

Cost Analysis of Telepharmacy Programs for Diabetes Mellitus Patients at Pharmacy

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ABSTRACT

Diabetes mellitus is silent killer with an increasing prevalence every year. This study aims to analyze the cost of telepharmacy services among patients with diabetes mellitus at the pharmacy using the ABC method of observational research calculated based on the activities carried out and BEP to determine the advantages and disadvantages of the pharmacy. The calculation results using the activity-based costing (ABC) method, the average cost for telepharmacy service costs was Rp. 12,612.- and the average cost incurred to run a telepharmacy services program were Rp. 124,574.- After being analyzed the pharmacy that have provided telepharmacy services, most of them still experience losses, this is because pharmacy have not been able to cover all operational costs.

Keywords: Activity Based Costing (ABC), diabetes, telepharmacy

Background

Diabetes mellitus is a long-term condition that has an impact on severe morbidity and death.(Bunga, 2017) The prevalence in 2021 is estimated at 10.5% and will continue to increase to 12.2% in 2045.(Cousin *et al.*, 2022) Indonesia is ranked 7th out of 10 countries with the most sufferers of 10.7 million and Indonesia is the only Southeast Asian country that has a major contribution to the prevalence of diabetes mellitus.(Dayan *et al.*, 2021)

Treatment of diabetes mellitus has a variety of therapies with the aim of controlling blood sugar levels, including HbA1c.(Eberle and Stichling, 2021) The success of diabetes therapy is influenced by many things, one of which is adherence.(Eze, Mateus and Cravo Oliveira Hashiguchi, 2020) Non-adherence can thwart therapy which indirectly worsens the patient's condition slowly which causes no effect of therapy and can increase the risk of complications.(Insani *et al.*, 2013; Iftinan, Wathoni and Lestari, 2021)

One alternative to increase adherence in patients with diabetes mellitus is the telepharmacy program in the therapy of diabetes mellitus.(Kementrian kesehatan republik indonesia, 2020) The success of the telepharmacy program can increase blood sugar levels in diabetics with therapeutic success reaching 17.01% on glucose 2 hours postprandial.(Li *et al.*, 2022) The telepharmacy program is part of telemedicine which refers to the provision of pharmaceutical services by pharmacists to address pharmaceutical service needs.(Martyn, 2006; McManus *et al.*, 2021)

The presence of telepharmacy that has a positive impact requires careful initial preparation,

especially when preparing for program procurement in pharmacies because the telepharmacy program is regulated in the Regulation of the Minister of Health of the Republic of Indonesia no. 14 of 2021, where this service can be carried out at pharmacies in the form of online retail or marketplaces with special pharmaceutical features.(Permenhub, 2013; Raafi, Saryono and Sari, 2021) So it is necessary to identify the cost components needed to provide telepharmacy program services with a cost analysis of the program services.

Method

This observational study on community pharmacy managers was conducted using electronic and or direct surveys to the pharmacy managers. This study was performed in both Cilacap Districts (As Salam pharmacies, Barokah Farma, 3S'mart, Arianti Farma Adipala, Adjie Farma Kroya, and Lestari Farma Buntu) and Banyumas District (Kita Farma Kemranjen, and Kimia Farma 133 Purwokerto), Central Java. The survey was completed electronically to collect all the relevant data regarding the telepharmacy services from the pharmacies. The survey was performed from November through December 2021. Eight pharmacy managers, both responsible pharmacist and telepharmacy provider, willing to participate in this study and informed consent was collected from them. The diabetic patients who did not receive telepharmacy services and pharmacists who quit during the trial were excluded.

Primary data including patient name, address, number of patients, number of services, cost of reading prescriptions, credit/internet, advertisements, electronic device sales, and patient

medicines were collected. Consulting services and assumption data like retail prices and distance-based transportation charges are also calculated due to the actual value of the costs. The data is calculated using the ABC (Activiy Based Costing) method with the total cost of the activity per total number of services provided, and by calculating the BEP (Break Event Point) to see the advantages and disadvantages of the pharmacy.(Saeedi *et al.*, 2019)

Results and Discussion

Telepharmacy service rates costs incurred by pharmacy to support telepharmacy services are

listed in table (1). Based on the table, the average expenditure for telepharmacy services outside of drugs is Rp. 124,574,- . The highest expenditure at the Barokah Farma Pharmacy is Rp. 433,500 and the lowest Apotek As Salam is Rp. 13,957,- , while for telepharmacy services with the highest drug expenditure at Barokah Farma pharmacies of Rp. 926,300,- and the lowest is also at the As Salam pharmacy for Rp. 15,746,- . This incurs different costs due to the different needs of each pharmacy because of the more complete the pharmacy operations, hence the higher the costs. (Saibi, Romadhon and Nasir, 2020)

Table 1. Pharmacy Operational Costs

Pharmacy Name	As Salam	Barokah Farma	3 S'mart	Arianti Farma	Adji Farma	Lestari Farma	Kita Farma	Kimia Farma 133	Average
Number of Patients*	1	8	6	8	20	4	17	5	9
Number of Services*	1	80	6	8	20	4	17	5	18
Recipe Reading*	Capital 250	0	0	0	0	250	0	0	125
	Selling price 500	0	0	0	0	500	0	0	333
Consulting Services**	Capital 1,000	75,000	30,000	2,000	20,000	2,000	17,000	5,000	19,000
	Selling price 2,000	150,000	60,000	4,000	0	4,000	0	0	44,000
Electricity***	Capital 1,623	6,090	1,623	1,623	1,623	1,623	1,623	1,623	2,181
	Selling price 0	0	0	0	0	0	0	0	0
Credit / Internet*	Capital 5,000	100,000	50,000	30,000	30,000	20,000	30,000	50,000	39,375
	Selling 0	0	0	0	0	0	0	0	0
Administration***	Capital 700	56,000	4,200	5,600	2,000	2,800	17,000	3,500	12,828.57
	Selling price 0	0	0	0	0	0	0	0	0
Transportation***	Capital 384	100,000	0	0	19,200	0	10,848	0	32,608
	Selling price 0	150,000	0	0	100,000	0	85,000	0	111,667
Advertisement*	Capital 0	1,410	0	0	2,800	0	0	0	2,105
	Selling price 0	0	0	0	0	0	0	0	0
Electronic devices*	Capital 5,000	95,000	67,000	34,000	13,500	40,000	13,500	19,200	35,900
	Selling price 0	0	0	0	0	0	0	0	0
Drug*	Capital 1,789	492,800	16,390	49,274	38,500	133,497	51,199	14,465	99,739
	Selling price 2,000	510,000	28,000	65,500	60,000	155,000	125,500	19,700	120,713
Total with Medicine	Capital 15,746	926,300	169,213	122,497	125,623	200,170	141,170	93,788	224,313
	Selling price 4,500	810,000	88,000	69,500	160,000	159,500	210,500	19,700	190,213
SD	Capital 1,608	162,687	18,450	18,466	15,085	46,336	17,656	17,128	-
	Selling price 866	170,367	20,986	21,707	36,666	51,495	47,502	6,566	-
Total No Drugs	Capital 13,957	433,500	152,823	73,223	87,123	66,673	89,971	79,323	124,574
	Selling price 2,500	300,000	60,000	4,000	100,000	4,500	85,000	0	69,500
SD	Capital 2,069	45,252	26,699	14,261	11,379	14,436	10,479	17,411	-
	Selling price 748	73,192	22,677	1,511	37,796	1,492	32,126	0	-

Note: *Primary data; **Combination of primary data and assumptions; ***Assumption data

The cost of telepharmacy services to determine the cost of each patient using the activity based costing (ABC) method and the results of this calculation obtained data on the cost of telepharmacy services that must be paid for each patient in the table 2. The highest drug-free service

rate at Apotek 3 S'mart is Rp. 30,470,- and the lowest rate was at the Kita Farma pharmacy without drugs for Rp. 5,326,- Service with medicine for Rp. 60,117,- at Lestari Farma pharmacy and services with drugs for Rp. 7,251,- at Kita Farma.

Table 2. Telepharmacy service cost for each patient

Pharmacy Name	As Salam	Barokah Farma	3 S'mart	Arianti Farma	Adji Farma	Lestari Farma	Kita Farma	Kimia Farma 133	Rata-rata
Number of Patients*	1	8	6	8	20	4	17	5	9
Number of Services*	1	80	6	8	20	4	17	5	18
Recipe Reading*	Capital 250	0	0	0	0	250	0	0	250
	Selling price 500	0	0	0	0	500	0	0	500
Consulting Services**	Capital 1,000	1,000	10,000	250	1,000	500	1,000	1,000	1,969
	Selling price 2,000	1,000	10,000	500	0	1,000	0	0	1,813
Electricity***	Capital 54	76	271	203	81	406	95	325	189
	Selling price 0	0	0	0	0	0	0	0	0
Credit / Internet*	Capital 5,000	1,250	8,333	3,750	1,500	5,000	1,765	10,000	4,575
	Jual 0	0	0	0	0	0	0	0	0
Administration***	Capital 700	700	700	700	1,000	700	1,000	700	775
	Selling price 0	0	0	0	500	0	500	0	500
Transportation***	Capital 384	1,250	0	0	960	0	672	0	817
	Selling price 0	1,000	0	0	5,000	0	5,000	0	3,667
Advertisement*	Capital 0	18	0	0	140	0	0	0	79
	Selling price 0	0	0	0	0	0	0	0	0
Electronic devices*	Capital 5,000	1,187	11,166	4,250	675	10,000	794	3,840	4,614
	Selling price 0	0	0	0	0	0	0	0	0
Drug*	Capital 1,789	6,765	1,925	1,925	1,925	43,261	1,925	1,925	7,680
	Selling price 2,000	9,000	3,500	2,500	3,000	50,000	3,500	2,500	9,500
Total with Medicine	Capital 14,177	12,246	32,395	11,078	7,281	60,117	7,251	17,790	20,292
	Selling price 4,500	11,000	13,500	3,000	8,500	51,500	9,000	2,500	12,938
SD	Capital 2,017	2,095	4,766	1,687	658	14,124	713	3,257	
	Selling price 866	2,948	3,391	829	1,810	16,607	1,887	833	
Total No Drugs	Capital 12,388	5,481	30,470	9,153	5,356	16,856	5,326	15,865	12,612
	Selling price 2,500	2,000	10,000	500	5,500	1,500	5,500	0	3,438
SD	Capital 2,155	570	5,051	1,782	543	3,594	616	3,482	
	Selling price 703	462	3,535	176	1,751	372	1,751	0	

Note: *Primary data; **Combination of primary data and assumptions; ***Assumption data

The cost of consulting services showed on table 3 with the highest was Rp. 10,000,- at the Apotek 3 S'mart and the lowest was Rp. 250,-at the Arianti Farma pharmacy. For determining the cost of pharmacist consulting services based on the characteristics of the patient.(Sen, 2021)

Table 3. Cost for consulting services

Pharmacy name	Consulting services (IDR)
As Salam	1,000
Barokah Farma	1,000
3 S'mart	10,000
Arianti Farma	250
Adji Farma	1,000
Lestari Farma	500
Kita Farma	1,000
Kimia Farma 133	1,000

Pharmacies were said to be profitable if the income is greater than the capital issued and vice versa. Table 1 pharmacy that benefits Adji Farma

pharmacies of Rp. 34,377, - and Apotek Kita Farma for Rp. 68,830,-. The biggest profit is obtained from drug profits and drug delivery costs. Meanwhile, other pharmacies do not carry out drug delivery activities so that profits can only be obtained from reading prescriptions, services and drugs. Therefore, to increase revenue, it would be better if in this service drug delivery activities were carried out. In addition to increasing income, it will also make it easier for patients.(Sun et al., 2019, 2022)

Table 4. Break Even Point

Pharmacy name	Break Point With Drugs	Even (BEP)	Break Even Point (BEP) Without Drugs
As Salam	31		70
Barokah Farma	163		-213
3 S'mart	136		-169
Arianti Farma	525		-145
Adji Farma	13		16
Lestari Farma	10		1.232

Kita Farma	10	14
Kimia Farma 133	-374	-19
Average	127	115

A BEP (Break Event Point) calculation is carried out for pharmacies that do not experience losses, this is done so that at least the pharmacy must get income according to expenses and to determine the target number of patients so that the amount of income is at least proportional to the amount of expenditure. BEP without drugs has the highest value in Lestari Farma pharmacy at IDR. 1.232,- this is because the cost of the pharmacy was very small so it takes a lot of services to cover all operational costs.

Pharmacies that show negative results are due to the negative service contribution margin so that these services do not help drive an increase in total revenue because they do not set special rates for telepharmacy services. Profits are only obtained from the sale of drugs, so that pharmaceutical services cannot cover the operational costs of telepharmacy services, therefore pharmacies are still experiencing losses. (Syafrawati, 2017; Tahhan et al., 2020)

The effectiveness of telepharmacy services in patients receiving telepharmacy services has a change in HbA1c with an average of -1.14%, while in the group receiving services at diabetes clinics it is 0.88% and in patients receiving services in primary care = 0, 21% (p=0.061). As many as 43.75% of patients with telepharmacy intervention experienced a decrease in HbA1c, in the diabetes clinic group as many as 35.71% patients experienced a decrease and in primary care it decreased by 26.09% (p=0.51). Based on these studies, it can be concluded that telepharmacy services can reduce HbA1c levels in diabetic patients. (Wifaaq U. Putri, 2018; Zhang, 2021)

Conclusion

The average cost of telepharmacy services at pharmacies is Rp. 12,612,- . Most of the pharmacies that run telepharmacy programs have not benefited from telepharmacy services for diabetic patients. Because it has not been able to cover the capital issued. To cover the capital costs, these pharmacies must provide an average of 115 services in 1 month.

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