Identification of Influence Factors on Waiting Time of Prescription Services for Outpatient

Dorra Ribta Alam, Ermi Girsang*, Sri Lestari R. Nasution
Faculty of Medicine,Universitas Prima Indonesia, Indonesia

Keywords: Waiting time, prescription service, hospital pharmacy.

Abstract: Waiting time is one of the minimum standards for pharmaceutical services in a hospital. From many studies, there are still many pharmaceutical services that do not meet the established time standards. The purpose of this study was to identify the factors that influence the waiting time for prescription services in Outpatient Pharmacy. Analytical research uses cross-sectional design. With a sample of 100 prescriptions both finished drugs and concoctions taken by simple random sampling method. Data analysis used univariate analysis, bivariate analysis with Chi-Square Test and multivariate analysis with multiple logistic regression at 95% confidence level (α = 0.05). The involved variableswere Type of Drugs, Number of Drug Items, Work Shift, and Patient Status.It appears that the factors that influence the waiting time for prescription services awere the number of drug items (p = 0.013) and patient status (p = 0.000). The most dominant variable was the patientstatus with Exp (B) / OR about 15,546, which means patients with collateral status have a 15.5 times higher chance of experiencing an extended prescription service compared to patients who pay in cash.

1 INTRODUCTION

Patient waiting times for hospital services are identified by the World Health Organization (WHO) as one of the benchmarks of the health care system.

Patient satisfaction plays a significant role in determining the health outcomes and in the quality of health-care services provided by any health-care organization.It is also directly associated with the patient–provider relationship and with thec ompliance of treatment plans of the patients. Patient satisfaction is measured by using several indicators that include services provided by the health-care professionals, cleanliness, quietness, and wait times. Prolongation of waiting time has long been something that is complained of by the public and seen as one of the things that has the potential to cause dissatisfaction with patients (Alrasheedi, K.F, et al, 2019, Odili *et al*., 2017). A patient's experience of waiting for long periods of time can completely influence his/her perceptions of service quality. A close relationship between patient satisfaction and waiting time has been studied in many studies (Xie *et al*., 2017; Sun, Jing. et all., 2017, Luis Margusino-Framiñán et al.,2017, Sengupta, Mitali, et al., 2019). The 2017 report from the Institute of Medicine's Report on the US "Crossing The Quality Chasm" underlines a framework of 6 principles that must be met in order to remain competitive in the field of health. One of these principles is the ability to provide timely services and reduce delays that can harm patients.

Pharmacy unit provides product services and services in the form of prescription services. Prescription services as the frontline of pharmaceutical services to patients must be managed properly, because the quality of pharmaceutical prescription services is generally associated with speed in providing services.An increasing number of patients visiting outpatient care units will increase increasing challenges for the pharmacy unit to continue to work effectively in providing excellent service to patients (Amerine, et al, 2017). A slow service will cause a long queue, causing an extension of the waiting time for drug services.

Several studies have been carried out where prescription services are still found that are not in accordance with established standards (Himawan, Vanji Budi, et al., 2018). The minimum service standard set by the Kepmenkes is <30 minutes for finished drugs and <60 minutes for compound drugs. From these standards, we will get the level of efficiency, effectiveness and sustainability of Pharmacy services through prescription service

Alam, D., Girsang, E. and R. Nasution, S.
Identification of Influence Factors on Waiting Time of Prescription Services for Outpatient.
DOI: 10.5220/0010286300230029
In *Proceedings of the International Conference on Health Informatics, Medical, Biological Engineering, and Pharmaceutical (HIMBEP 2020)*, pages 23-29
ISBN: 978-989-758-500-5

waiting times, as well as the level of comfort and perception of Pharmacy services through patient satisfaction. The speed of service is target service time can be completed within the time taken determined by the organizer unit service.

Various methods have been carried out to improve pharmaceutical services in terms of reducing waiting times for prescription services (Johann Daniels, *et al*., 2018, Alam *et al*., *2018* , 2015; Loh *et al.*, 2017, Lau*, et al*. 2018). In a study conducted by Nanda*, et al*., 2017, one of the factors that caused the lengthening of prescription service waiting times was due to the long queues and the way that could be done to fix the problems caused by this long queue was to change the structure of the queue model. The way to improve the waiting time is to use a technology-based queuing system and improve the quality and quantity of human resources in the pharmaceutical department (Ulfa et al, 2017; Turnip et al, 2020; Wijaya et al, 2019). Suryana, Danyel, 2018, made improvements by proposing the replacement of a new hospital license and activating the function of the Quality Control Team in the Pharmacy Installation.

Previous studies examined prescription waiting times from the queuing model structure, the quality and quantity of Human Resources in the pharmacy unit . This study was designed to observes the effect of each factor from the pharmacy itself (type of drug, number of drug items, work shifts) and patient status (payment status) on the waiting time for prescription services and to identify the most dominant factor influencing the waiting time for prescription services.

2 METHOD

The study was carried at Pharmacy Unit of the Children's Outpatient Services at the Stella Maris Hospital in Medan in November - December 2019. The population in this study was the number of prescriptions that were received from the pediatric outpatient services. Determination of the population is based on the average number of recipes per month The data obtained by researchers researchers that the number of outpatient prescriptions for children served in the Pharmacy Outpatient Services for Children during January - September 2019 is as follows: In January 2019 : 3951 prescriptions, February 2019 : 3350 prescriptions, March 2019 : 3728 prescriptions, April 2019 : 3743 recipes, May 2019 : 3671 recipes, June 2019 : 3717 recipes, July : recipes, August 2019 : 4809 recipes and in September : 5442 recipes. Thus the average number of prescriptions served in the Outpatient Pharmacy of the Children's Services Unit is 4012 prescriptions. By using the Slovin formula based on the calculated population, the number of samples used in this study is 100 recipes. Samples were taken at random from outpatients. Data is collected by filling out the research sheet that has been provided. The instruments used are digital clock, stationery, calculator and form fields to write data obtained in the research sheet.

Prescription service time will be calculated from the time the recipe is received at the Pharmacy Unit until the drug is received by the patient. Through quasi observing prescriptions received in the Pharmacy Unit for outpatient cases of Child Services in the Children's Services Outpatient Unit, second floor of Stella Maris Hospital. Some factors related to the time of outpatient prescription service are: Types of prescriptions, number of drug items, shift workers and patient status. In this study, the dependent variable (Dependent) is the prescription service time for outpatients in the Pharmacy Installation, while the Independent Variable (Independent) is the type of prescription, the number of drug items, shift workers and patient status.

The data processing is carried out by carrying out various stages, as follows:

1. Coding is to group the samples obtained in accordance with the existing conceptual framework. The sample is coded to facilitate identification and input process to the computer. The author categorizes the data manually based on the group, namely the type of prescription, the number of drug items, staff shifts and the status of the patient into a working paper including equating units of time to minutes
2. Editing is to re-examine the completeness and accuracy of data categorization manually
3. Data Entry is entering data into the computer, in this study using SPSS
4. Cleaning is checking the data that has been re-entered to ensure that the data is free from errors.

Data analysis was carried out univariately to analyze existing variables descriptively by calculating the frequency distribution and the proportions of each dependent and independent variable. Bivariate analysis is continued using Chi-Square to determine the relationship between the dependent variable and independent variables and multivariate analysis using multiple logistic regression tests with a confidence level of 95% (α =

0.05), to find out which variable most significantly influences the waiting time for prescription services. Overall the research is shown in Figure 1.

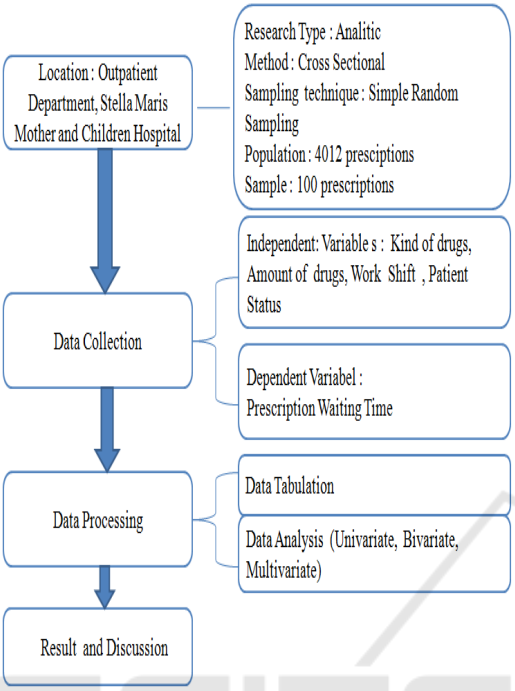

Figure. 1 The Scheme of Research Procedure

3 RESULT AND DISCUSSIONS

From the observations in the field, the flow of the outpatient service process (figure 2) can be explained as follows:

1. Patients registered at the Front Office.
2. Medical staff will conduct an assessment (body weight, body temperature, patient's chief complains, history of allergic)
3. Patient will be served by doctor's on duty.
4. If the patient needs medicine, the doctor will give a prescription
5. Prescription is sent through the hospital system (e-prescription).
6. After prescription are sent to the pharmacy unit, patients will be asked to complete payment at the hospital chasier. Patients can take medicine after completed the payment
7. The pharmacist will open the patient's medical record to see the doctor's prescription and conduct the prescription assesment. Prescription review has to accordance with administrative requirements, pharmaceutical requirements and clinical requirements.
8. Preparation consists of several stages: Compounding, an activity of preparing, weighing, mixing, packaging and giving etiquette to the container. Etiquette. Drug packaging. Submission of drugs. Before the drug is delivered to the patient, a final check must be made of the suitability of the drug with the prescription and drug information.
9. After the medicine is finished prepare, the pharmacy officer will deliver the drug to the patient by showing proof of payment (if the patient pays in cash) or there is confirmation from the guarantor (if the patient is guaranteed).
10. Patients have to be informed about the medicine information that at least includes: how to use the drug, how to store the drug, the duration of treatment, activities and food and drinks that must be avoided during therapy.

From the flow described, Waiting time for prescription services in this research is defined the time needed from the prescription received by the pharmacy unit until the medicine is delivered to the patient / family.

The flow for the prescription waiting time can be seen in figure 2.

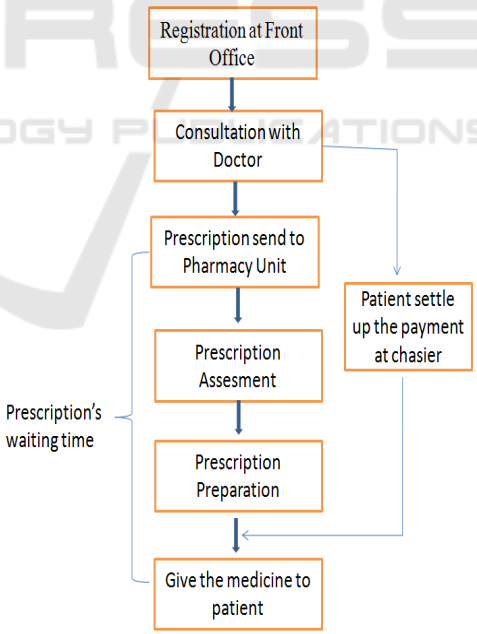

Figure. 2 The Flowchart of Outpatient Department Service

Figure. 3 Pictures of research process

The study was conducted by direct observation in the field of prescriptions that entered the children's outpatient services. Based on data from 100 samples taken, the frequency distribution of each variable is 50% of finished drugs and 50% of concoctions. The number of drug items in the majority is large (55%), minority is small (45%). The majority of work shifts are morning (59%), the afternoon minority (41%) and the majority are cash patients (87%), the minority is guaranteed (13%). Shown Table 1.

Table 1: Frequency Distribution of Each Independent Variable

No	Independen Variables		f	%
1	Type Of Drug	Fixed	50	50
		Concoction	50	50
2	Items	Few	45	45
		Many	55	55
3	Shift	Morning	59	59
		Noon	41	41
4	Patient's status	Cash	87	87
		Guarantee	13	13

Data taken from prescription are independent variables (Table 1) patient status (A), work shift (B), type of drug (C), number of drug items (D) and Dependent variable was waiting time (E). Each variable was given 2 categories: patient cash status with code 1 and guarantee with code 2; morning shift work with code 1 and afternoon with code 2; Type of fixed drug with code 1 and concoction drug with code 2; The number of drug items was few with code 1 and many with code 2; Standard waiting time to code 1 and not standard to code 2. The waiting time periodwas from the time the prescription received at the pharmacy to the medicine being delivered to the patient. The standard time is <30 minutes for finished drugs and <60 minutes for compound drugs. The measured data is given in Table 2.

Table 2: The measured data for each variables of evaluated prescription.

NO	A	B	C	D	E	NO	A	B	C	D	E
1	1	1	1	2	2	51	1	1	2	2	1
2	1	1	1	2	2	52	1	1	2	1	1
3	1	1	1	1	1	53	1	1	2	1	1
4	1	1	2	2	1	54	1	1	1	1	1
5	1	1	2	1	1	55	1	1	1	1	1
6	2	1	2	2	2	56	1	1	2	1	1
7	2	1	2	2	2	57	1	1	2	2	1
8	1	1	1	2	2	58	1	1	2	2	1
9	1	1	1	2	1	59	1	1	1	1	1
10	1	1	1	1	1	60	1	1	1	2	1
11	1	1	2	2	1	61	2	1	1	1	1
12	1	1	2	2	1	62	1	1	1	2	1
13	1	1	2	1	1	63	1	1	2	2	1
14	1	1	1	2	1	64	1	1	1	2	2
15	1	1	2	2	1	65	1	1	1	2	1
16	1	1	1	1	1	66	1	1	1	1	1
17	1	2	2	1	1	67	1	1	2	2	1
18	1	2	1	1	1	68	1	1	1	1	1
19	1	2	1	1	1	69	1	1	2	2	1
20	1	2	2	1	1	70	2	1	2	2	1
21	1	2	1	1	1	71	2	1	1	2	2
22	1	2	1	2	1	72	1	1	1	2	2
23	1	2	2	2	1	73	1	1	1	2	2
24	1	2	2	1	1	74	1	1	1	2	2
25	1	2	1	2	1	75	1	2	1	1	1
26	1	2	2	1	1	76	2	2	2	2	2
27	1	2	2	1	1	77	1	2	1	1	1
28	1	2	2	1	1	78	1	2	1	2	2
29	1	2	1	1	1	79	1	2	2	1	2
30	1	2	1	1	2	80	1	2	2	2	1
31	1	2	2	2	2	81	1	2	1	1	1
32	1	2	2	2	1	82	1	2	1	2	1
33	1	2	1	1	1	83	1	2	1	1	1
34	2	2	1	2	2	84	2	2	1	1	1
35	1	2	1	2	1	85	1	2	2	1	1
36	1	2	1	1	2	86	1	2	2	2	1
37	1	2	1	1	1	87	2	2	1	2	2
38	1	2	1	1	1	88	1	2	2	2	1
39	1	2	2	2	1	89	1	1	2	2	1
40	2	2	1	2	2	90	1	1	2	1	1
41	1	2	2	2	1	91	1	1	2	2	1
42	1	2	2	1	1	92	1	1	1	2	1
43	1	2	1	2	1	93	1	1	2	2	1
44	1	1	2	1	1	94	1	1	1	1	1
45	2	1	1	1	2	95	1	1	2	2	1
46	1	1	1	1	1	96	1	1	1	2	2
47	1	1	2	2	1	97	2	1	2	2	2
48	1	1	2	2	1	98	2	1	2	2	2
49	1	1	2	1	1	99	1	1	1	1	2
50	1	1	2	2	1	100	1	1	2	1	1

Data management was done by testing the characteristics of each variable (Columns A, B, C, D and E), then a bivariate test (Chi-square) was used to determine the effect of the independent variables (Columns A, B, C, D) on the dependent variable (Column E). After finding a variable with a p-value <0.05, it was continued with the Multiple Logistic Regression test to find the most dominant factor influencing the waiting time for prescription service.

From the data that has been processed, it appears that the variable Drug Type (C): from 100 prescription samples, found 68% (34 prescriptions) of finished drugs and 84% (42 prescriptions) of concoction drugs that are in accordance with the standards. Whereas 32% (16 prescriptions) of finished drugs and 16% (8 prescriptions) of concoction drugs did not meet the established time standard. This means that for each drug category> 50% was still in accordance with the expected time standard. It was in line with the chi-square calculation where a p-value of 0.101 was obtained, by mean that there was no effect of the type of drug with prescription service waiting times (Table 3).

The number of drug items (D) prescribed by doctors varies from 1-6 types of drugs. The mean number of drugs prescribed was 2.77. For prescriptions prescribed drugs <2.77 (small category), those that were in accordance with the standard are 88.9% and those that do not meet the standard of 11.1%. For those who are prescribed> 2.77 (many categories), those that comply with the standard are 65.5% and those that do not meet the standard 34.5%. It appears that the more the number of drugs prescribed, the higher the percentage of the number of prescriptions whose waiting time does not meet the established standards. These results were in line with the Chi-Square test between types of drugs to the waiting time for prescription services that get p-value of 0.013, by mean that there was an influence of the number of drug items to the waiting time for prescription services (Table 3).

For the Work Shift variable (B), a total of 59 samples were taken on the work shift morning and 41 samples at the afternoon shift. Of the 59 recipes in the morning shift that were in accordance with the standards as many as 44 recipes (74.6%) and those that did not comply with the standard were 15 recipes (25.4%). For 41 recipes in the afternoon work shift that were in accordance with the standard as many as 32 recipes (78%) and those that were not in accordance with the standard were 9 recipes (22%). Comparison of the percentage obtained in the morning shift and the afternoon shift is almost the same between those in accordance with the standards and those that do not comply with the standards. Statistical test results were in line with using the Chi-Square test obtained p-value of 0.825 meaning that there was no effect of work shifts on prescription service waiting times (Table 3).

Of the 100 samples obtained data for patient status variables, 87 samples are private patients who pay in cash and 13 samples are patients with payments guaranteed by partner companies and insurance. It appears that there were more patients with cash payments than patients with collateral. Of the 87 prescriptions for patients using the cash payment method, 73 prescriptions (83.9%) were in accordance with the standard and those that did not comply with the standard were 14 prescriptions (16.1%). For 13 recipes with a guarantee payment method, 10 recipes (76.9%) were not in accordance with the standard while 3 recipes (23.1%) were in accordance with the standard. These results were in accordance with the results of statistical tests using the Chi-Square test obtained p-value of 0.000 meaning that there was an influence of patient status on the waiting time for prescription services (Table 2).Based on the results of bivariate analysis obtained independent variables significantly related to waiting time for prescription services which the number of drug items (p = 0.013) and patient status (p = 0.000). The complete Chi-Square statistical test results can be seen in Table 3.

Table 3: Effects of Each Dependent and Independent Variables

Variables	Standard		Out of Standard		Qty		*p-value*
	f	%	f	%	F	%	
Type of Drug :							
Fixed	34	68	16	32	50	100	0.101
Concoction	42	84	8	16	50	100	
Items:							
Few	40	88.9	5	11.1	45	100	0.013
Many	36	65.5	19	34.5	55	100	
Shift:							
Morning	44	74.6	15	25.4	59	100	0.825
Afternoon	32	78	9	22	41	100	
Patients Status:							
Cash	73	83.9	14	16.1	87	100	0.000
Guarantee	3	23.1	10	76.9	13	100	

After bivariate testing, it was continued with multivariate testing with multiple logistic regression to obtain the results as listed in Table 3.

Table 4: Significant Multiple Logistic Regression Test Results

Variables	B	Sig	Exp(B)	95% CI for Exp(B)
Type of Drug	1.301	.033	3.672	1.113-12.114
Patient status	2.744	.000	15.546	3.606- 67.030
Constant	-6.509			

The most influential variable in this study is the patient status variable which has an Exp (B) / OR value = 15,546, which means patients with collateral status have a 15.5 times higher chance of experiencing extended prescription service time compared to patients with cash status (without guarantee).

Independent patients (without guarantee) can make payments directly to the cashier. As for patients with guarantees, the hospital billing department must inform the guarantor in advance. The billing process is considered complete when the hospital billing staff has received confirmation from the guarantor about the approval of the guarantee for the services, procedures or drugs given to the patient. Therefore, the difference in prescription service time between independent and guaranteed patients is the time needed to receive confirmation from the guarantor of the cost of patient services. At this time the hospital is doing all the confirmation processes manually. To make improvements, communication should be made with stakeholders so that it can speed up the assessment and clarification process related to the patient's condition. The process that is carried out manually takes longer. With the rapid development of technology, this process should also be done using applications or e-claims, so as to accelerate the process of hospital services, especially in prescription services. Because outpatients cannot receive drugs before the clarification process is completed.

The variable number of drug items that have the value Exp (B) / OR = 3.672 means that patients with many drug items have a 3.6 times higher chance of experiencing an extended prescription service time compared to patients with a small number of drug items.

The average number of prescriptions provided is 2.77, meaning that if the number of drugs prescribed by a doctor is greater than 2.77, it will affect the time required by the pharmaceutical staff to prepare the prescription. The large number of items will affect the addition of time in the numbering phase, the stage of prescription entry, the stage of taking fixed drugs and the stage of making concoction drugs into capsules, packs, and liquids so that it takes a longer time than those with fewer items.

The number of drug items related to the waiting time for prescription services is caused by several things, among others, outpatient pharmaceutical facilities that are too narrow, thus limiting the space for officers. The more the number of drugs prescribed, the more time is needed to input the use of drugs into the system. Therefore, it is need to improve the pharmaceutical facilities in accordance with established standards. Urge doctors through the medical committee to prescribe drugs rationally and reduce polypharmacy.

4 CONCLUSIONS

In this study, the infuence of six-variable on the waiting time for prescription services was identified. Patient status was the most dominant influence on waiting time for prescription service (p-value = 0.000) and Exp (B) / OR = 15,546. Prescription types about 68% of drugs and 84% of concoction drugs are in accordance with the standard service time (p-value = 0.101, no effect on the waiting time for prescription services). The number of drug items was 34.5% prescription with the category of the number of drugs was still not according to the standard (p-value = 0.013, there was an effect of the number of drug items on the waiting time for prescription services with Exp (B) / OR = 3,672). Morning work shift, 74.6% prescription and afternoon shift 78% are in accordance with the standard (p-value = 0.82, there was no affect the waiting time for prescription service).

REFERENCES

Alam, S. Osama , M. Iqbal, Sawar, 2018, Reducing Pharmacy Patient's Waiting Time, *International Journal of Healthcare Quality Assurance*, Vol. 31 No. 7, 834-844.

Alrasheedi, K.F., et al., 2019. The Association Between Wait Times and Patient Satisfaction: Findings From Primary Health Centers in the Kingdom of Saudi Arabia, *Health Services Research and Managerial Epidemiology*, Volume 6: 1-7.

Bhattacharjee, P. and Ray, P. K., 2014. 'Patient flow modelling and performance analysis of healthcare delivery processes in hospitals: A review and reflections', *Computers & Industrial Engineering*, 78, pp. 299–312.

Committee on Quality Healthcare in America and Institute of Medicine, 2017, Crossing the quality chasm a new

health system for the 21st century. Washington DC. National Academy Press.

Davidson, K. W., Shaffer, J., Ye, S., Falzon, L., Emeruwa, I. O., Sundquist., 2017. Interventions to improve hospital patient satisfaction with healthcare providers and systems: A systematic review. *BMJ Quality& Safety*, 26(7), 596–606.

Febrianta , Nanda Surya, Sri Sundari , Dwi Pudjaningsih, 2017, Analisis Waktu Tunggu Pelayanan Farmasi Rawat Jalan Dengan Metode Antrian di RS PKU Muhammadiyah Bantul, *International Journal Of Scientific And Research Publications*, Volume 7, Issue 9

Fitriah,N.,Ika, Nandytia.,Wiyanto, Sastra , 2016. Penyebab dan Solusi Lama Waktu Tunggu Pelayanan Obat di Instalasi Farmasi Rawat Jalan Rumah Sakit. *Jurnal Kedokteran Brawijaya* Vol. 9, Supplemen No. 3, pp 245-251.

George, S., Kamath, R., D'Souza, B. C., & Kamath, S., 2017. Factors influencing patients in hospital selection and satisfaction with inpatient services. *Pakistan Journal of Medical and Health Sciences*, 11(4), 1653–1656.

Himawan, Vanji Budi, et all., 2018. System Effectivity of Pharmacy Services Queue Time in Outpatient Pharmacy Depot RSD Dr. Soebandi Jember. *Health Notions*, 2 (5) : ISSN 2580-4936.

Johann Daniels, et all., 2018. Assesing the impact of a waiting time survey on reducing waiting times in urban primary care clinics in Cape Town, South Africa, *Journal of Public Health in Africa* , 8(639).

Ishijima H, Eliakimu E, Mshana JM. 2016. The "5S" approach to improve a working environment can reduce waiting time: Findings from hospitals in Northern Tanzania. *TQM J*. ;28(4):664-680.

Kalubowila, K. C., Perera, D., Senathilaka, I., Alahapperuma, C., Withana, R. D., & Kapparage, P. D., 2017. Patient satisfaction of services of the outpatient department, Base Hospital, Panadura. *Journal of the College of Community Physicians of Sri Lanka*, 23(2), 63–70.

Kementrian Kesehatan Republik Indonesia, 2008. Keputusan Menteri Kesehatan No. 129/MENKES/SK/II/2008 tentang *Standar Pelayanan Minimal Rumah Sakit*. Jakarta. Kementerian Kesehatan.

Lau, BT, Nurul-Nadiah-Auni AR, Ng SY, Wong SN. 2018. Satisfaction of patients receiving value added-services compared to traditional counter service for prescription refills in Malaysia. *Pharmacy Practice*;16(1):1075.

Luis Margusino-Framiñán et al., 2017. Implementation of Specialized Pharmaceutical Care Hospital Outpatient Clinics in a Hospital Pharmacy Department. *Farmacia Hospitalaria* .Vol. 41 l Nº 6 l 660 – 666.

Odili *et al*., 2017. Patients' Satisfaction with Pharmacy Services in a Secondary Health Care Facility In Benin City, *Nigerian Journal of Pharmaceutical and Applied Science Research*, 6(1):65-72.

Purwandari NK, Suryoputro A, Arso SP., 2017. Analysis of Waiting Time for Outpatient Prescription Service at Pharmacy Depot Islamic Hospital of Sultan Agung Semarang (Analisis Waktu Tunggu Pelayanan Resep Pasien Rawat Jalan Di Depo Farmasi Gedung Mceb RS Islam Sultan Agung Semarang). *Jurnal Kesehatan Masyarakat* (e-Journal); 5(1):103-110.

Ronen, B., Pliskin, J. S. and Pass, S., 2018. *The Hospital and Clinic Improvement Handbook: Using Lean and the Theory of Constraints for Better Healthcare Delivery*. New York: Oxford University Press

Sengupta, Mitali, et all., 2019. Waiting Time: The Expectations and Preferences of Patients in a Paediatric OPD. *Journal of Health Management*, 21(3) 427–442.

Sun, Jing., et all., 2017. Reducing Waiting Time and Raising Outpatient Satisfaction in a Chinese Public Tertiary General Hospital- an Interrupted Time Series Study. *BMC Public Health*; 17:668.

Suryana, Danyel , 2018. Efforts to Reduce Drug Waiting Time for Outpatient Patients with Lean Hospital Analysis in Outpatient Pharmacy Installation at Atma Jaya Hospital. *JurnalAdministrasi Rumah Sakit*. 4(2)

Turnip, A., Andrian, Turnip, M., Dharma, A., Paninsari, D., Nababan, T., Ginting, C.N., 2020. *An application of modified filter algorithm fetal electrocardiogram signals with various subjects,* International Journal of Artificial Intelligence, vol. 18, no., 2020.

Wijaya, C., Andrian, M., Harahap, M., Turnip, A., 2019. *Abnormalities State Detection from P-Wave, QRS Complex, and T-Wave in Noisy ECG*, Journal of Physics: Conference Series, Volume 1230, (2019) 012015. doi:10.1088/1742-6596/1230/1/012015.

Wu, Nai-Chun, et all. 2018 The Revolution of Hospital Outpatient Pharmacy Fill Prescription Operation Pracedure Reform. Management Review. Vo. 37, 147-167

Xie, zhenzhe., Or, Calvin., 2017. Associations Between Waiting Times, Service Times, and Patient Satisfaction in an Endocrinology Outpatient Departement : A Time Study and Questionnaire Survey. *The Journal of Healthcare Organization, Provision, and Financing*; 54: 1-10.