

PRESCRIPTION COST ANALYSIS IN PATIENTS WITH HYPERTENSION AND TYPE 2 DIABETES MELITUS AFTER THE IMPLEMENTATION OF INDONESIAN NATIONAL HEALTH INSURANCE (A STUDY AT THE INDEPENDENT PHYSICIAN PRACTICE IN TEGAL REGENCY)

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ABSTRACT

Chronic disease is a long-term health condition that requires on-going medical attention, and is classified as a non-communicable disease. The long-term medical treatment for chronic diseases, such as type 2 diabetes mellitus and hypertension are considerably costly. This study aims to determine the real cost and pattern of drug prescribing as well as the factors affecting the real Prescription Cost for hypertension and type 2 diabetes mellitus after the implementation of Indonesian National Health Insurance (JKN) as seen from the practice of Independent Physical in collaboration with BPJS Kesehatan (Healthcare and Social Security Agency). This is a non-experimental (observational) study. The data were collected using purposive sampling method with 147 medical prescriptions as the research samples for each type of disease from the patient's medical record. Data were analyzed descriptively to determine Prescription Costs and spearman's rho test was used to determine the factors that influence Prescription Costs. The study revealed that the average Prescription Cost for type 2 DM patients was Rp17.806, - and Rp12.946 for hypertensive patients. Factors that affected Prescription Cost were diagnosis ($p=0.026$), type of medicine ($p=0.000$) and drug items ($p=0.000$). This study concludes that patients with diabetes mellitus were treated with the drug prescription pattern of a combination of metformin and glimepiride, while patients with hypertension were provided with amlodipine. The real Prescription Cost is influenced by several factors, including; the patient's diagnosis, the type of drug given and the number of drug items provided to patients.

Keywords: Chronic disease; Prescription Cost; Type 2 Diabetes Mellitus; Hypertension; JKN

1. INTRODUCTION

Chronic diseases are long lasting condition with a persistent effect in the body that is mostly not recognized and is difficult to cure, which contributes to the reason why it becomes the leading cause of high mortality rates globally (Wahyudi et al., 2021). Chronic diseases are very dangerous, mostly caused by an unfavorable lifestyle, such as smoking, alcohol, poor nutrition, lack of exercise and others (Bestari & Wati, 2016). Chronic diseases with high prevalence rate in Indonesia are diabetes mellitus and hypertension, with a prevalence of 8.8% and 31.7% respectively. Diabetes mellitus ranks as the 3rd largest cause of death in Indonesia (6.7%) and cases of hypertension with complications are the 5th leading cause of death in Indonesia (5.3%) (Ariana et al., 2019). The data obtained from the Tegal Regency Health Office 2017 revealed that

diabetes mellitus and hypertension are included in the top 10 diseases that require considerable attention in Tegal Regency. The prevalence rate of diabetes mellitus is 12.98%, ranking the 2nd disease concerned to watch out for in Tegal Regency, while hypertension ranks 1st disease to be prioritized in Tegal Regency with 58.98% (Setiaji et al., 2018).

Chronic diseases, such as diabetes mellitus and hypertension, require long-term treatment which incurs considerable costs for the patient. Diabetes mellitus and hypertension are known to cause complications, which can increase the Prescription Cost for patients (Ariana et al., 2019). The Indonesian government has launched a non-communicable and chronic disease management program known as Indonesian Chronic Disease Management Program (PROLANIS). Prolanis is a program of the National Health Insurance (JKN) run by the Social Security Administration (BPJS). Prolanis is carried out by first-level health facilities (FKTP), one of which is an independent physician (Ariana et al., 2019). Participants can take Prolanis if they are identified as having type 2 diabetes mellitus or hypertension (Wardani et al., 2018).

According to a 2017 report from BPJS, diabetes mellitus and hypertension are chronic diseases that incurs a fairly considerable health care spending. The cost of chronic drugs outside the INA case base group (CBG) package or capitation to be incurred in 2014-2016 was IDR 889 billion for diabetes and Rp1.05 trillion for hypertension. The largest spending was on drugs for diabetes mellitus and hypertension. The cost of drugs from these chronic diseases reaches Rp1.95 trillion or 78% of the total costs of chronic drugs outside the INA case base group (CBG) and capitation packages (BPJS, 2017) of chronic disease patients every year. Therefore, it is necessary to update data related to the Prescription Cost for chronic disease in primary services to support data for policy makers. This study aims to determine the real cost and pattern of drug prescription as well as the factors that affect the real cost of drugs for hypertension and type 2 diabetes mellitus after the implementation of JKN in first-level health facilities, particularly among independent physicians.

2. METHOD

2.1. Research Design

This study was designed as a non-experimental (observational) study with a cross sectional design. This study was approved by the Health Research Ethics Commission of the Sultan Agung Hospital with the approval No. 15/EC/KEPK/2020/. Data were taken retrospectively at independent physicians in Tegal City from all medical records of patients with diabetes mellitus and hypertension with the following inclusions: medical prescriptions for patients with chronic disease of hypertension and type 2 diabetes mellitus who participate the JKN program, patients aged at least 45 years, and medical record covering age, gender, and name of the drug given. The exclusion criteria in this study were incomplete medical record data and illegible medical records.

2.2. Data Collection Method

The data were collected using purposive sampling method with the 560 number of samples of patient prescriptions. The data were taken from the medical records of patients with primary diagnosis of hypertension and diabetes mellitus at independent physician practices, which were recorded in data collection sheets. Subsequently, the data were tabulated in Excel data sheets followed by descriptive analysis from SPSS. Data were in the form of patient characteristics, including age, gender, patient diagnosis, number of patient drug items, type of patient medication and total medical care of patient.

2.3. Data Analysis

The total Prescription Cost of patients was calculated by multiplying the hypertension or diabetes medication issued (in prescription) by the cost of each drug according to the price of the e-catalog. The data were descriptively analyzed with SPSS as a way to explain the characteristics

of respondents, consisting of age group, gender, type of drug, drug item, and diagnosis. Spearman's rho analysis was used to look at the factors that affect the real Prescription Cost.

3. RESULTS AND DISCUSSION

This research was conducted in July 2020 - January 2021 at 2 independent physician practices in Tegal Regency from 26 medical practices in collaboration with BPJS Kesehatan. This study aims to determine the real cost and pattern of drug prescribing as well as the factors to affect the real cost of drugs for hypertension and type 2 diabetes mellitus after the implementation of JKN in first-level health facilities, particularly at the practice of independent physicians. Medical care costs for patients with hypertension and diabetes mellitus are listed in Table 1.

Table 1. Costs of Medical Care for Hypertensive and Diabetes Mellitus Patients Based on Patient Characteristics

Patient Characteristics	N(%) 560(100)	Average Prescription Cost (Rp)	SD (Rp)	Min-Max (Rp)
Gender				
Man	257(45.9)	16.718,-	8.372,-	2.250 - 39.270
Woman	303(54.1)	17.292,-	7.435,-	2.970 - 48.720
Age				
45-59	278(49.6)	17.489,-	8.162,-	2.250 - 48.720
60-75	247(44.1)	16.552,-	7.689,-	2.250 - 44.220
76-90	14(2.3)	19.083,-	7.071,-	5.280 - 29.880
Drug Items				
< 3	112(20)	10.968,-	6.354,-	2.250 - 35.430
> 3	448(80)	18.544,-	7.488,-	2.970 - 48.720
Diagnosis				
Type 2 diabetes mellitus	158(28.2)	17.806,-	6.792,-	3.570 - 36.390
Hypertension	139(24.8)	12.948,-	7.824,-	2.250 - 37.920
Type 2 diabetes mellitus, hypertension	203(36.3)	19.536,-	7.457,-	2.970 - 44.220
Type 2 diabetes mellitus, Hypertension, joint pain	18(3.2)	17.373,-	4.229,-	11.130 - 25.200
Hypertension, joint pain	9(1.6)	15.949,-	5.828,-	6.660 - 27.270
Hypertension, headache	9(1.6)	14.338,-	5.909,-	3.720 - 24.225
The Top Six Types of Drugs Consumed by Prolanis Patients				
amlodipine,		10.447,-	2.998,-	3.070 - 15.370
metformin, glimepiride, captopril, Sobobion		22.582,-	4.466,-	9.190 - 26.880
metformin, glimepiride, amlodipine, b complex		21.404,-	4.766,-	3.070 - 26.940
glimepiride, metformin		13.885,-	6.517,-	3.570 - 29.880
glimepiride, metformin, amlodipine		14.910,-	6.723,-	2.970 - 38.580
glimepiride, metformin, b complex		18.457,-	8.830,-	6.780 - 36.390

3.1. Patient Characteristics

Table 1 indicates that patients who visit independent physicians were mostly women (303/54.1%) at the age group of 60-75 (247/44.1%) with the highest average cost of female patients spending IDR 17,292 at those at the age group of 76-90 spending IDR 19,083. This result is not in line with that of the previous research conducted by (Sulistyaningrum et al., 2021), which revealed that the medical care costs spent by males tend to be 14-26% higher. The high cost of drugs in women is related to different drug prescribing patterns, especially patients with complications such as hyperlipidemia, heart failure, and hypertension. Female patients tend to suffer from chronic diseases than men because they are related to excretion of estrogen. During menopause, the level of estrogen in women tend to decrease, which previously protects them from damaged blood vessels (Khomarun et al., 2014).

During menopause, women will experience a physiological decline, particularly in the function of body organs, one of which is the endocrine system which decreases the function of

pancreatic beta cells that produce insulin, making them susceptible to diabetes mellitus (Erni & Ning, 2017). The physiological decline in hypertensive patients is related to cardiac output and peripheral resistance, the renin-angiotensin system and the autonomic nervous system (Yonata & Pratama, 2016). Diabetes mellitus is a disease that has a high prevalence in elderly patients. The cost of treating chronic diseases in the elderly has increased by 14% over the last five years. Most of the costs are related to type 2 diabetes mellitus and comorbidities (Sulistyaningrum et al., 2021).

The analysis on the drug items showed that chronic diabetes mellitus and hypertension were provided with more than 3 drug items at a cost of Rp 18,544,-. This is in line with previous research which showed that patients were prescribed more than 3 drug items. In addition, WHO determines the drug item indicator is more than 3 (R/) per prescription (Sulistyaningrum et al., 2021).

3.2. Disease Diagnosis Against Prescription Cost

The highest average cost was spent for patients with complications of type 2 diabetes mellitus and hypertension, followed by patients with a diagnosis of type 2 diabetes mellitus with an average cost of Rp19,536. The International Diabetes Federation (IDF) (2014) stated that the cost of medical care for type 2 diabetes mellitus patients in Indonesia reached USD 80.22 per DM patient/year, while the cost of medical treatment of type 2 diabetes mellitus in other developing countries amounted to USD 50-2,000 per DM patient/year. In Indonesia, the price range for the treatment of type 2 diabetes mellitus is low, which is due to the lack of intensive management of type 2 diabetes mellitus patients (Abror et al., 2019). Patients with complications tend to incur larger spending (Baroroh & Fathonah, 2017).

3.3. Types of Drugs Against Prescription Costs

The most commonly prescribed types of drugs are amlodipine and b-complex drugs with an average cost of Rp 10,447. This is in accordance with previous research demonstrating that the most widely used hypertensive disease is the Calcium Channel Blocker (CCB) group in amlodipine tablet treatment (Muti & Octavia, 2018). The most prescribed drug for type 2 diabetes mellitus is metformin-glimepiride at a cost of Rp13,885. According to Almasdy et al (2015), the commonly used antidiabetic drug is a combination of metformin and glimepiride. In general, antidiabetic drugs work by increasing insulin secretion and are only effective in type 2 diabetes mellitus. These findings are in line with research conducted by (Sulistyaningrum et al., 2021), revealing that treatment of hypertension with amlodipine and treatment of type 2 diabetes mellitus with the combination metformin-glimepiride is more economical.

3.4. Factors Affecting Prescription Costs

The results of the study presented in Table 2 indicates the correlation between the influencing factors including age, gender, patient diagnosis, type of drug given, and number of drug items with the real cost of drugs in patients participating in Prolanis.

Table 2. Results of Spearman's Rho. Test Against Factors Affecting Prescription Costs

Factor	Sig. (2-tailed)	Correlation Coefficient
Gender	0.173	0.058
Age	0.174	-0.058
Medicinal Items	0.000*	0.404
Type of Medicine	0.000*	-0.212
Diagnosis	0.026*	0.094

Sig: P-value <0.05

Spearman's Rho analysis showed that gender and age group did not have any significant correlation with Prescription Costs (p-value > 0.05). These results are in line with the finding of previous research conducted by (Sulistyaningrum et al., 2021), which revealed that gender and

age had no significant effect on Prescription Costs. The number of drug items and Prescription Costs are significantly related with p -value <0.05 , which means that drug items are significantly and closely related and are unidirectional in nature, since the more drug items prescribed, the greater the Prescription Costs incurred. The relation between the type of drug and Prescription Cost resulted in a p -value <0.05 , which indicated a significant correlation. These results highlighted that the treatment of hypertension with amlodipine and type 2 diabetes mellitus using a combination of glimepiride and metformin is more affordable. This finding is in line with previous studies that the use of amlodipine alone for hypertensive patients, and the combination of glimepiride and metformin for type 2 diabetes mellitus is significantly more economical (Sulistyaningrum et al., 2021). The structure of drug prices in Indonesia is lack of transparency, and thus drug prices in Indonesia are quite expensive. The average cost of drugs in public sector health facilities or those facilitated by the government is lower than the private sector, because they apply price regulation in accordance with the supply system (Jo, 2016). Diagnosis is significantly related with Prescription Costs with p -value <0.05 , meaning that there is a significant correlation between diagnosis and Prescription Costs, where the more patients diagnosed with multiple diseases or patients having comorbidities, the higher the Prescription Cost. These results are in accordance with previous research conducted by (Baroroh & Fathonah, 2017), pinpointing that the price of antidiabetic drugs is lower than the price of complication drugs, and this result is reinforced by a research conducted in the United Arab Emirates (UAE), which disclosed that the cost of medical care of diabetes mellitus has increased by 2, 2-fold with the presence of diabetes mellitus related complications (Al-Maskari et al., 2010).

4. CONCLUSION

The average Prescription Cost in hypertensive patients is Rp12.948, - and in patients with type 2 diabetes mellitus is Rp17.806,- Patients with type 2 diabetes mellitus is provided with a prescribing pattern of a combination of metformin, glimepiride, while hypertensive patients are given amlodipine. Factors that affect Prescription Costs are patients' diagnosis, type of drugs and number of drug items provided to patients. It is recommended to conduct further research by linking between the number of capitations obtained from BPJS and health facilities, and it is also recommended to conduct further research by addressing other chronic diseases.

5. ACKNOWLEDGEMENT

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6. CONFLICT OF INTEREST

The author declares that there are no competing conflicts of interest.

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