ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 11, Issue 8, 2018

Online - 2455-3891
Print - 0974-2441

Research Article

ANALYSIS OF DRUG COST TOWARD CAPITATION COST FOR TOP DISEASES IN SPECIAL REGION OF YOGYAKARTA PUBLIC HEALTH CENTERS

SATIBI SATIBI[1]*, DIAHAYUPUSPANDARI[2], RISMA SAKTI P[3], TRISNADEWI N[3], WILONAKAULIKA[3],

[1]Department of Pharmaceutics, Pharmacy Faculty, Universitas Gadjah Mada, Indonesia. [2]Department of Health Policy Management, Faculty of Medical, Universitas Gadjah Mada, Indonesia. [3]Department of Pharmaceutics, Magister Management of Pharmacy, Pharmacy Faculty, Universitas Gadjah Mada, Indonesia. Email: Satibi@ugm.ac.id

Received: 03 March 2018, Revised and Accepted: 25 April 2018

ABSTRACT

Objective: In this study wanted to analyze the differences between actual and standard of prescription cost. Researchers also conducted an analysis to see whether there was a difference between actual and standard of drug value in the amount of capitation fund.

Methods: This study was a retrospective observational analytic. Medical prescriptions (January 2015–June 2015) will be obtained at several Puskesmas in D.I Yogyakarta. Mann–Whitney test was performed to conduct whether there was a difference between actual and standard of prescription cost. Independent sample t-test was performed to conduct whether there was a difference between actual and standard of drug value in the amount of capitation fund.

Results: Based on the data, it showed that there was a significant difference ($p<0.05$) between actual and standard of prescription cost. There was also a significant difference between actual and standard of drug value in the amount of capitation fund at Puskesmas in Yogyakarta city and Bantul district. The difference of value caused by prescription cost value factor that there is duration component in calculation. Yet in Sleman district, there was no significant difference ($p>0.05$).

Conclusion: There was a significant difference between actual and standard of prescription cost. There was also a significant difference between actual and standard of drug value in the amount of capitation fund at Puskesmas in Yogyakarta city and Bantul district. Yet in Sleman district, there was no significant difference.

Keyword: Capitation system, BPJS, Cost analysis, Top five diseases, Puskesmas.

 DOI: http://dx.doi.org/10.22159/ajpcr.2018.v11i8.25608

INTRODUCTION

The satisfaction and patient safety are very important in the health service in the era of JKN. Several factors that influence satisfaction is patient characteristics include education, employment, income and membership status, and service in systems JKN include services JKN and pharmacy services in the era of JKN have a significant relationship with patient satisfaction in primary health-care facilities [1]. To increase the quality of health service facility on the level one so that the development of payment system through capitation system is enacted. Health BPJS conducts the payment to Puskesmas by way of capitation on the total members registered in the First-level Health Service Facility [2]. Capitation fund received used to pay health service (60%) and operational cost of health service (40%). Operational cost including pharmacy supply management (drugs, reagan, and medical disposal material) and the other health operational [3]. Drug costs in era JKN depending on the pattern of cooperation with health facilities pharmacies and BPJS [4].

Several actual issues that appeared related with feasibility and economic value the amount of price of capitation, issue of using capitation fund by Puskesmas, and issue quality of health service that is given by Puskesmas. In the pharmaceutical field, the capitation rate for the component used to calculate the nominal amount multiplied by the total number of JKN participants enrolled in the puskesmas may be sufficient for the procurement of all medicines used for health services at the puskesmas [5]. Several researches showed that total direct cost components were incurred higher than the other components [6]. A number of drug sufficiency cost can be showed with indicator of the management of region drugs, among others the conformity of fun of drugs management, cost and fund of drugs per capita, and cost and drug fund each visit. Number of sufficiency of drug (*AKO*) gotten from herast of stock/total supply (inventory) divided by the average of using per month which can reflect the average of sufficient of drug cost.

Percentage calculation of drug component in the capitation number paid by Health *BPJS* should consider the total participants of JKN registered in Puskesmas. Utilization rate, prescription cost for each group of disease served by Puskesmas, and value of capitation tariff in number paid by Health *BPJS* to *Puskesmas* [5] from the above explanation, a research concerning analysis of capitation cost in the JKN era toward the top disease in Puskesmas in DI Yogyakarta.

Poverty rate in DI Yogyakarta is high enough so that it is necessary to pay attention toward financing of public health. *BPJS* program is one of the efforts to implement public health effort. From the above explanation, research concerning analysis of medicine cost toward the top five diseases in DI Yogyakarta *Puskesmas*. The research objective is to understand the percentage difference between actual and standard rate of drugs using capitation number.

METHODS

Research design

It includes analytical non-experimental study retrospectively. Source data used are secondary data derived from financial data *Puskesmas* capitation and recipe sheets.

Research subjects

The total number of samples used is 783 sheets of recipes scattered in three health centers and five biggest diseases for each district. The researchers calculated the proportion of the sample using the

method. The subjects of the study are the whole adult patients who are participants JKN at Kalasan Puskesmas, Puskesmas Ngemplak 2, PHC Mlati 1, PHC Banguntapan 2 Pleret Puskesmas, Puskesmas Sewon 1 Mergangsan health centers, health centers, and health centers Tegalrejo Jetisyang disease diagnosed in the five biggest.

Collecting data

Collecting data are done by observing the source of data; they are prescription data, medical record datum management information system, and finance management and capitation income.

Data analysis

Data processing by calculating the value of prescription cost actual and standard and number of actual and standard drug component. The results were analyzed by Mann-Whitney and Independent SampleT-Test. Mann–Whitney test is used to see if there is a difference between standard and actual prescription cost, whereas to see the difference between percentage actual and standard medicine component using independent sample t-test normal distributed data.

RESULTS AND DISCUSSION

The result is done by seeking information of top 10 of diseases in January 2015–June 2015 in each Puskesmas in each regency by searching through integrated SIMPUS ON p-care system, then result gotten in each Puskesmas is averaged and determined the top five of diseases in each reagent. Data of the top diseases in each regency can be seen in Table 1.

Table 1: Data of the top five of diseases in each regency

Diagnosis	Total
Yogyakarta city	
Primary hypertension	12.440
Non-specific upper respiratory tract infection	6.264
Mellitus diabetes	5.122
Myalgia	3.307
Dyspepsia	1.973
Sleman regency	
Primary hypertension	4.900
Pulpadesease and periapical tissue	3.716
Non-specific upper respiratory tract infection	4.318
Dyspepsia	3.167
Common cold/Acute nasopharyngitis	2.477
Bantul regency	
Common cold	6.834
Hypertension	4.731
Myalgia	3.396
Mellitus diabetes	3.173
Fever	1.881

Prescription cost value

Prescription cost value divided into two, actual and standard. *Actual and standard prescription cost* gotten by multiplying price per item in the prescription with total of the drugs, whereas for the standard by multiplying unit cost of prime drug each disease with standard dose and duration of standard drug. To calculate the value of prescription cost, it is necessary to consider Puskesmas therapy standard. Therapy standard used by Puskesmas refers to Puskesmas therapy in DI Yogyakarta along with decree of the Ministry of Health No. 5 year 2014 [7]. Standard made on the basis of those decree, then processed to be used as the components to compile prescription cost standard value.

Prescription cost standard value is gotten by multiplying the price of the top five drug items with standard dose. Standard dose is gotten by dividing between defined daily doses (DDD) with the strength of stock of drugs according to the WHO, DDD is the dose of average daily maintenance assumed for using of drug with prime indication for adult patient. Value of actual prescription cost is gotten by multiplying the price of drugs and total number of drug [8]. The mean prescription cost can be seen in Table 2.

Table 2: Mean of actual and standard prescription cost value of five top diseases in Puskesmas

Type of diseases	n	Prescription cost value	
		Actual	Standard
Yogyakarta city			
Primary hypertension	335	Rp 1.865	Rp 3.460
Not specific - upper respiratory tract infection	169	Rp 2.989	Rp 6.060
Mellitus diabetes	138	Rp 3772	Rp 8.788
Myalgia	89	Rp 4.039	Rp 6.101
Dyspepsia	53	Rp 1.564	Rp 4.439
Sleman regency			
Primary hypertension	207	Rp 1.810	Rp 2.893
Pulpa disease dan periapical tissue	157	Rp 3.001	Rp 4.517
Not specific - upper respiratory tract infection	182	Rp 3.093	Rp 5.433
Dyspepsia	133	Rp 1.469	Rp 2.551
Common cold/Acute nasopharyngitis	104	Rp 1.963	Rp 4.499
Bantul regency			
Common cold	296	Rp2.237	Rp 5.735
Hypertension	162	Rp2.375	Rp 3.435
Myalgia	129	Rp 2.336	Rp 3.883
Mellitus diabetes	125	Rp 4.556	Rp 9.123
Fever	71	Rp 2.233	Rp 2.615

The result of actual and standard of each prescription then analyzed statistically by Mann–Whitney test. Mann–Whitney test is used to see the difference between standard of the top five diseases in Puskesmas. The result of statistical analysis shows that there is a difference between the values of actual and standard of prescription cost. It shows with $p<0.05$ (Table 3).

The result of research shows that value is $p<0.05$. In this case is the same with research done by Sudarsono in Puskesmas Pangkalpinang regency that shows that there is a difference of actual prescription cost value and standard ($p<0.05$) [5]. This difference is because of duration, total items of drugs, and dose of it. In this research, duration used between standard and actual written in the prescription. The difference of total amount of actual and standard prescription happened because there is a difference of components of the formation of cost during the process of calculation, among other duration, total item of drugs and dose of drugs. It is difference with the research conducted by Foster and Frost toward family doctors; we can take a decision that there is a variation of 60% on prescription cost value interpatients because of distribution of the difference of age and gender in the population, mortality ratio and also human resources in the population [9]. This is almost the same with Baker dan Klein who conducted a research of the family health-care area that 69% variation of prescription cost value identified because of mortality ratio, inhabitant proportion where there are more inhabitants at the age of 65 and also total number of health human resources in the population [10].

Percentage value of drug component number

Value of component number in the amount of capitation tariff constitutes estimation value of drug component need for diseases therapy from total budget from capitation fund available in Puskesmas. Calculation of component numbers of drug from the result of study of prescription data will reflect more of the need of fund of drugs compared with search of using the previous fund of drug that is not always efficient [11]. Calculation of percentage value of component number of drugs used the mean of prescription cost (Table 2). Other

components that are necessary to get more attention are capitation cost and morbidity number. Cost of capitation received by each Puskesmas gotten from multiplication of capitation tariff determined by *BPJS* with the total number of members in the Puskesmas. Data of Puskesmas capitation cost can be seen in Table 4.

Table 3: Result of statistical analysis test Uji Mann–Whitney

Yogyakarta city		
Diagnosis	**Result of Mann–Whitney prescription cost**	
	Mean±SD	**p**
Primary hypertension	Rp 2.662±Rp. 1.789	0.000*
Not specific of upper respiratory	Rp 4.524±Rp. 3.518	0.000*
Mellitus diabetes	Rp 6.280±Rp. 3.777	0.000*
Myalgia	Rp 3.734±Rp. 3.368	0.000*
Dyspepsia	Rp 2.998±Rp. 2.437	0.000*
Sleman regency		
Primary hypertension	Rp 2.353±Rp 1.089	0.000*
Pulpa disease dan periapical tissue	Rp 3.852±Rp 2.990	0.000*
Not specific of upper respiratory tract infection	Rp 4.433±Rp 2.809	0.000*
Dyspepsia	Rp 2.062±Rp 1.556	0.000*
Common cold/ Nasopharyngitis acute	Rp 3.210±Rp 1.664	0.000*
Bantul regency		
Common cold	Rp 4.025±Rp 2.749	0.000*
Hypertension	Rp 2.784±Rp 1.283	0.000*
Myalgia	Rp 3.128±Rp 1.686	0.000*
Mellitus diabetes	Rp 7.040±Rp 3.578	0.000*
Fever	Rp 2.422±Rp 1.429	0.000*

*Statistically significant (p<0.005). SD: Standard deviation

Table 4: Capitation cost in Puskesmas

Yogyakarta city			
Capitation cost	**Jetis**	**Mergangsan**	**Tegalrejo**
January	Rp 84.494.000	Rp 88.902.000	Rp 114.978.000
February	Rp 89.710.000	Rp 89.988.000	Rp 117.294.000
March	Rp 91.688.000	Rp 93.366.000	Rp 119.796.000
April	Rp 95.780.000	Rp 91.686.000	Rp 125.794.000
May	Rp 93.722.000	Rp 92.874.000	Rp 121.316.000
June	Rp 94.916.000	Rp 93.690.000	Rp 122.408.000
Mean	Rp91.718.333	Rp91.751.000	Rp120.264.333
Sleman regency			
Capitation cost	**Ngemplak 1**	**Kalasan**	**Mlati 2**
January	Rp 43.814.000	Rp 135.402.000	Rp 95.054.000
February	Rp 47.270.000	Rp 137.808.000	Rp 98.782.000
March	Rp 64.071.000	Rp 170.520.000	Rp 151.606.000
April	Rp 60.195.000	Rp 168.872.000	Rp105.400.000
May	Rp 50.186.000	Rp 166.526.000	Rp 100.730.000
June	Rp 50.960.000	Rp 167.426.000	Rp 145.308.000
Bantul regency			
Capitation cost	**Banguntapan 2**	**Pleret**	**Sewon 1**
January	Rp 95.682.000	Rp 162.612.000	Rp 153.252.000
February	Rp 96.636.000	Rp 163.674.000	Rp 155.400.000
March	Rp 98.220.000	Rp 164.856.000	Rp 159.036.000
April	Rp 100.980.000	Rp 166.956.000	Rp 166.248.000
May	Rp 99.316.000	Rp 165.546.000	Rp 162.366.000
June	Rp 99. 864.000	Rp 165.882.000	Rp 162.798.000

Percentage calculation of drugs component number in general showed by the formula as follows:

$$AKO = \frac{\left\{\begin{array}{l}(\text{Number of Morbidity} \times \text{ Prescription Cost}) \\ \times \text{Total Members of JKN}\end{array}\right\}}{(\text{Capitation Tarif} \times \text{Total Members of JKN})} \times 100\%$$

Result of actual and standard calculation of AKO in percentage and rupiah showed in Table 5.

From calculation, we get value of percentage actual and standard of drug component in each Puskesmas that the difference seems high enough. It is the same with previous research done by Sudarsono that there is a difference between percentage value and number of actual and standard component in Puskesmas in Pangkalpinang city [5]. The difference of value caused by prescription cost value factor that there is duration component in calculation. To understand the difference, it is significantly different. Hence, it is necessary to test using statistical method analyze independent sample t-test. The result of that statistic can be seen in Table 6.

From research data of actual and standard component number indicate that there is difference between percentage of actual and standard component number with P value <0.05. In the previous research shows that there is a difference of percentage of actual and standard value of component number with value of <0.038 in Puskesmas in Pangkalpinang city [5]. Whereas in Sleman regency, there is no significant difference between percentage value of actual and standard component number, it is p>0.05. Hence, the actual of using capitation is not a lot different with standard, but it is necessary to evaluate so that it will be appropriate with the standard so that the drug management of Puskesmas in Sleman regency will be efficient. Using of drug pattern in Puskesmas, all over Palangka Raya city on the therapy of five top disease depends on the stock of drug in Puskesmas [12]. Changes in the availability of drugs in pharmaceutical warehouses and in puskesmas affect the pattern of drug use in the treatment of the five diseases. It is very appropriate with the reality of research finding that level of availability cost of drug depends on the level of the adequacy of drug fund allocated. In Puskesmas' in Kapuas Hulu, prescription depends on the stock of drug in Puskesmas so that the result is rational treatment a little bit ignored. In the research done in Uganda, stated that there are some variables that must be considered in allocating the need of pharmacy cost, among others are total number of visits by patients, population of inhabitants, total number of health facilities in the regency, and also poverty rate per regency [11].

This research constitutes assumption of estimated calculation of the amount of budget for drug components in total amount of capitation received. This assumption uses scenario of percentage calculation cost of drug component of capitation. This can be an input if in Puskesmas the source of drugs delivery is from capitation, so Puskesmas can fulfill the need of drugs so that the other fund received can be spent maximally for the other operational activities such as promotion, prevention, and rehabilitation. Prescription that has small value can transfer other cost for preventive and promotive program [13]. Pharmacist is hoped can be cooperative a lot with doctor in clinic serving and helping to choose the efficient drug cost, one of the way is by proposing the doctor to reduce the duration of treatment if it takes a lot of time and makes it longer if it is too fast [14]. Long duration can cause side effect or inefficient fund. Good drug delivery including assurance variable and the most influence toward customer's satisfaction variable is the direct evidence and guarantee with test value t significance variable direct evidence of 0.01<0.05 and guarantee variable of 0.00<0.05 [15].

CONCLUSION

From the research, it can be concluded that there was a significant difference between actual and standard of prescription cost. There was also a significant difference between actual and standard of drug value

Table 5: The amount of drugs component number in Puskesmas

Yogyakarta city					
Puskesmas	**Mean of capitation cost**	**Name of diseases**	**Drug component number**		
			Actual	**Standard**	
			Rp (%)	**Rp**	**%**
Jetis	Rp 91.718.333	HT	Rp 419.401 (0.46)	Rp 1.103.222	1.20
		ISPA-ts	Rp 332.134 (0.36)	Rp 786.063	0.86
		DM	Rp 290.587 (0.32)	Rp 1.062.730	1.18
		ML	Rp 187.137 (0.20)	Rp 441.303	0.48
		DP	Rp 68.589 (0.07)	Rp 179.530	0.20
		Total	Rp1.297.848 (1.42)	Rp3.572.850	3.90
Mergangsan	Rp 91.751.000	HT	Rp 708.863 (0.77)	Rp 1.067.745	1.16
		ISPA-ts	Rp 693.507 (0.76)	Rp 1.628.903	1.78
		DM	Rp 629.782 (0.69)	Rp 1.539.278	1.68
		ML	Rp 61.849 (0.07)	Rp 242.790	0.26
		DP	Rp 70.686 (0.08)	Rp 189.934	0.21
		Total	Rp 2.164.690 (2.36)	Rp4.668.652	5.09
Tegalrejo	Rp 120.264.333	HT	Rp 885.488 (0.74)	Rp 1.776.365	1.48
		ISPA-ts	Rp 615.794 (0.51)	Rp 917.154	0.76
		DM	Rp 766.408 (0.64)	Rp 1.198.187	1.00
		ML	Rp 335.468 (0.28)	Rp 813.747	0.69
		DP	Rp 132.313 (0.13)	Rp 271.157	0.23
		Total	Rp 2.735.472 (2.27)	Rp4.976.615	4.14
Sleman regency					
Ngemplak 1	Rp 52.749.333,-	HT	Rp170.662 (0.32)	Rp233.003	0.44
		PP	Rp 149.610 (0.28)	Rp228.971	0.43
		ISPA	Rp 30.247 (0.06)	Rp46.707	0.09
		DP	Rp 94.957 (0.18)	Rp192.169	0.36
		CC	Rp 151.410 (0.29)	Rp378.315	0.72
		Total	Rp 598.886 (1.13)	Rp1.079.164	2.05
Kalasan	Rp 157.759.000,-	HT	Rp 165.615 (0.10)	Rp 267.453	0.17
		PP	Rp 104.425 (0.07)	Rp 174.282	0.11
		ISPA	Rp 232.507 (0.15)	Rp 420.420	0.27
		DP	Rp 124.316 (0.08)	Rp 209.720	0.13
		CC	Rp 84.455 (0.05)	Rp 191.043	0.12
		Total	Rp 711.317 (0.45)	Rp 1.262.917	0.80
Mlati 2	Rp 116.146.666,-	HT	Rp 264.782 (0.23)	Rp 477.227	0.41
		PP	Rp 620.113 (0.53)	Rp 878.506	0.76
		ISPA	Rp 745.649 (0.64)	Rp1.431.328	1.23
		DP	Rp79.772 (0.07)	Rp 122.101	0.11
		CC	Rp60.332 (0.05)	Rp 129.224	0.11
		Total	Rp 1.770.648 (1.52)	Rp 3.038.386	2.62
Bantul regency					
Banguntapan2	Rp 98.449.666,67	CC	Rp 311.131 (0.32)	Rp 838.035	0.85
		HT	Rp 71.893 (0.07)	Rp 120.340	0.12
		ML	Rp 146.175 (0.15)	Rp 241.945	0.25
		DM	Rp 90.108 (0.09)	Rp 221.359	0.22
		FV	Rp 21.751 (0.02)	Rp 33.621	0.03
		Total	Rp 641.059 (0.65)	Rp 1.455.302	1.48
Pleret	Rp164.921.000,00	CC	Rp 317.305 (0.19)	Rp 794.198	0.48
		HT	Rp 300.772 (0.18)	Rp 445.057	0.27
		ML	Rp 66.402 (0.04)	Rp 120.760	0.07
		DM	Rp 548.112 (0.33)	Rp 980.429	0.59
		FV	Rp 149.295 (0.09)	Rp 184.325	0.11
		Total	Rp 1.381.888 (0.84)	Rp 2.524.771	1.53
Sewon 1	Rp159.850.000,00	CC	Rp 419.560 (0.26)	Rp 1.043.679	0.65
		HT	Rp 447.777 (0.28)	Rp 577.715	0.36
		ML	Rp 279.846 (0.18)	Rp 432.319	0.27
		DM	Rp 555.417 (0.35)	Rp 1.060.290	0.66
		FV	Rp 240.192 (0,15)	Rp 217.201	0.14
		Total	Rp 1.942.795 (1.22)	Rp 3.331.206	2.08

HT: Primary hypertension, CC: Common cold, FV: Fever, PP: Pulpa disease, DP: Dyspepsia, ISPA-ts: Not specific - upper respiratory tract infection, DM: Type 2 non-insulin-dependent mellitus diabetes, ML: Myalgia

in the amount of capitation fund at Puskesmas in Yogyakarta city and Bantul district. Yet in Sleman district, there was no significant difference.

ACKNOWLEDGMENTS

For the Faculty of Pharmacy Universitas Gadjah Mada which support finance for this research

AUTHOR'S CONTRIBUTION

All authors have made substantial contributions to the work reported in the manuscript. Satibi Satibi: Conception and designing of the study, data analysis and interpretation, drafting the article, critical revision of the article, and final approval of the study to be published. Risma Sakti Pambudi: Concepting of the study, data collection, data analysis

Table 6: Result of statistical analysis of independent sample t-test

AKO value	n	Result of test (p)
Yogyakarta city	6	0.007*
Sleman regency	6	0.272
Bantul regency	6	0.035*

Significance p<0.05

and interpretation, and drafting the article. Trisna Dewi N: Concepting of the study, data collection, data analysis and interpretation, and drafting the article. WilonaKaulika: Data collection, data analysis and interpretation, and drafting the article. Diah Ayu Puspandari: Conception and designing of the study, drafting the article, and critical revision of the article.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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