JFSP Vol.9, No.2, May-August 2023, Page: 126-131 pISSN: 2549-9068, eISSN: 2579-4558
Jurnal Farmasi Sains dan Praktis
(JFSP)
http://journal.unimma.ac.id/index.php/pharmacy

PRESCRIPTION COST ANALYSIS IN PATIENTS OF TYPE 2 DM AND HYPERTENSION JOINING CHRONIC DISEASE MANAGEMENT PROGRAM (PROLANIS) AT PUSKESMAS AFTER THE IMPLEMENTATION OF NATIONAL HEALTH INSURANCE (STUDY AT FIRST LEVEL HEALTH FACILITIES IN SEMARANG CITY)

Arifin Santoso[1], **Indriyati Hadi Sulistyaningrum**[1], **Hesti Dwi Widaryanti**[1], **Kusuma Arbianti**[2], **Chilmia Nurul Fatiha**[1], **Elmiawati Latifah**[3]

[1]Department of Clinical and Community Pharmacy, Pharmaceutical Program, Faculty of Medicine, Universitas Islam Sultan Agung, 50112 Semarang, Indonesia
[2]Faculty of Dentistry, Universitas Islam Sultan Agung, 50112 Semarang, Indonesia
[3]Department of Pharmacy, Faculty of Health Sciences, Universitas Muhammadiyah Magelang, 56172 Magelang, Indonesia

indriyati@unissula.ac.id

https://doi.org/10.31603/pharmacy.v9i2.5234

Article info:
Submitted : 07-07-2021
Revised : 12-09-2022
Accepted : 27-05-2023

Publisher:
Universitas Muhammadiyah Magelang

ABSTRACT
To improve the status of public health and carry out social security programs in the health sector, the government started to implement the National Health Insurance. This program covers the participants' medical care expenses using the capitation system applied in health centers as the First-Level Health Facilities. BPJS Kesehatan has allocated some budget in the form of a capitation rate to first-level health facilities for hypertension and type 2 diabetes mellitus patients after the implementation of National Health Insurance. This research was carried out in 4 health centers, namely Lamper Tengah Health Center, Mangkang Health Center, Mijen Health Center, and Karanganyar Health Center. The data were collected retrospectively from the medical records of 800 patients. The data were analyzed descriptively to determine the prescription cost and Spearman's rho test was used to find the factors that influence the prescription cost. It was revealed that the average prescription cost for type 2 DM patients was IDR 142,293, and for hypertensive patients was IDR 112,735. The prescribing pattern in patients covered by Prolanis program for type 2 DM patients is a combination of glimepiride, metformin with a drug price of IDR 20,670. Factors that have an influence on prescription costs are diagnosis p= 0.033, type of drug (p= 0.000) and drug item (p= 0.000). This study concludes that the factors to influence the drug costs of Prolanis patients at the health centers of Semarang City were the patient's diagnosis, the type of drug given, and the number of drug items given.

Keywords: Prolanis; Prescription cost; Type 2 diabetes mellitus; Hypertension

1. INTRODUCTION

To improve the status of public health and carry out social security programs in the health sector, the government started to implement the National Health Insurance (JKN) (Ernawati and Uswatul, 2019). This program covers medical care expenses of patients at some health services in Indonesia using capitation funds obtained from JKN participants. Puskesmas (Health Centers) as the first-level health facilities is one of the health facilities whose expenses is covered by the capitation system. BPJS Kesehatan (Healthcare and Social Security Agency) has allocated budget in the form of a capitation rate to the first-level health facilities (Depkes RI, 2014).

The government and BPJS Kesehatan collaborate with health facilities through an integrated program of chronic disease management for patients of chronic diseases, which is commonly

referred to as "Prolanis" or "Chronic Disease Management Program" (Rosdiana, Raharjo and Indarjo, 2017). Prolanis aims to encourage participants with chronic diseases to achieve an optimum quality of life. This program is deemed successful as seen from the fact that 75% of registered participants who come to seek for treatment at the First Level Health Facilities came up with “good” examination results, particularly for those suffering from Type 2 Diabetes Mellitus and Hypertension according to Related Clinical Guidelines, which can prevent from the emergence of other complications (Arifa, 2018).

Previous studies had reviewed the financial aspect in supporting healthcare facilities, such as pharmacies, but no studies have been conducted on the correlation between financial aspect and chronic diseases and there are no definite factors to influence the increasing expenses in prescription cost, especially for patients under Prolanis scheme (Ayu *et al.*, 2015). Drug procurement is provided by the PRB Pharmacy (Referral Program), where the pharmacy network under the BPJS Kesehatan provides the availability of Drug Rehabilitation Requirements, one of which is made available through Prolanis. The submission of claims from PRB pharmacies to BPJS Health must comply with the guidelines because the reference for e-catalogue is added to the financing of pharmaceutical services (Aodina, 2019). According to WHO (2016), there had been a constantly soaring number of Diabetes Mellitus patients in the world from 382 million people in 2013 to 592 million in 2035. Various epidemiological studies show that the prevalence of hypertension in patients with Diabetes Mellitus is 1.5-2 times greater than the non-Diabetes Mellitus population. Meanwhile, in Central Java, the prevalence of diabetes exceeds the national rate of 1.6%. Researchers chose chronic diseases (hypertension and Diabetes Mellitus) because according to the 2018 Semarang city health profile, hypertension and Diabetes Mellitus ranked third and sixth with a total of 4,319 and 3,429 respectively among patients participating in Prolanis.

Patients suffering from hypertension and Diabetes Mellitus will automatically register themselves as JKN participants to ease their burden from the costly medical treatment, especially for the poor. On this basis, this study aims to determine the prescription cost of patients under Prolanis in first-level facilities who require further treatment and who need the costly long-term and automatic rehabilitation.

2. RESEARCH METHOD

2.1. Research Design

This research was designed as observational analytic research with cross sectional design. Data were taken retrospectively at the Semarang City Health Center from the medical records of patients under Prolanis with the following inclusion criteria: Lamper Tengah Health Center, Mangkang Health Center, Mijen Health Center and Karanganyar Health Center in Semarang city, health centers collaborating with BPJS Kesehatan, health centers having complete medical records of patients with Type 2 Diabetes Mellitus and hypertension, and health centers who were willing to participate in the research. The exclusion criteria in this study were Puskesmas that did not cooperate with BPJS and those which did not have complete medical records.

2.2. Data Collection Method

The data were obtained from the medical records of patients under Prolanis, which were recorded in the data collection sheet. Then, the data were tabulated in an Excel data sheet by describing patients’ characteristics, including age, patient gender, patient diagnosis, number of drug items, type of medication, and total cost of patients’ medical care.

2.3. Data Analysis

Descriptive analysis was carried out to determine patient characteristics and the average price of the drug, while Spearman 'rho analysis was used to see the factors which affected the real prescription cost.

3. RESULTS AND DISCUSSION

The research was carried out from August 2020 to September 2020 through retrospective data collection of 800 prescriptions from August 2019 to August 2021 or medical records of patients under Prolanis at the abovementioned health centers in Semarang City.

3.1. Patient Characteristics

Patient characteristics were analyzed using a descriptive test. The results showed the patient distribution, which was dominated by the 45–64-year-old group with 583 patients (72.9%), female with 515 patients (64.4%), diagnosis of type 2 Diabetes Mellitus with 319 patients (39.9%), and patients receiving glimepiride and metformin with 170 patients (21.3%) with the 2 drug items taken presented in **Table 1**.

Table 1. Patient Characteristics

Patient Characteristics	Number of Patients	Percentage (%)
Gender		
Man	285	35.6
Woman	515	64.4
Age		
18-44	49	6.1
45-64	583	72.9
65 and over	168	21.0
Drug Items		
1	117	14.6
2	581	72.6
3	102	12.8
Diagnosis		
Type 2 Diabetes Mellitus	319	39.9
Hypertension	280	35.0
Type 2 Diabetes Mellitus, Hypertension	16	2.0
Type 2 Diabetes Mellitus, Hyperlipidemia	32	4.0
Hypertension, Antiplatelet	25	3.1
Type of Medicine		
Glimepiride, metformin	170	21.3
Glibenklamide, metformin	42	5.3
Amlodipine, vitamin B complex	66	8.3
Amlodipine 10 mg	43	5.4
Amlodipine, miniaspilet	43	5.4

3.2. Prescription Cost

The analysis on prescription costs was carried out with a descriptive test to determine the average direct cost of drugs based on gender, age, quantity of drug items, diagnosis of disease and types of drugs used as listed in **Table 2**.

Previous research by Baroroh and Fathonah (2017) stated that women who are at risk of comorbidities, such as hypertension, had an average cost of IDR 801,360 and dyslipidemia with an average cost of IDR 600,254. This research revealed those aged above 65 years old spent an average cost of IDR 135,476.

The finding in this study is not in line with the result revealed by Al-Maskari *et al.*, (2010), which explained that the costs will increase along with the increasing age, duration of diabetes and for patients treated with insulin as compared to patients treated with oral hypoglycemic or diet control. The findings on the number of antihypertensive and diabetes mellitus drug items in the prescription are in line with the result of previous research that the average drug item given by JKN participants was around 3.2 items per prescription sheet (Dianingati and Prasetyo, 2015).

The prescribing pattern in patients of type 2 diabetes mellitus under Prolanis was combination of glimepiride and metformin with as many as 170 (21.3%) at a cost of IDR 62,100 to 312,300. The cost of using monotherapy for the treatment of type 2 diabetes mellitus is cheaper than using combination drugs. The lowest cost for the drug use of type 2 diabetes mellitus was for the sulfonylurea group with IDR 19,042.5 ± 14,566.55 and the most expensive was spent for a combination of sulfonylurea + biguanid + -glycosidase with IDR 83,487.86 ± 328,73. It was known that patients with complications spent higher rates for medical treatment. Hypertension patients who received monotherapy were provided with Amlodipine 10 mg with a price range of IDR 75 to IDR 99. This is in line with the finding of previous studies, which stated that the highest cost for hypertensive patients was the cost of non-hypertensive drugs, since hypertensive patients with other chronic disease spent around IDR 44,750.49 ± 45,275.96 (Baroroh and Fathonah, 2017).

The analysis on the diagnostic characteristics showed that the highest number of patients was those diagnosed with Type 2 Diabetes Mellitus with 2,319 (39.9%) of patients and spent a range of IDR 30,600 – IDR 433,800. According to the International Diabetes Federation (2014) which states that the cost of medical care for Type 2 Diabetes Mellitus of patients in Indonesia reached USD 80.22 per Diabetes Mellitus patient/year, while the cost of treating Type 2 Diabetes Mellitus in other developing countries amounted to USD 50-80. 2,000 per Diabetes Mellitus patient/year.

Table 2. Prescription Costs

Patient Characteristics	Average cost of drugs (IDR)	SD	Min-Max (IDR)
Gender			
Man	125,808.95	92,914.627	22,500-945,000
Woman	129,896.85	80,382.659	22,500-547,200
Age			
18-44	108,424.90	68379.054	22,500-365,400
45-64	128,095.27	83739.577	22,500-945,000
>65	135,476.61	92936.154	22,500-585,000
Drug Items			
1	59,715.90	49226,537	22,500-342,000
2	130,52.10	80960,936	22,500-945,000
3	195,415.00	82086,975	22,500-593,700
Diagnosis			
Type 2 Diabetes Mellitus	142,293.10	57,233.752	30,600-433,800
Hypertension	112,735.93	99,943.773	22,500-945,000
Type 2 Diabetes Mellitus, Hipertension	127,209.38	62736,173	53,100-245,700
Type 2 Diabetes Mellitus, Hyperlipidemia	116,123.44	33568,882	60,000-189,000
Hypertension, Antiplatelet	87,782.40	82585,224	22,500-445,800
Drug Type			
Glimepiride, metformin	146,489.12	41,102.379	62,100-312,300
Glibenklamide, metformin	98,757.14	22,683.228	35,700-127,500
Amlodipine, vitamin B complex	103,529.56	14,126.081	40,860-109,800
Amlodipine 10 mg	35,507.45	18,623.392	22,500-121,200
Amlodipine, miniaspilet	147,277.78	198,837.337	29,700-945,000

3.3. Spearman's rho analysis

This study was carried out with nonparametric tests to determine the total cost of patients based on gender, age, disease diagnosis, quantity of drug items and types of drugs. These tests resulted in the P-value of <0.05, which indicated a significant correlation or effect while the P-value of > 0.05 revealed that it had no significant correlation or effect. This result is presented in **Table 3**.

Table 3. Spearman 'rho test results

	Gender	Age	Disease diagnosis	Number of medicinal items	Drug Type
Correlation Coefficient	0.042	0.047	0.075*	0.546**	0.209**
Sig.(2-Tailed)	0.240	0.186	0.033	0.000	0.000
Amount	800	800	800	800	800

Source: Research primary data
Information:
*** Significant with P<0.05
* = Significant with P<0.05

Spearman's Rho test analysis shows that the result for types of drugs with drug costs was indicated by the value of Asymp Sig. (2-tailed) i.e., 0.000, which had a significant, a positive, and a strong correlation. In other words, the more types of drugs given, the higher the prescription cost. The International Diabetes Federation (2014) stated that the cost of care for Type 2 Diabetes Mellitus patients in Indonesia amounted to USD 80.22 per Diabetes Mellitus patient/year, and the cost is expected to increase every year.

The variable of female, age, and disease diagnosis did not show any significant correlation with P-Value of 0.240, 0.186 and 0.033. The results of this study are in line with those of previous research, which was carried out by Watetu *et al*., (2019) at the Kiambu District Hospital, Kenya for Type 2 Diabetes patients, which showed that there were 91 women (59.5%) and 62 men (40.5%). %). The finding in this research is also reinforced by previous research by Baroroh et al., (2016) that women have a risk of comorbidities such as hypertension and had an average cost of IDR 801,360 and dyslipidemia with an average cost of IDR 600,254.

From the direct observation, the various limitations in this research serve as some factors that require further attention for researchers who wish to carry out further research improvements. This study did not conduct a cost analysis based on the number of capitations given by BPJS to health facilities because the possibility can affect the pattern of prescribing and drug costs incurred. In addition, the research was only focused on the PROLANIS program and did not analyze other chronic diseases.

4. CONCLUSION

The average drug cost for type 2 Diabetes Mellitus patients was IDR 142,293 and for hypertensive patients was IDR 112,735. The pattern of prescribing in Prolanis patients for type 2 Diabetes Mellitus patients was a combination of glimepiride, metformin with a drug price of IDR 20,670. Factors that affected prescription costs were diagnosis p=0.033, type of drug (p=0.000) and drug item (p=0.000). This study concludes that the factors that affect the drug costs of Prolanis patients at the Semarang City Health Center were the patient's diagnosis, the type of drug given and the number of drug items given. It is recommended to carry out similar research by linking between the number of capitations obtained from BPJS to health facilities and network pharmacies that collaborate with BPJS. It is also good to conduct further research by relating with other chronic diseases.

5. CONFLICT OF INTEREST

The author has no conflict of interest to declare in this research.

6. ACKNOWLEDGMENT

A grateful acknowledgement is extended to Research Unit of the Pharmaceutical Program, Faculty of Medicine, Universitas Islam Sultan Agung, Semarang for funding this research.

7. REFERENCES

Al-Maskari, F., El-Sadig, M. and Nagelkerke, N. (2010) 'Assessment of the direct medical costs of diabetes mellitus and its complications in the United Arab Emirates', *BMC Public Health*, 10, pp. 1–10. doi: 10.1186/1471-2458-10-679.

Ann Watetu, T. *et al.* (2019) 'Characteristics of Type 2 Diabetes Patients and Their Association with the Metabolic Syndrome and Cardiovascular Risk Factors at Thika Level Five Hospital in Kenya', *International Journal of Diabetes and Endocrinology*, 4(2), p. 35. doi: 10.11648/j.ijde.20190402.11.

Aodina, F. W. (2019) 'Higeia Journal of Public Health', *Higeia Journal of Public Health Research and Development*, 1(3), pp. 625–634.

Arifa, A. F. C. (2018) 'Pengaruh Informasi Pelayanan Prolanis Dan Kesesuaian Waktu Terhadap Pemanfaatan Prolanis Di Pusat Layanan Kesehatan Unair', *Jurnal Administrasi Kesehatan Indonesia*, 6(2), p. 95. doi: 10.20473/jaki.v6i2.2018.95-102.

Ayu, D. P. S. D., Satibi and Diah, A. P. (2015) 'Analisis Biaya Obat Pada Era Jkn Dan Faktor-Faktor Yang Mempengaruhi Di Fasilitas Penunjang Kesehatan Daerah', *Manajemen dan Pelayanan Faramasi*, 5(4), pp. 291–300.

Badan Penelitian dan Pengembangan Kesehatan (2013) 'Riset Kesehatan Dasar (RISKESDAS) 2013', *Laporan Nasional 2013*. doi: 1 Desember 2013.

Baroroh, F. and Fathonah, S. S. (2017) 'Biaya Medik Langsung Terapi Hipertensi Pasien Rawat Jalan Di Rumah Sakit X Yogyakarta', *Jurnal Farmasi Sains dan Praktis*, 3(2), pp. 6–13. doi: 10.31603/pharmacy.v3i2.1724.

Bello Garcés, S. (2018) 'Ideas previas y cambio conceptual', *Educación Química*, 15(3), p. 210. doi: 10.22201/fq.18708404e.2004.3.66178.

Depkes RI (2014) 'Peraturan Menteri Kesehatan Republik Indonesia Nomor 27 Tahun 2014 tentang Petunjuk Teknis Sistem Indonesian Case Base Groups (INA-CBGs)', *Kementerian Kesehatan RI*.

Dianingati, R. S. and Prasetyo, S. D. (2015) 'Analisis Kesesuaian Resep untuk Pasien Jaminan Kesehatan Nasional dengan Indikator Peresepan WHO 1993 pada Instalasi Farmasi Rawat Jalan di RSUD Ungaran Periode Januari-Juni 2014', *Majalah Farmaseutik*, 11(3), pp. 362–371.

Ernawati, C. T. and Uswatul, D. (2019) 'Hubungan Kepesertaan JKN Mandiri dengan Pendapatan, Pengetahuan, Persepsi, Akses, dan Kepercayaan Masyakat Suku Sakai di Desa Petani Kecamatan Mandau Kabupaten Bengkalis Tahun 2018', *Jurnal Kebijakan Kesehatan Indonesia : JKKI*, 8(1).

ES, H. S., Decroli, E. and Afriwardi, A. (2018) 'Faktor Risiko Pasien Nefropati Diabetik Yang Dirawat Di Bagian Penyakit Dalam Rsup Dr. M. Djamil Padang', *Jurnal Kesehatan Andalas*, 7(2). doi: 10.25077/jka.v7i2.794.

International Diabetes Federation (2014) 'Idf Diabetes Atlas 2014 Update', *Diabetes Atlas, six edition*.

Rosdiana, A. I., Raharjo, B. B. and Indarjo, S. (2017) 'Implementasi Program Pengelolaan Penyakit Kronis (Prolanis)', *Higeia Journal of Public Health Research and Development*, 1(3).

Watetu, T. A., Beatrice, K. N., Onyango Arnold, N., & Anselimo, M. (2021). Characteristics of type 2 diabetes patients and their association with the metabolic syndrome and cardiovascular risk factors at Thika level five Hospital in Kenya.

WHO (2016) 'WHO Global report on diabetes: A summary', *International Journal of Noncommunicable Diseases*, 1(1). doi: 10.4103/2468-8827.184853.