Cost Control Recommendation Based on Activity-Based Management: A Case Study from Decreasing Opportunity Cost of National Health Insurance

Lutfiana Rakhmawati[1*)], Sony Wijaya[1], Nyoman Anita Damayanti[1], Thinni Nurul Rochmah[1]

[1] Department of Health Policy and Administration, Faculty of Public Health Universitas Airlangga

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A B S T R A C T

Background: Opportunity cost is a loss caused by either income or other activities that are not carried out and can potentially be lost due to waiting for prescription services. In the hospitals in Surabaya, it is known that, the waiting time for patient prescription services that utilise national health insurance in outpatient pharmacies exceeds the minimum service standards. Aims: to analyse the opportunity loss and cost of patients utilising the National Health Insurance from prescription service activities in which the recommendation cost control can be designed. Methods: A case study using an observational approach has been applied concerning activity-based management theory for defining non-value-added activities. Opportunity cost defines as converting the waiting time for prescription services to the income lost while waiting for the prescription. 120 patients who use national health insurance for obtaining prescriptions were recruited. Data were analysed using an observational table and calculated the service process and activity process. Results: Patient's opportunity loss for concoction drugs is 75.01 minutes, chronic non-concoction drugs are 71.14 minutes and non-chronic finished drugs are 46.3 minutes. The patient average opportunity cost based on the type of work and clustered by diseases, namely civil servants (IDR. 125,088 for Concoction Medicine), Pensioners (IDR. 87,800 for all typical medicine), housewives (IDR. 146,500 for all typical medicine), private employees (IDR. 136,878.20 for Concoction Medicine), and self-employed (IDR. 172,624.45 for Concoction Medicine). Conclusions: The findings suggest the recommendation for cost control through optimizing cost management and procurement of incentive programs if opportunity costs fall.

Lutfiana Rakhmawati

Department of Health Policy and Administration, Faculty of Public Health Universitas Airlangga, Surabaya – Indonesia Campus-C, Universita Airlangga Jl. Ir. Soekarno Surabaya 60115

A B S T R A K

Latar Belakang: Opportunity cost adalah kerugian yang disebabkan oleh pendapatan atau kegiatan lain yang tidak dilakukan dan berpotensi hilang karena menunggu jasa resep. Di rumah sakit di Surabaya, diketahui bahwa, waktu tunggu layanan resep pasien yang memanfaatkan jaminan kesehatan nasional di apotek rawat jalan melebihi standar pelayanan minimal. Tujuan: untuk menganalisis kehilangan peluang dan biaya pasien yang menggunakan Jaminan Kesehatan Nasional dari kegiatan layanan resep di mana kontrol biaya rekomendasi dapat dirancang. Metode: Studi kasus menggunakan pendekatan observasional telah diterapkan mengenai teori manajemen berbasis aktivitas untuk mendefinisikan kegiatan non-nilai tambah. Biaya peluang didefinisikan sebagai mengubah waktu tunggu untuk layanan resep menjadi pendapatan yang hilang saat menunggu resep. 120 pasien yang menggunakan asuransi kesehatan nasional untuk

Email: lutfiana.rakhmawati-
2021@fkm.unair.ac.id

mendapatkan resep direkrut. Data dianalisis menggunakan tabel observasional dan dihitung proses pelayanan dan proses kegiatan. Hasil: Peluang kerugian P atient untuk obat racikan adalah 75,01 menit, obat non-racikan kronis adalah 71,14 menit dan obat jadi non-kronis adalah 46,3 menit. Rata-rata biaya kesempatan pasien based pada jenis pekerjaan dan dikelompokkan oleh penyakit, yaitu pegawai negeri sipil (IDR. 125.088 untuk Obat Ramuan), Pensiunan (IDR. 87.800 untuk semua obat khas), ibu rumah tangga (IDR. 146.500 untuk semua obat khas), karyawan swasta (IDR. 136.878. 20 untuk Obat Ramuan), dan wiraswasta (IDR. 172.624. 45 untuk Obat Ramuan). Kesimpulan: Temuan menunjukkan rekomendasi untuk pengendalian biaya melalui optimalisasi manajemen biaya dan pengadaan program insentif jika biaya peluang turun.

INTRODUCTION

The pharmaceutical service paradigm has expanded from being only drug-oriented to a patient-oriented service. The patient's expectation of service is the existence of high-quality, fast, and low-priced services (Benoît & Coron, 2019; James, 1999). Long waiting times are the main complaints of patients, especially for patients who use national health insurance. Too many data entry activities for national health insurance patients cause long duration of waiting (Idawati, 2017; Sabarguna, 2007). Duration of waiting is one of the indicators of the quality of prescription service. Patients are satisfied if the waiting time in the prescription service is fast and suit the standards. Some of the factors that contribute to the waiting time for prescriptions include human resources, facilities and infrastructure and policies (Fitriah et al., 2016).

A long duration of waiting can lead to a decrease in patient satisfaction levels and reduce patient comfort which affects patient satisfaction with the services (Fitriah et al., 2016). Inefficient services and a long duration of waiting will cause a loss of patient opportunities in the form of time (opportunity loss). Opportunity loss experienced by patients impacts the loss of opportunity costs and increased service costs (opportunity costs) that must be borne by hospitals. The time it takes to perform an activity is a tipping point because a longer time requires more resources to be used (Sujoko & Chalidyanto, 2015).

A previous study stated that 79.7% of the waiting duration in pharmacies is a delay component (Sujoko & Chalidyanto, 2015). Service delays are caused by drug unavailability, computerised networks, service procedures before optimal and excessive workload (Septini, 2017). This condition shows that it is necessary to arrange prescription service procedures to speed up service; by simplifying the procedure, it is hoped that the need for personnel in the pharmacy will not be too much.

Based on preliminary observations at the research site, information was obtained that the longest time in the drug service process occurred in the drug preparation process. This process involves the highest officer utility, so work in design engineering is required. Work design can be analysed by calculating direct and indirect costs in the prescription service process, one of which is by the activity-based management method (Sujoko & Chalidyanto, 2015). Cost control emphasises financing on various sides of the hospital business by changing the financing system, reorganising financing and controlling financing and every business process activity incurs a cost (Keel et al., 2017; Niñerola et al., 2021).

This study aimed to analyse the opportunity loss and cost of patients utilising the National Health Insurance from prescription service activities at the outpatient pharmacy in which the recommendation cost control can be designed.

METHODS

A case study using an observational approach has been applied in this study concerning activity-based management theory for defining non-value-added activities. We collected the data at a hospital in Surabaya from January to March 2020.

Population and Sample

The population is all prescriptions from outpatients who access the pharmacies services at an Islamic Hospital in Jemursari Surabaya during work hours (from Monday to Friday at around 10:00-14:00). The sample was taken using the basic formula for calculating the proportion estimation sample (Lynn et al., 1993). In this study, the sample used was 120 prescriptions from 120 patients whose inclusion criteria was a patient using one prescription. If in one prescription there is a concoction drug and packaged drug, it will be excluded from the sample.

Instrument and Data

Independent variables included in this study were cost-control recommendations, type of activity, time of implementation of prescription service activities, number of human resources, the total salary of human resources, activity-based management, cost of replacing activities left by patients, respondents' income per month.

As dependent variables, opportunity loss calculated from the time of prescription until the drug is received by the patient. Meanwhile, the opportunity cost will be calculated by converting the waiting time for prescription services to the income lost while waiting for the prescription. The results of the analysis based on activity-based management will obtain activities that are not value-added. Activities that are not value-added and increase waste will cause longer service and patient waiting times. This can cause opportunity loss and opportunity costs and hospitals will be even greater.

Analysis Data

The results of the activity identification are matched with standard operational procedures and policies at the outpatient pharmacy installation of the Islamic hospital in Jemursari Surabaya to determine the presence of activities that are not value-added. *Activity-based management* analysis is used to determine activities that are not value-added. The determination of activities that are not value-added is also through forum group discussions, and there is an element of subjectivity with the following criteria: a) These activities can be eliminated, 2) Activities that can be accelerated by the addition of human resources, 3) Activities that can be done in other units. The service time observation data obtained is directly entered into the observation sheet in a table. The researcher calculates the service process time and the time of each service process activity.

RESULTS

Based on observations of the sample, it can be identified the activities and sub-activities of prescription services for BPJS Kesehatan patients at the outpatient pharmacy. Table 1 identified some activities that were not value-added to the national health insurance patient drug prescription service in outpatient pharmacy. This activity has led to an extension of the time for prescription services, thereby increasing the waiting time for drug services for patients in the national health insurance.

The service time for each type of prescription is different because there are different procedures in each prescription process. From the table, it can be seen that the entry activity in the Nasional Health Insurance system is the longest in

chronic drug prescriptions with a duration of 32.53 minutes, while the longest drug preparation activity is in the prescription of concoction drugs and the greatest opportunity loss is in the type of concoction drugs (75.01 minutes) (Table 2)

Table 1. Activities that do not provide added value in outpatient pharmacy

No	Asset Group
1	Activity of checking the patient's debt book and confirm to the warehouse
2	Activity of asking drugs debt to the patient and confirmation / telephone to the patient
3	Activities to carry out drug requests to pharmaceutical logistics and other pharmacy depots if needed
4	Activity of checking vaccine stock and refrigerator temperature
5	Activity of sending vaccines to the poly room of outpatient specialists
6	Activities of repaying patient debts on the computer
7	Activity of certifying narcotic and psychotropic prescriptions
8	Activity of making weekly reports on prescription narcotics and psychotropics
9	Activity of *closing* sales transactions and cross checking with outpatient cashier sales data
10	Activity of filling out the census and *checklist of* pharmacy depots
11	Activities of documenting and making a bill report for employee prescription deduction (PG)
12	The activity of requesting pharmaceutical depot equipment to the logistics department to make a medical *resume report*

Table 2. The average time of the patient's prescription services

Service Activities of Prescription	Average Time (minutes)		
	Prescription Medication Concoctions	Chronic Prescription Medications	Prescription Non-Chronic Medications
Prescription Reception	7.24	7.16	7.07
Entry the information into National Health Insurance System	10.38	32.53	10.19
Entry information into hospital system	11.73	7.55	8.74
Drug / Medicine Preparation	39.55	17.56	13.84
Drug / Medicine Delivery	6.11	6.34	6.46
Total Time	75.01	71.14	46.3

Table 3. *Opportunity loss* of patients in the form of activities due to waiting for Prescription Services for drugs

Type of Occupation	Opportunity loss	Replacement Costs for Abandoned Activities and Loss of Income That Should Be Earned (IDR)
Civil Servants	Meal allowance, Performance allowance	97,200
Pensioner	Taking grandchildren to school, side jobs (lectures, selling)	87,800
Private Employees	Meal money, bonuses	118,200
Self employed	Daily business income	144,900
Housewives	Cooking, cleaning the house, caring for a child, dropping off schoolchildren	146,500

Opportunity Loss of Nasional Health Insurance Patients

The loss of patient opportunity in time is referred to as patient opportunity loss. Opportunity loss is strongly

influenced by the type of prescription medication received by the patient. It is calculated from the time the prescription is handed over by the patient to the pharmacy officer until the patient receives the medication. Based on the

identification of patient opportunity loss in the form of work, it is known that respondents who are not working still have opportunity loss because there is homework that must be replaced when deciding to come to the hospital (table 3)

Opportunity Cost of Patients with National Health Insurance

Opportunity costs are costs that arise due to the loss of opportunity due to the choice made to carry out other activities. Patients with National Health Insurance waiting for a prescription for the drug to be prepared have the potential to lose revenue as a result of this. This patient opportunity is calculated by converting the time used to wait in rupiah so that the value of the patient's loss due to waiting for drugs can be determined based on the type of work owned by the patient and the income earned from work. If the patient is a child who has not worked, the calculation of opportunity costs is calculated based on the work and

income of family members waiting for the prescription service process. the calculation of the average *opportunity cost* of respondents waiting for prescription of concoction drugs, chronic and non-chronic shows that the highest *opportunity cost* comes from the type of self-employed (IDR172, 624.45, IDR 171, 194.06, IDR 162,012.94 respectively). (Table 4) From these results, it is concluded that the greatest *opportunity cost* in all types of prescription drugs in outpatient pharmacy based on the type of successive work is self-employed, housewives and Private employed.

Cost Control Recommendations

In this study, several recommendations for efforts to control costs at the time of prescription services for patients with national health insurance. In table 5, recommendations are drawn up along with a description of their activities.

Table 4. The average *Opportunity cost* of Respondents Waiting for Medicine

No	Type of Occupation	Average Income/ minutes (IDR) (a)	Average *Opportunity Loss* (Minutes) (b)	Other Income (IDR) (c)	Average *Opportunity Cost* (IDR) (axb)+c
Concoction Medicine					
1	Civil Servants	371.79	75.01	97,200	125,088
2	Pensioner	0.00	75.01	87,800	87,800
3	Private Employees	249.01	75.01	118,200	136,878.20
4	Self employed	369.61	75.01	144,900	172,624.45
5	Housewives	0.00	75.01	146,500	146,500
Chronic Medicine					
1	Civil Servants	371.79	71.14	97,200	123,649.14
2	Pensioner	0.00	71.14	87,800	87,800
3	Private Employees	249.01	71.14	118,200	135,914.57
4	Self employed	369.61	71.14	144,900	171,194.06
5	Housewives	0.00	71.14	146,500	146,500
Non-chronic Medicine					
1	Civil Servants	371.79	46.3	97,200	114,413.88
2	Pensioner	0.00	46.3	87,800	87,800
3	Private Employees	249.01	46.3	118,200	129,729.16
4	Self employed	369.61	46.3	144,900	162,012.94
5	Housewives	0.00	46.3	146,500	146,500

Table 5 Recommendations for cost control in prescription services for health insurance patients

No	Cost control recommendations	Activity Description
1	Optimization of cost management	Conduct training related to cost management to installation leaders and management
		Develop SOPs related to cost control measures to reduce *opportunity costs*
		Develop a system of supervision of the implementation of the cost control program
2	Procurement of incentive programs if *opportunity costs* fall	Develop incentive policies related to reducing costs due to non-value-added activities
		Development of performance appraisal devices and remuneration systems
		Develop periodic evaluation programs for the feasibility of providing incentives

DISCUSSION

The application of activity-based management emphasises the control of activities through activity analysis, namely the process of identifying, explaining, and evaluating various activities carried out by the company (Hansen & Mowen, 2012). Future activity analysis is used to determine what activities contribute to the hospital and what activities do not contribute to the hospital.

Based on findings, it is known that the average service time for concoction drugs is 75.01 minutes, the average time of chronic drug service is 71.14 minutes, and non-chronic drug service is 46.3 minutes. This time does not meet the duration of waiting for prescription services. Long service times can cause various negative impacts for both the hospital and patients. The time it takes to perform an activity is important in which long periods usually mean more

resource usage and less ability to respond to customer needs (Hansen & Mowen, 2012).

The duration of waiting in this study is different from the secondary data. Secondary data showed a longer time than the study's findings due to changes in the number of human resources, changes in flow and increasing performance of pharmaceutical installation services at the Islamic hospital in Jemursari Surabaya. Long service times show poor service quality and can make patients dissatisfied. This experience affects the behavioural intention of the market to return to get services in the future (Amin & Nasharuddin, 2013). The long prescription service time also has a negative impact in the form of opportunity loss and opportunity costs both for patients and for the hospital.

The time required to wait for healthcare facilities results in obstacles to obtaining health services. The length of waiting time for health services can result in decreased patient satisfaction, obstacles in obtaining services, low clinical achievement of patients and increased costs of waiting and anxiety (McIntyre & Chow, 2020). Pharmaceutical installations are an integral part of the service in the hospital. Pharmacy services are the last service visited by outpatients hence the patient satisfaction factor needs to be a special concern to determine overall hospital services (Alodan et al., 2020).

In this study, an activity analysis was carried out with an activity-based management approach to 69 activities. The results of the study found that waiting activity was the cause of the activity of long prescription services. Waiting activities can be caused by a lack of human resources or the number of activities that must be done. The activity of confirming recipes that do not match the formulary causes the next recipe to have to wait for the confirmation to be completed. Waiting activities have the potential to be non-value-added activities and need to be reduced for example by the addition of pharmacy personnel. Activity-based management uses cost-driving analysis, activity analysis and performance measurement to improve operations (Kaplan & Anderson, 2007). Activity-based management improves key company factors and increases competitive advantage by identifying the resources used by consumers, products, and activities (Blocher et al., 2013).

The determination of value-added and non-value-added activities is seen from whether the activity has value and participation and has an influence on the smooth process of prescription services. Activities are said to have added value if they are activities that cause changes in circumstances. A change in circumstances cannot be achieved with previous activities, and such activities allow other activities to be carried out (Hansen & Mowen, 2012).

Based on the findings, it was found that the opportunity loss of patients in terms of time for finished drugs was 75.01min, chronic drugs 71.14 minutes and non-chronic drugs 46.3 minutes. Patient opportunity losses include reduced performance and meal allowances for public servants, and loss of meal stipend and bonuses for private workers. The opportunity for loss is also in the form of reduced daily income for the self-employed, and for housewives, there are replacement costs while in the hospital. Replacement costs are incurred mainly by housewives for example to buy food because there is no time to cook. The opportunity of loss cannot be eliminated because the patient leaves his job and chooses to go to the hospital.

Opportunity cost is an evaluation given to the alternative or preferred opportunity that is rated the highest (Spiller, 2011, 2019). Opportunity cost is a potential profit or loss when a person chooses to carry out an activity beyond the next best alternative activity (Chatterjee et al., 2009). Opportunity costs could occur if the technology is less efficient and takes a long time to operate. The Pareto principle can be used in its implementation, namely with the 80/20 rule where doing 20% of the work can generate 80% of the benefits. The 80/20 rule can be applied to almost anything, such as 80% of customer complaints arise 20% of the product or service, 80% of the schedule delay arises 20% of the possible cause of the delay of 20% of the product (Nasution, 2015).

The recommendation given by the researcher is to develop an incentive policy related to reducing costs due to non-value-added activities. The existence of this policy is a guide for management and installation heads in making plans related to providing bonuses if the opportunity is cost turn. Another recommendation to optimise the implementation of incentives is to develop a performance appraisal and remuneration system so that bonuses can be given based on pay for performance. Periodic evaluation programs for the feasibility of providing incentives also need to be prepared so that they are right on target and in accordance with planning (Maher et al., 2005; Untold, 2020).

CONCLUSIONS

The average opportunity cost is based on the kind of occupation of the patients, which can vary. Thus, it is suggested to consider the aspect of occupation when formulating the cost control recommendation to decline opportunity cost. Cost control recommendations to reduce opportunity costs by developing a cost-conscious cultural strategy, developing cost monitoring tools, preparing cost management planning and policies, and developing incentive systems if opportunity costs fall.

DECLARATION

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