Analysis of Waiting Time for Filing Prescriptions in Hospital Pharmacy

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Abstract

Patient waiting time for healthcare services is identified by the World Health Organization (WHO) as one of the key measurements of a responsive health system. Waiting time for filing prescription can influence patient satisfaction on hospital pharmacy service. This study was conducted to analyze current condition of waiting time for filing prescription and related parameters. This study was prospective cross-sectional study conducted for 10 days at a hospital pharmacy, in Indramayu, Indonesia. Data regarding distribution of patients flow was obtained. Statistical analysis was performed using Kolmogorov-Smirnov. We observed that this hospital uses single queue channel-single phase model in three counters, i.e., public health insurance (PHI), private/general, government insurance (GI). The rate of patients visit was (λ) 9.40 and the rate of service was (µ) 1.26 in PHI. In private/general counter, the rate of patients visit was (λ) 5.03 and the rate of service was (µ) 4.08. The rate of patients visit was (λ) 4.85 and the rate of service was (µ) 5.85 in GI. Data indicated that there was excessive work loads. Thus, several strategies should be performed to decrease waiting time, e.g., the use of computer-based queuing system and the improvement of quality and quantity of human resources in the hospital pharmacy.

Keywords: waiting time, outpatient, queueing theory.

Introduction

Patient waiting time for healthcare services is identified by the World Health Organization (WHO) as one of the key measurements of a responsive health system. There are 6 goals that should be achieved in to improve quality of health services, including safe, effective, patient-centered, timely, efficient, and equitable. Waiting time for filing prescription is one of the factor that can influence patient satisfaction on hospital pharmacy service. Patients may easily get tired and impatient when queuing too long for drugs before leaving hospital.1-3
Timely services are important in pharmaceutical care to ensure that patients consumed the drugs in appropriate time. Therefore, this study was conducted to analyze current condition of waiting time for filing prescription and related parameters in a hospital pharmacy at Indramayu, Indonesia. The results of this study can be used to develop strategies to reduce waiting time are expected to be followed up in order to increase the waiting time for prescription services.

Methods
This prospective cross-sectional study was conducted at a hospital pharmacy in Indramayu, Indonesia. Distribution of patients flow in the counter for public health insurance (PHI), private/general, and government insurance (GI) counters were obtained. The data included the rate of incoming prescriptions, prescription type, and waiting time. We included the prescriptions during 08.00 am - 02.00 pm during 10 days. Prescriptions was divided into two types 1) non-compounding 2) with compounding.

Queue parameter was calculated using queuing model \((M/M/c):(GD/\infty/\infty)\). Statistical analysis was performed using Kolmogorov-Smirnov.

Results and Discussion
We observed that this hospital uses single queue channel-single phase model in three counters, i.e., public health insurance (PHI), private/general, government insurance (GI). The rate of patients visit was \((\lambda)\) 9.40 and the rate of service was \((\mu)\) 1.26 in PHI. In private/general counter, the rate of patients visit was \((\lambda)\) 5.03 and the rate of service was \((\mu)\) 4.08. The rate of patients visit was \((\lambda)\) 4.85 and the rate of service was \((\mu)\) 5.85 in GI.

Table 1, 2, and 3 shows the queue parameter calculation in PHI, general, and GI, respectively. In two former counters, the rate of patients visit compared to service rate was greater than one, indicating there was overload work in both counters. The complete queue parameters could not be calculated for

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<th>Table 1. Patients flow in PHI counter</th>
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<th>Table 2. Patients flow in general counter</th>
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these counters. In the GI counter, the number of queue in average was 4.85 ~ 5 people and waiting time was approximately 1-0.83 hours. The work utility of the counter was 83% with 17% disrupt probability. Although there was no work overload, the waiting time was considerably long.

Determination of queuing structure is needed to understand the current condition of queuing system. In two counters, the rate of patients visit exceeded the rate of service, explaining the reason of long queue in these counters.

In developed countries, this can be solved by making arrangement for health service, including consultation with physicians and filling the prescriptions. Therefore, there would be no accumulation of patient visits in certain hours. However it requires established system and commitment from many stakeholders.6

There are several factors which caused the long waiting time, including lengthy dispensing procedures and lack of human resources both in quantity and quality due to excessive work hours. Re-orientation of the employess could be useful to increase the work performance of the employee. The addition of employee also could increase service rate and increase patient satisfaction.7

When service demand exceeds the service capacity, instead of queuing up, the patient might choose to leave The phenomenon is called service reneging. Reneging can be prevented by redesigning the queuing system, e.g., by increasing the number of counters. The addition of counters proved to reduce patient waiting time and total costs incurred due to waiting time.14,15 Besides, computer-based queuing system will improve the efficiency, particularly during registration. In addition, patients can see their respective queue numbers, so they can estimate the queue waiting time and thus reduce the accumulation of patients in the waiting room.

The redesign of pharmacy outpatient installations also influences the waiting time of prescription service and patient satisfaction.8 When the pharmacists are placed in a location outside the dispensing area, they can communicate with each patient before drugs dispensing process started.9

Discipline in the service should also be implemented. Patients who come first are patients who are served first, unless for patients who have more serious medical conditions10,11

### Conclusion

Several strategies should be performed to decrease waiting time, e.g., the use of computer-based queuing system and the improvement of the quality and quantity of human resources in the hospital pharmacy,

### Acknowledgement

None.
Funding
None.

Conflict of Interest
None declared

References