A Root Cause Analysis of Prolonged Waiting Times for Compounded Prescriptiobs at an Indonesian Private Hospital

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Abstract

Background: Waiting times have been shown to contribute to patient satisfaction with hospital services. Previous studies investigated long waiting times in the hospital, one of which was the time it takes to prepare compounded prescriptions in pharmacy unit. However, few studies have explored the main causes of prolonged waiting times for compounded medications in the hospital. This study aimed to understand the causal factors that influence prolonged waiting times for compounded prescriptions in Indonesian private hospital. **Methods:** A root cause analysis was used to identify the root cause of a reoccurring issue in pharmacy unit. Data were collected from hospital documents, observations, and interviews of 15 representatives from the hospital directors, head of pharmacy department, purchasing staff, pharmacy storage manager, other pharmacy staff, and service quality manager. **Results and Discussions:** This study identified possible causes of prolonged waiting times for compounded prescriptions which include drug shortage, human resources shortage, waiting times for drug preparations, and duration of health insurance coverage confirmation. In addition, this study determined the actual causes of the problem, such as managerial, and health insurance factors which in turn provide suitable recommendations and solutions. **Conclusion:** It can be concluded that there were four key factors to the success of hospital pharmacy services: drug and human resources management, waiting times for drug preparations, and duration of health insurance coverage confirmation. It is recommended that hospital management could optimize drug formulary management, improve coordination in drug distribution system to patients, and redesign waiting room in the hospital.

Keywords: *Root Cause Analysis, Waiting Times, Compounded Prescriptions, Private Hospital*

Introduction

Pharmaceutical services play an important role on preventing medication errors in the hospitals by preparing drug prescriptions, monitoring, and evaluating side effects of drugs[(1)]. Many factors influenced the quality of hospital services including prolonged waiting time when pharmacists and pharmacy technicians prepare medications. A study by Alam *et al*. revealed a variety of factors related to prolonged waiting time in the pharmacy unit, such as employee management system, employee workflows, available resources, and pharmacy unit design[(2)]. Competent pharmacists, drug insurance coverage, heavy workloads, and pharmasicts' skills in managing prescriptions were also main problems affecting the quality of pharmacy services[(3)].

There were four major big issues that pharmacists face right now: (1) difficulties in reading medical doctors' prescriptions as they are manually written, (2) unavailability of patient classification and coordinating care for patients with complex needs, (3) the pharmacy unit need to provide services for all patients in the hospital, (4) a lot of unclaimed prescriptions which might affect waiting time, and (5) poor pharmacy unit

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design[4]. In addition, Fauzia *et al.* stated that heavy workloads in pharmacy unit influenced patient waiting time[5]. Besides that, prolonged waiting time happened due to the fact that there were incomplete information with regards to drug prescriptions and drug shortage (70%), incorrect drug doseages (7.61%), and inadequate drug instruction (8%)[6]. Therefore, a better quality management tools is needed to improve the efficiency of pharmacy services.

Waiting times have been shown to contribute to patient satisfaction with hospital services. Previous studies investigated long waiting times in the hospital, one of which was the time it takes to prepare compounded prescriptions in pharmacy unit[5],[7]. However, few studies have explored the main causes of prolonged waiting times for compounded medications in the hospital. This study aimed to understand the causal factors that influence prolonged waiting times for compounded prescriptions in Indonesian private hospital.

Materials and Methods

The pharmacy unit provides pharmaceutical services for inpatients and outpatients in the hospital. A root cause analysis was used to identify the root cause of a reoccurring issue in pharmacy unit. Additionally, a root cause analysis is a strategic approach to understand the causal factors and determine potential solutions[8]. Data were collected from hospital documents, observations, and interviews in a face-to-face setting of 15 representatives from the hospital directors, head of pharmacy department, purchasing staff, pharmacy storage manager, other pharmacy staff, and service quality manager. Interviews and observations were conducted as an approach to understand the causal factors that influence prolonged waiting times for compounded prescriptions in Indonesian private hospital. Data were then extracted, summarized, and analyzed to identify the key points. Hospital documents were other forms of data which provided factual information as a basis for reasoning in root cause analysis.

Results and Discussion

The results of the study explained the pharmaceutical care services which include the management of pharmaceutical preparations (selection, planning of needs, procurement, reception, storage, distribution, destruction and withdrawal, control, and administration), and clinical pharmacy services (assessment and prescription services, tracking drug use history, drug reconciliation, drug information services, counseling, patient visits, drug therapy monitoring, drug side effects monitoring, drug use evaluation, sterile dispensing supplies, and monitoring blood drug levels). Some types of services developed in accordance with quality management were new inpatients visits, Dose Dispensing Unit (DDU), and Pharmacy Intravenous Admixture Service (PIVAS).

This study identified possible causes of prolonged waiting times for compounded prescriptions which include drug shortage, human resources shortage, waiting times for drug preparations, and duration of health insurance coverage confirmation. In addition, this study determined the actual causes of the problem, such as managerial, and health insurance factors which in turn provide suitable recommendations and solutions.

Table 1 showed the average number of patients per day within the last five years from 2015-2019, in which both outpatient and inpatient service users continue to increase. Pediatric Clinic accounts for the highest number of patients among all clinics, and the number was relatively stable. Growth and Development Clinic which provides services for children also continues to increase. Those who visited these two clinics were generally private health insurance customers. Hospital management maintained patient loyalty by developing image of the hospital, so various efforts were made to increase patient satisfaction, including waiting time in compounding prescriptions. Doctors in the Neurology and Medical Rehabilitation Clinic also often prescribe drugs in the form of capsules, because most of the patients were elderly who need dosage adjustments, either due to decreased organ function or due to polypharmacy tendencies.

Table 1: Average Number of Patients Per Day

Year	Obstetric Gynecology Clinics	Pediatric Clinic	Dental Clinic	Medical Rehab Clinic	Growth & Development Clinic	Neurology Clinic	Other Types of Clinics	Emergency Department
2015	53.9	97.39	19.38	16.92	11.71	0.8	42.38	50.45
2016	53.96	105.75	28.13	17.4	13.79	0.85	41.34	60.78
2017	62.07	108.56	32.8	40.76	20.37	1.81	49.93	65.55
2018	69.59	104.57	41.44	56.74	29.74	13.84	125.43	70.44
2019	63.81	110.85	45.29	95.41	39.72	46.36	258.31	85.78

Table 2: Indicators of Hospital Service Quality

Year	Categories				
	Number of Beds	Bed Occupancy Ratio (%)	Turn Over Interval	Average Length of Stay	Net Death Rate (%)
2015	69	52.38	3.31	3.6	2.8
2016	69	67.94	1.76	3.7	4.3
2017	85	50.56	3.37	3.35	2.86
2018	95	51.96	3.02	3.05	3.62
2019	95	62.71	1.71	2.87	1.39

As can be seen in Table 2, the number of beds provided by the hospital and the level of hospital service quality also continues to improve. With the increase in the number of patients undergoing hospitalization, the pharmacy staff workload also increased, especially for patient visits, DDU, and PIVAS. Along with the increased utilization of hospital services, the quantity of activities in this pharmacy unit has also increased.

Table 3: Productivity Growth of Pharmacy Unit in 2015-2019

Year	Number of Clinical Pharmacists	Number of Pharmacist Technicians	Average Number of Prescriptions Per Day	Private Health Insurance Prescrip-tions	Public Health insurance Prescrip-tions	Inpatient DDU/ PIVA* (item/ day)	New Inpatient Visits Per Day
2015	3.5	12	546	-	-	11.87	2.9
2016	4.5	14	642	-	-	13	3.76
2017	5.5	17	659	1.02	17.25	16.13	3.9
2018	5.5	21	930	6.54	116.73	17.67	5.3
2019	6.5	21	1,459	4.12	193.04	20.63	10.72

*DDU/PIVA: Dose Dispensing Unit /Pharmacy Intra Venous Admixture Service

Table 3 illustrated productivity growth of pharmacy unit in 2015-2019 and several other pharmaceutical activities. In 2015, pharmacists were responsible for managing 546 prescriptions per day, in 2019 increased to 1459 prescriptions per day. In addition, there are currently additional tasks in the form of inpatient visits, UDD, and PIVAS.

A root-cause analysis in Malaysia showed several root problems that result in prolonged waiting times in pharmacy services: (1) the number of inexperienced human resources who do not understand the workflow, (2) lack of human resources, (3) the number of clinics that operating at the same time, (4) handling prescription errors, (5) poor steps in the dispensing procedure to ensure its safety, and (6) the presence of drugs that require special treatment, such as psychotropics that require separate records[9]. Meanwhile, a study in Indonesian hospital showed that the process that required adequate human resources in pharmaceutical services was drug preparation. The lack of available human resources causes medication errors and extends queue time[10].

Meeting the needs for facilities and infrastructure at the X Hospital Pharmacy Installation, such as the expansion of the compounding area and Pharmacy Warehouse, also requires a large amount of cost. Preparation in this direction has been carried out by the Management of RS X, and will be completed in 2020. Because of that, now another alternative solution is needed to overcome the problem of not achieving the standard time for the provision of this powder.

Arrangement of human resources work schedules, electronic prescribing, redesign of service workflows were carried out in several countries in an effort to reduce waiting times for pharmaceutical services. In Malaysia, Value Added Service (VAS) has been proven to increase the number of patients receiving services in less than 30 minutes, from 83.2% to 90.3% after being promoted massively within 6 months. VAS is a collection of innovative dispensing systems that provide options for patients to take their medicine. Broadly speaking, this consists of the Integrated Drug Dispensing System (SPUB), Drive Through Pharmacy, Courier Service, and SMS and Take Service[9]. Reducing pharmacists workload and enhancing doctors' manual prescriptions could considerably decrease medication errors as well as increase the quality of drug prescriptions[11-13]. Managing heavy workload in pharmacy unit is not easy, therefore a multidisciplinary teamwork is important to manage the issues. We need competent pharmacists to perform specific tasks and manage the complex process in the pharmacy unit[14-19]. Redesign waiting room in the pharmacy unit could affect overall patient experience in the hospital. The entire space in this room should incorporate comfort components such as sunny and clean rooms, comfort furniture and layout, visual and audio stimulation to calm patients and families[20].

Various things above can be considered by hospital management tpolicies and procedures to improve patient satisfaction in relation to pharmaceutical services. Based on the existing situation and conditions, it can be recommended several solution options that can be further studied: drug formulary management, improve coordination in drug distribution system to patients, and redesign waiting room in the hospital. After implementing potential solutions, it is suggested that the hospital management should make an analysis of its impact on the hospital standards to be achieved. This will be a documentation of best practices that can be used by other hospitals that face similar problems.

Conclusion and Acknowledgement

It can be concluded that there were four key factors to the success of hospital pharmacy services: drug and human resources management, waiting times for drug preparations, and duration of health insurance coverage confirmation. It is recommended that hospital management could optimize drug formulary management, improve coordination in drug distribution system to patients, and redesign waiting room in the hospital. We would like to express our gratitude to Master Program of Hospital Management, Faculty of Medicine, University of Brawijaya, and Dr. Radjiman Wediodiningrat Lawang Psychiatric Hospital for their support during the study.

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References

1. Schlaifer M, Rouse MJ. Scope of Contemporary Pharmacy Practice: Roles, Responsibilities, and Functions of Pharmacists and Pharmacy Technicians. Journal of Managed Care Pharmacy 2010;16(7):507–508.
2. Alam S, Osama M, Iqbal F, Sawar I. Reducing pharmacy patient waiting times. International Journal of Health Care Quality Assurance 2018;31(7):834-844.
3. Sadi BA, Harb Z, El-Dahiyat F, Anwar M. Improving patient waiting times: A quality initiative at a pharmacy of a public hospital in United Arab Emirates. International Journal of Healthcare Management 2019;1–6. doi: 10.1080/20479700.2019.1692768.
4. Alodan A, Alalshaikh G, Alqasabi H, Alomran S, Abdelhadi A, Alkhayyal B. Studying the Efficiency of Waiting Times in Outpatient Pharmacy. MethodsX 2020;7:100913.
5. Fauzia U, Setiawati EP, Surahman ES. Analysis of Waiting Times for Filing Prescriptions in Hospital Pharmacy. Pharmacology and Clinical Pharmacy Research 2017;2(3):75-78.
6. Sa´nchez AM, Campos RM. Detection of prescribing related problems at the community pharmacy. Int J Clin Pharm. 2011;33:66–69.
7. Kautsar AP, Nurhayati NR, Gozali D. Effect of prescription waiting times on patient satisfaction mediated by service quality of pharmacy unit in public hospital in Bandung city. Arabian Journal of Chemistry 2017;10:S1409–S1421.
8. Okes D. Root Cause Analysis: The Core of Problem Solving and Corrective Action. 2nd edition. Milwaukee, Wisconsin: ASQ Quality Press; 2019.
9. Loh BC, Wah KF, Teo CA, Khairuddin NM, Fairuz FB, Liew JE. Impact of value added services on patient waiting time at the ambulatory pharmacy Queen Elizabeth Hospital. Pharm Pract (Granada) 2017;15(1):1–8.
10. Sujoko A, Chalidyanto D. Analisis Antrian Pelayanan Obat Non Racikan Di Instalasi Farmasi Rawat Jalan. J Adm Kesehat Indones. 2015;3(2):99–107.
11. Shao S-C, Chan Y-Y, Lin S-J, Li C-Y, Kao Yang Y-H, Chen Y-H, et al. Workload of pharmacists and the performance of pharmacy services. PLoS ONE 2020;15(4): e0231482.
12. Costa DGda, Pasin SS, Magalhães AMMde, Moura GMSSde, Rosso CB, Saurin TA. Analysis of the preparation and administration of medications in the hospital context based on Lean thinking. Escola Anna Nery 2018;22(4):e20170402.
13. Al-Arifi MN. Community pharmacists' attitudes toward dispensing errors at community pharmacy setting in Central Saudi Arabia. Saudi Pharmaceutical Journal 2014;22(3):195–202.
14. Jellinek SP, Cohen V, Fancher LB, Likourezos A, Lyke M, Peterson K, et al. Pharmacist Improves Timesly Administration of Medications to Boarded Patients in the Emergency Department. Journal of Emergency Nursing 2010;36(2):105–110.
15. Jacobs S, Bradley F, Elvey R, Fegan T, Halsall D, Hann M, et al. Investigating the organizational factors associated with variation in clinical productivity in community pharmacies: a mixed-methods study. Health Serv Deliv Res. 2017;5(27):1-217.
16. Penm J, Moles R, Wang H, Li Y, Chaar B. Factors Affecting the Implementation of Clinical Pharmacy Services in China. Qualitative Health Research 2014;24(3):345–356.
17. Hawthorne N, Anderson C. The global pharmacy workforce: a systematic review of the literature. Human Resources for Health 2009;7(1):48.
18. Koehler T, Brown A. A global picture of pharmacy technician and other pharmacy support workforce cadres. Res Social Adm Pharm. 2017;13(2):271-279.
19. Bates I, John C, Bruno A, Fu P, Aliabadi S. An analysis of the global pharmacy workforce capacity. Human Resources for Health 2016;14(1):61.
20. Jiang S, Powers M, Allison D, Vincent E. Informing Healthcare Waiting Area Design Using Transparency Attributes: A Comparative Preference Study. HERD: Health Environments Research & Design Journal 2016;10(4):49–63.