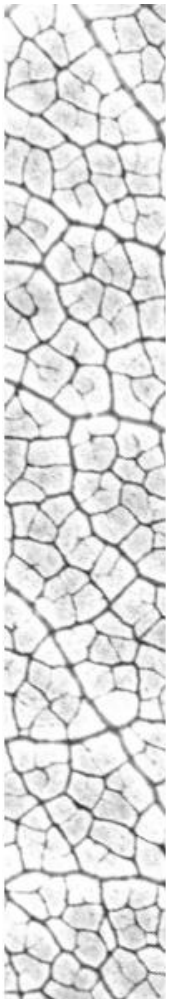

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Constraints in provision time of hospital medical record documents

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Abstract
Waiting time in the provision time of hospital medical record documents remains to be an issue to be solved. This study aimed to analyze the long-time provision for outpatient medical records based on the theory of constraints (TOC). An observational study with cross-sectional design used the TOC method. The constraint was found in the process of medical record document provision, the longest average time on the process of provision of outpatient medical records document was the medical record document examination process with an average of 48.91 minutes, and a total time of provision of medical record document was 54.86 minutes. The TOC considers a problem as an opening way for the rest of the system to be managed. An overall management system in accordance with the constraints on the system would reach a steady groove.

Keywords: medical record, waiting time, theory of constraint

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INTRODUCTION

Medical record service is part of the hospital quality control program, for it should be a standard procedure for assessing the quality of services and manage the occurring problems. Manufacture of medical record documents is a necessity for every health care institution. The implementation of medical records documents at hospitals, which are registration, data storage, and processing of medical record document (Departemen Kesehatan Republik Indonesia 2006). Medical record document is a file containing records and documents about patients' identity, examination, treatment, action, and other services given to the patients. Every hospital should make a good medical record document consisting of outpatient or inpatient medical record documents (PERMENKES RI No 269/MENKES/PER/III/2008 2008).

The problem in this research is the high percentage of outpatient medical records with the time to provide medical record documents not in accordance with standard <20 minutes by 65.15% in 2017. Quality is a fundamental factor affecting customer preference of different services, which contributes to the company's performance and development. Nevertheless, in hospitals, the treatment infrastructure is not perfect and is not guaranteed to provide effective community support. Quality of service is related to satisfaction of patients (Tuami, Indahwaty Sidin, and Zulkifli 2018). Health service quality is considered to be good if it is supported by medical records that are able to retrieve documents quickly and on time in accordance with an approved hospital (Otieno et al. 2007).

Waiting time on health treatment has been reported as one of the factors that makes the level of frustration in patients increase and is regarded as an obstacle in one's activities. Making patients wait can cause stress, both to the doctors and patients (Akbar et al. 2019). In health care organizations, doctors and nurses are the main service providers who benefit directly or indirectly from electronic documentation systems other than patients. Health experts have recognized that the ability of nurses and doctors to use electronic documentation is significantly very effective in-patient care and improving patient welfare, reducing costs for training, and reducing health care costs (Simamora 2019). The need to provide quality health care can be maximized against patients, and it is possible to reduce health care costs and overcome the problem of lack of limited nursing staff resources (Pardede et al. 2019).

The key factors influencing customer and consumer satisfaction are waiting time and consultation duration. The average waiting time in Malaysia is about 1-2 hours

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in the hospital outpatient department. The experience of waiting will also impact the satisfaction of the customer. The quality and attractiveness of the waiting room are affected by certain influences (Ariffin, Azraii, and Kamaruddin 2017). Consumer's satisfaction is generally based on product quality, price, service quality, emotional factor, the ease and comfort of services provided by the company (Fadli et al. 2018). The electronic model has a small increase in the risk of readmission and death prediction but has no significant impact on the service risk alone. This indicates that substantial risk stratification for readmission risk at patient levels will arise without waiting at an early stage of the hospital stay (Amarasingham et al. 2015). Minimum Service Standards (MSS) for medical records consist of (a) the completeness of medical records documents 24 hours after the service is completed, (b) completeness of informed consent after getting a clear information, (c) a provision of outpatient medical records documents, and (d) a provision of inpatient medical records documents. This research aimed to analyze the long-time provision for outpatient medical records based on the theory of constraints (TOC).

METHODS

Research design, population, samples, and variables

This study used observational research design with cross-sectional design. These observed activities are activities that officers do, specifically real activities provided for officers. Total resource in this study was a document of outpatient medical records taken from the total outpatient visits and medical rehabilitation in December 2017, for about 18.506 documents. Then, the samples were obtained by the formula:

$$n = \frac{Z^2_{1-a/2}\, p(1-p)N}{d^2(N-1) + Z^2_{1-a/2}\, p(1-p)}$$

$$n = \frac{1{,}96^2\ x\ 0{,}65\ (1-0{,}65)\ x\ 18.506}{0{,}1^2(18.506-1) + 1{,}96^2\ x\ 0{,}65\ (1-0{,}65)}$$

$$n = \frac{16.166{,}84}{185{,}92}$$

$$n = 86{,}96$$

Based on the result of the calculation, the obtained samples reached 87 numbers of documents. T avoid dropouts, the documents were added up to 100 documents, with certain criteria: 1) medical records documents about cardiologists, internists, medical rehabilitation, neurosurgeons, and dentists and oral surgeons, 2) medical record documents of patients who had a current visit during the research, 3) there was no student job training when the research was done because there would be a possible bias in the calculation of time ensuring outpatient medical records documents. Meanwhile, the subjects of this study were 17 respondents. The selection of the subjects was purposive; the researchers chose participants themselves who could contribute to the research in accordance with the information to be obtained.

Instruments

The instruments in this study were in-depth interviews, observation, and group discussions. In-depth interviews to the official medical record (17) are associated in the process of ensuring provision of outpatient medical records. Observations made was an active participation of researchers participating in any activities at this stage of provision medical record documents process. Group discussions were conducted to determine the cause of the priority constraints in the process of ensuring provision of outpatient medical records

Research procedures and analysis

The procedure of the research was done in collaboration with the medical record personnel who was associated with the provision of outpatient medical record document and the admission officer. Data analysis in this study was collected by listening to the in-depth interviews and group discussion results, then the researcher wrote the results in the form of a transcript. The results of the observation of the records and the camera were also written in the form of transcript. The steps were taken including data reduction, data display, and verification.

RESULTS

The process of provision of medical record documents consists of outpatient admissions / registration, examination, and restoration. Based on **Table 1**, the process of ensuring provision of outpatient medical records needs a long time, particularly the stage of registration in a new patient generally for about 23.1 minutes, the stage of document examination of medical records of an old national health insurance patient for about 54.75 minutes, the restoration stage, and medical records documents <1 days for an old or a new national health insurance patient (100%). There was a document discovery stage of outpatient medical record documents for an old or new national health insurance patients as an assembly outpatient medical record document, because there was no medical record document examination process. The longest average time on the process of provision of outpatient medical records document was the medical record document examination process with an average of 48.91 minutes, and a total time of provision of medical record document was 54.86 minutes. It indicates that the time of provision of outpatient medical record document exceeded the standards (<20 minutes), which had been determined by the hospital.

Table 2 shows that the service flow ensuring provision of outpatient medical records is done by comparing the time of service standards with the time of

Table 1. Duration of Provision of Outpatient Medical Record Documents Based on Types of Patients in Hospitals in 2018

Process for Providing Medical Record Documents	Type of Patient												Average Time*	Total Time*
	New NHI			Old NHI			New General Patient			Old General Patient				
	Time*	n	Average*	Time*	n	Average*	Time*	n	Average*	Time*	n	Average*		
Patient admission/ registration	188	12	15.67	69	69	1	231	10	23.1	105	9	11.67	5.93	
Search and assembly of medical record documents	279	12	23.25	3778	69	54.75	361	10	36.1	473	9	52.56	48.91	54.84
Return of medical record documents	<1 day	12	100%	<1 day	69	88.4%	<1 day	10	80%	<1 day	9	100%	<1 day	

*minutes

Table 2. Constraints on the Process of Providing Outpatient Medical Record Documents in Hospitals in 2018

Process for Providing Medical Record Documents	Min*	Max*	Average Time*	SD*	Total Time*	Target*	Category Constraints
Service time for patient admission / registration	1	5	1.72	1.17			Not a constraint
Waiting time for the driver to fill the room	0	50	4.17	9.29			Constraints
When searching and assembling medical record documents	4	89	27.59	17.89	54.84	<20	Constraints
Waiting time for distribution	0	82	21.15	18.76			Constraints
Time for returning medical records	0	<1 day	<1 day	0.302			Not a Constraint

*minutes; SD: Standard Deviation

actual service, and it is found that the main problems of the length of time ensuring provision of outpatient medical records are: 1) the waiting time from slips into space filling room, 2) examination and assembly time (for new patients) medical record documents, and 3) the distribution of waiting times.

DISCUSSION

Health service facilities have many problems. For instance, they have convoluted administration procedures, long queue traffic, inaccurate and incomplete patient data, unclear information, etc. (Adian and Budiarto 2020). Electronic medical records is a recording or electronic record of a person's health information, created, collected, managed, used and referred by a doctor or health worker who is entitled in a health care organization (Alliance 2008). The benefits and impact of the implementation of electronic medical record are to improve the productivity of health care providers and hospitals, to make the communication better as well as the flow of information and clinical decision to be better, to obtain data accuracy, to improve the quality of care (patient satisfaction, satisfaction of service providers, improving confidentiality and information security, and to increase the accountability of funds and supplies (Waithera, Muhia, and Songole 2017). There are several aspects to be considered in the implementation of electronic medical record. They are the system of patient identification and provision of medical record number, the flow process of the patient and the document of the patient, and the policy in the service of medical activities (Noraziani et al. 2013).

This study showed that the standard time provision of outpatient medical record document was about ≤ 10 minutes (Indonesia, 2008). The time ensuring provision of outpatient medical records from the registration process up to medical records documents was provided/discovered by the officers. Meanwhile, the target of the hospital in the provision of outpatient medical record document was <20 minutes. The time ensuring provision of outpatient medical records was from the registration process up to medical records documents out of the room.

In this study, the first stage of the observation results of providing outpatient care was registration process. In this process, the slip waiting time were taken and brought to the filling space for 4.17 minutes, and the average service registration time required was 1.72 minutes. The second stage was the outpatient examination process. In the examination process, the waiting time process occurred after being distributed for 21.15 minutes, and the average time required in the examination process was 27.59 minutes. The third stage was a process that could affect the timing provisions of outpatient medical record documents, which was the process of restoration from the specialist. In the average, it took for about <1 day.

The process of ensuring provision of outpatient medical records at the hospital involves several parts on the unit records. Furthermore, each participant may affect the service process. According to the Regulation of the Minister of Administrative Reform and Bureaucratic Reform, the number of medical recorder in Class B General Hospital consists of 10 experts (Indonesia 2013). Meanwhile, in this study, the hospital had only 4 people. Thus, the number of medical recorders at the hospital were still not appropriate with the number of officers based on its standard.

One method of quality improvement in addressing waiting time is a TOC. TOC is a method of management control to improve the quality of services in a sustainable process to overcome the existing obstacles. TOC explains that the performance of an organization must be limited by at least one constraint (Şimşit, Gunay, and Vayvay 2014). TOC focuses on the elements limited to the performance in increasing the output (Pretorius 2014). The processes in TOC include the analysis of

cause-effect-cases, verifying the allegations, the exploration of alternative solutions, and the repairing process (Marton and Paulova 2010). TOC considers a problem as an opening way in which the rest of the system should be managed. Overall management system accordance with the constraints on the system may reach a steady groove. The selection of a solution to the problems identified by the TOC is to overcome with the lowest cost (Groop, Reijonsaari, and Lillrank 2010).

The constraint on providing outpatient is the examination and assembly time as well as the waiting time. The waiting time consists of registration waiting time and the distribution of waiting time. Registration waiting time is the condition after printing the slips. Meanwhile, the distribution of waiting time occurs after the tracer occurs. Everybody is eligible to the highest possible care in the health center. The reduction of long waiting periods is one of the most effective tools for enhancing the efficiency of the health service (Geng and Xie 2016). TOC uses five measures to enhance corporate accomplishment by recognition of the constraints of the enterprise, manipulation of the limits, subordination of all else to decisions in phase 2, advancement of the constraints of the organization, and the repeated cycle as new restraints that hinder output (Pertiwi and Rochmah 2019). The waiting time allocation in the hospital services is one indicator of the quality of hospital services. Minimizing waiting time allocation for the patient is important in order to make them satisfied with the services provided by the hospital.

One of the processes of Goldratt's constraint theory is the restriction identification process. When evaluating which resources are the constraint, an optimization method is required. There are two methods for the identification of the constraint; flow process diagram and an approach to time analysis. For each stage in a framework, a flow diagram template is widely used (Pertiwi and Rochmah 2019). The waiting time in the provision of medical record documents may affect outpatient services. This is because the provision of medical record documents process begins from the registration process as one of the obstacles for a long awaiting time. When the patients enter the registration section, it takes some time to get in the information and queue to each specialist. After that, the officers will seek out and distribute the documents to the specialist medical records. If the document is not yet available, the patients will not get the services. Hence, if the process of providing medical record document is long, the increased waiting time of outpatient care will occur.

The results are consistent with the factors leading to long waiting time, for example, the lack of human resources and professional workers in hospitals, such as doctors, licensed nurses and other professional staff, and the information systems used in hospitals (Fitzpatrick et al. 2014). Lack of professional officers', in this case, with the educational background of 3-year diploma of medical records and the information systems used are frequently encountered errors, which may cause a document providing outpatient medical records became longer. However, this is not in accordance with the study stating that to create a long waiting time, 80% factors lead to long waiting times, for example, the registration process, the shortage of doctors, and the shortage of professional staff (Mohseni et al. 2014).

The limitation in this study is the lack of time standard at each stage of the process ensuring provision of outpatient medical records. In addition, there are many methods that could be used to solve the problem of time ensuring provision of outpatient medical records. In this study, we used TOC method.

CONCLUSION

The flow of outpatient medical record document provision is in accordance with the existing procedures at the medical record implementation guidelines, but it is not in accordance with the standard operating procedure because in some carried-out, none of them had the standard operating procedure. The waiting time allocation in the hospital services is one indicator of the quality of hospital services. If the patient is satisfied, it is more likely for them to reuse the services on those hospitals.

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