 1-5. The higher the number, the greater the value. The issue that has the highest total score is a priority issue (Setyawan & Supriyanto, 2020).

Based on the prioritization of problems according to the table above, the highest score of the problems found was a mean total score of 15, with an *urgency score (U) of 5,* Seriousness *(S) of 5, and a Growth* score (G) *of 5*. The management of Hospital "X" believes that once material issues are resolved, problems related to management and methods will be more easily addressed. Additionally, they consider material problems to be issues that are likely to be handled in the near future, given that Hospital "X" is currently preparing a Hospital Information System (HIS) in collaboration with an information technology vendor. Therefore, material concerns are considered a top priority among the main issues that need to be resolved.

Lean is an ongoing effort to eliminate waste and increase the added value of products in the form of goods and services in an effort to provide value to customers, society, and the economy with the aim of reducing costs, accelerating service time, and improving quality through the elimination of total waste (Bertagnolli, 2018). The adoption of Lean is reportedly impacting healthcare with dramatic gains in quality, safety, and efficiency (Sinha & Matharu, 2019). A study at the pharmacy facility of Queen Elizabeth Hospital, Kinabalu, Malaysia, showed that Lean Management successfully reduced the waiting time for prescription services (Dima, 2018; Restudana & Darma, 2022; Yani et al., 2022).

The assessment *of the value stream mapping* of non-concocted drugs obtained an average result *of non-value added* >30%, which means that there is *high waste* that affects drug waiting times. The most significant wastes identified in this study include waiting, non-utilized people, defects, and inventory. This study has some things that could be improved. First, we do not differentiate prescriptions based on a patient's diagnosis or case. Second, the results of the research and strategy design provided can only be in the form of suggestions, not direct application, because researchers are parties outside the hospital.

CONCLUSION

Concocted drugs have a longer waiting time compared to non-conocted drugs, especially for JKN patients. Value stream mapping assessment of non-concocted drugs obtained an average result of non-value added >30%, which means that there is high waste that affects drug waiting times. The average non-concocted drug service is more than 30 minutes, as well as concocted drugs more than 60 minutes. Matherials aspect is what must be addressed first.

REFERENCES

Arini, H. D., & Suwastini, A. (2020). Waktu Tunggu Pelayanan Resep di Depo Farmasi RS X. *Lombok Journal of Science*, *2*(2), 40–46.

Bertagnolli, F. (2018). *Lean management*. Springer.

Dima, Z. L. (2018). Penggunaan Konsep Lean untuk Meningkatkan Efisiensi Pelayanan Instalasi Farmasi Rawat Jalan di Rumah Sakit Anna Medika Bekasi. *Jurnal Administrasi Rumah Sakit Indonesia*, *2*(1).

Faramita, N. I., & Wiyanto, S. (2016). Penyebab dan Solusi Lama Waktu Tunggu Pelayanan Obat di Instalasi Farmasi Rawat Jalan Rumah Sakit. *Jurnal Kedokteran Brawijaya*, *29*(3), 245–251.

Karuniawati, H., Hapsari, I. G., Arum, M., Aurora, A. T., & Wahyono, N. A. (2016). Evaluasi pelaksanan standar pelayanan minimal (SPM) farmasi kategori lama waktu tunggu pelayanan resep pasien rawat jalan di RSUD Kota Salatiga. *Kartika: Jurnal Ilmiah Farmasi*, *4*(1), 20–25.

Masuari, W. I. (2021). Kualitas Pelayanan Informasi Obat di Rumah Sakit X Gianyar. *Jurnal Sosial Sains*, *1*(9 SE-Articles), 1.112-1.118. https://doi.org/10.36418/sosains.v1i9.206

Mousavi Isfahani, H., Tourani, S., & Seyedin, H. (2019). Lean management approach in hospitals: a systematic review. *International Journal of Lean Six Sigma*, *10*(1), 161–188.

Musdar, T. A., Kurniawati, J., Mardiati, N., Fitriah, R., Hadi, A. E. K., Sugihantoro, H., Razak, A., Puspasari, H., & Kalsum, U. (2023). *Manajemen Farmasi Rumah Sakit*. Global Eksekutif Teknologi. https://books.google.co.id/books?id=8cS1EAAAQBAJ

Purwandari, N. K., Suryoputro, A., & Arso, S. P. (2017). Analisis waktu tunggu pelayanan resep pasien rawat jalan di Depo Farmasi Gedung MCEB RS Islam Sultan Agung Semarang. *Jurnal Kesehatan Masyarakat (Undip)*, *5*(1), 103–110.

Restudana, K. A., & Darma, G. S. (2022). Upaya Penerapan Metode Lean Thinking Pada Proses Pelayanan Farmasi Rawat Jalan. *Relasi: Jurnal Ekonomi*, *18*(1), 101–131.

Rikomah, S. E. (2017). *Farmasi Rumah Sakit*. Deepublish. https://books.google.co.id/books?id=m8dcDwAAQBAJ

Seto, S., Nita, Y., Triana, L., & Moechtar, J. (2015). *Manajemen Farmasi 2: Edisi 4 : Lingkup apotek, farmasi rumah sakit, industri farmasi, pedagang besar farmasi*. Airlangga University Press. https://books.google.co.id/books?id=fs-EDwAAQBAJ

Setyawan, F. E. B., & Supriyanto, S. (2020). *Manajemen rumah sakit*. Zifatama Jawara.

Sinha, N., & Matharu, M. (2019). A comprehensive insight into Lean management: Literature review and trends. *Journal of Industrial Engineering and Management (JIEM)*, *12*(2), 302–317.

Siregar, S. E. (2018). *Waktu Tunggu Pelayanan Resep Rawat Jalan Di Instalasi Farmasi Rumah Sakit Universitas Sumatera Utara*.

Suryana, D. (2018). Upaya Menurunkan Waktu Tunggu Obat Pasien Rawat Jalan dengan Analisis Lean Hospital di Instalasi Farmasi Rawat Jalan RS Atma Jaya. *Jurnal Administrasi Rumah Sakit Indonesia*, *4*(2).

Yani, F., Maraiyuna, S., & Vonna, A. (2022). Evaluasi Waktu Tunggu Setelah Redesign dan Penerapan Lean Pharmacy Pada Pelayanan Farmasi Rawat Jalan. *Journal of Medical Science*, *3*(1), 19–30.