The Impact of Pharmaceutical Care Implementation on The Incidence of Drug-Related Problem and Clinical Outcome of Hypertension Patients at Puskesmas Lubuk Pakam in 2021

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ABSTRACT: The role of pharmacists in the implementation of pharmaceutical care has been shown to improve the outcome of therapy in hypertension patients in various countries. This study aimed to implement pharmaceutical care for hypertension patients and determine its impact on the incidence of drug-related problems (DRPs) and clinical outcomes of hypertension patients in Puskesmas Lubuk Pakam. This study used a comparative experimental method before and after the intervention of 73 hypertension patients in March-August 2021. Identification of the of DRPs was using the PCNE V9.00 standard and blood pressure values were obtained from direct examination of patients. Data were analyzed using the Wilcoxon Signed-Rank test. The results showed that the average DRPs incidence was significantly reduced after the intervention (observation, interview, and education) on the hypertension patients. The average blood pressure before intervention was 154.38 ± 16.20 mmHg and after intervention became 144.04 ± 15.94 mmHg (p value = 0.000). Based on the results of the study, it can be concluded that the application of pharmaceutical care can reduce the incidence of DRPs and improve clinical outcomes in hypertension patients in Puskesmas Lubuk Pakam.

Keywords: clinical outcome; DRPs; hypertension; pharmaceutical care

1. Introduction

Hypertension is a non-communicable disease but one that must be watched out for at this time that can attack anyone without any age limit with a systolic blood pressure of more than 140 mmHg and a diastolic blood pressure of more than 90 mmHg [1]. As people get older, their blood pressure slowly increases. Hypertension is often referred to as the silent killer because it can cause death without any symptoms felt by the patient. Hypertension itself is classified into two types, namely primary (essential) hypertension for which the exact cause is unknown and secondary (non-essential) hypertension which can be caused by diseases such as kidney, heart, endocrine, and adrenal gland disorders [2].

Hypertension is the biggest contributor to the burden of various chronic diseases that lead to death and premature birth. Besides causing heart failure, hypertension can result in kidney failure and cerebrovascular disease. This disease is res–ponsible for the length of treatment therapy and the high cost of treatment due to the reasons for the high number of visits to the doctor, length of stay in the hospital, and long-term drug use [3].

Pharmaceutical care as a pharmacist's practice activity is an important element in health services, where pharmacists are responsible for the quality of service and ensuring the suitability, effectiveness, and safety of drug therapy by identifying, preventing, and resolving drug therapy problems that patients receive [4]. The application of pharmaceutical care can be used as a stra–tegy for optimizing the quality of life of patients and the therapeutic outcomes to be achieved by addressing problems related to treatment as best as possible [5]. As a major factor contributing to the patient's quality of life, drug-related problems (DRPs) are events or circumstances that can actually (actually) or potentially affect the desired therapeutic outcome. Treatment that is not optimal causes clinical outcomes to be not as desired, which can lead to complications, increase the risk of premature death, and significantly contribute to mortality, costs, and low quality of life [6]. This study was aimed to conduct research related to the application of pharmaceutical care in patients with hypertension, contributed in reducing the incidence of DRP and increasing clinical outcomes in inpatients at Puskesmas Lubuk Pakam.

2. Methods

2.1. Samples

Research data collection was carried out from March 2021 to August 2021, with a division of time from March to May data collection before the intervention, data collection from June to August after the intervention. This study involved 73 hypertensive patients who met the inclusion criteria (patients with hypertension at Puskesmas Lubuk Pakam in March–August 2021 and aged over 18 years with or without complications and comorbidities). Exclusion criteria were patients who are not willing to be research subjects and patients with mental disorders or death.

2.2. Methods

The study design used in this investigation was a cohort analytic method-prospective study before and after the intervention (observation, interview, and education) of hypertensive patients at Puskesmas Lubuk Pakam. Data collection was carried out on direct patients, medical record data, patient referral book data (PRB), data from patient prescriptions, data from the drug room, and data collected were the incidence of DRPs and clinical outcomes. Identification of DRPs in this study used the PCNE V9 instrument. All the data obtained were analyzed statistically using the Wilcoxon test in the SPSS V22.0 program.

3. Results and Discussion

3.1. Characteristics of hypertensive patients

The target population in this study were all hypertensive patients, both general patients and

BPJS patients and referral patients who redeemed prescriptions at Puskesmas Lubuk Pakam from March to August 2021, with a total of 112 patients. However, only 73 patients that used as the sample who met the inclusion criteria. Characte–ristics of hypertension patients based on gender, age, education level, occupation, length of illness, and comorbid diseases can be seen in Table 1.

Based on Table 1 it can be seen that the majo–rity of hypertension sufferers are female as much as 63.01% while 36.99% are male. The results of this study showed that the average age of hyper-tensive patients with an age distribution of 45-65 years was 78.08% and ages over 65 years were 27.39%. The proportion of hypertension patients in this study according to educational level was dominated by a senior high school education background of 45.20%. Based on occupation, the majority of people with hypertension work as private companies/traders/laborers, which is 50.68%. Moreover, by seeing the duration of suf-fering from hypertension, this study showed that the majority of hypertensive patients had a dura-tion of illness of 1 to 5 years of 56.16%, followed by the duration of illness of more than 5 years of 35.16%, and duration of illness of less than 1 year of 4.10%. Long-suffering from hypertension often does not describe the actual disease process. This is because many hypertension patients are newly diagnosed when they experience complications, even though the course of the disease has been going on for years before but has not been diag-nosed. Based on the comorbidities suffered by hy-pertension patients, the results showed that hy-pertensive patients were dominated by 61.64% who did not have comorbidities and 38.35% who had comorbidities. Interestingly, we found that diabetes (42.86%) was the major comorbid in hy-pertension patients, followed by hyperlipidemia (28.57%) and upper respiratory tract infection (28.57%).

3.2. Intervention impact on drug-related problems (DRPs) in hypertensive patients

A potential drug-related problem is a condi-tion that can cause morbidity or death if no action

Table 1. Characteristics of hypertension patients in Puskesmas Lubuk Pakam

Characteristic	Category	Amount (Percentage)
Sex	Female	46 (63.01)
	Male	27 (36.98)
Age	45-65	49 (67.12)
	> 65	24 (27.39)
Education	Elementary	14 (19.17)
	Junior high school	24 (32.87)
	Senior high school	30 (41.09)
	University	5 (6.84)
Occupation	Government worker	3 (4.10)
	Private/traders	35 (47.94)
	Unemployed	27 (36.98)
	Retired	8 (10.95)
Duration of illness	< 1 year	6 (8.21)
	1-5 year	41 (56.16)
	> 5 year	26 (35.16)
Comorbid disease	With comorbid	40 (54.79)
	Without comorbid	33 (45.20)

is taken, whereas actual drug-related problems are manifested by the presence of signs and symptoms [7]. There are several classification systems presented in the literature regarding the classification of DRPs, however, our study uses a classification system based on PCNE version 9.00 because the problems and causes of DRPs are des–cribed in more detail making it easier to review the interventions to be carried out [8]. The occurrence of DRPs is classified based on the category of problem groups and causes.

Data obtained from the identification of DRPs in hypertension patients before intervention based on the problems and causes groups can be seen in Table 2. The results of this study showed that out of a total of 73 Hypertension patients, 51 patients (69.86%) experienced DRPs and 22 people (30.14%) did not experience DRPs. Of the 51 patients who experienced DRPs, there were 56 incidents of DRPs. The greatest incidence of DRPs was found in the group with problems with the effectiveness of therapy with 51 events (91.07%) with the majority of the classification of non-optimal drug therapy effects with 39 events (69.64%), followed by symptoms not treated in 12 events (21.43%). In addition to the problem of the effectiveness of therapy, there is also a group of problems with therapy safety and adverse drug reactions with 5 events (8.93%) respectively.

Every drug-related problems (DRPs) that occur has a cause. Based on Table 2 it can be seen that the causes related to the patient were 41.07%, the causes for treatment duration were 14.28%. Both other causes (related to diet and physical activity) and drug selection consist of 10.71% of total causes Causes of drug form selection and drug use process represent 8.93% respectively. Causes due to dose selection consist of 5.35%. The use of drugs that are less than prescribed or patients do not use drugs at all is due to the patient's lack of knowledge and understanding regarding treatment and controlling blood glucose levels. Based

Table 2. The incidence of DRPs is based on problem groups and causes before the intervention

Code	Problem classification	Before intervention	
		Number of events	Percentage (%)
P	Problem	56	100
P.1	Effectiveness	51	91.07
P.1.1	Ineffective drug therapy	39	69.64
P.1.2	Symptoms not treated	12	21.43
P.2	Therapy safety	5	8.93
P.2.1	Adverse drug reaction	5	8.93
Code	Causes classification	Number of events	Percentage (%)
C	Causes	56	100
C.1	Drug selection	6	10.71
C.2	Drug form	5	8.93
C.3	Dose selection	3	5.35
C.4	Treatment duration	8	14.28
C.5	Drug use process	5	8.93
C.6	Patients taking less medication than prescribed or not taking any drugs	23	41.07
C.7	Others	6	10.71

on the results of interviews during the initial assessment, there are still patients who take antihypertensive drug only when they remember or when their blood pressure rises.

The occurrence of DRPs identified by the pharmacist was then monitored and counseling is carried out on the patient to be advised to return to consult with the prescribing doctor (if needed). After monitoring, an evaluation is carried out regarding the occurrence of DRPs that have been identified during the initial assessment. The number of incidents of DRPs after intervention based on problem groups and cause groups can be seen in Table 2.

The incidence of DRPs decreased after the intervention. Based on the Wilcoxon statistical analysis, there is a significant difference between the incidence of DRPs based on the problem group and the cause group before the intervention and after the intervention with the *p*-value = 0.000.

The involvement of pharmacists in providing interventions in the form of pharmaceutical care has a major influence on reducing the incidence of DRPs. Based on Table 3, the percentage of reduction in problem groups and cause groups is 80.35%. The success of treatment was influenced by patient adherence to treatment which is a

Table 3. The incidence of DRPs is based on problem groups and causes after the intervention

Code	Problems classification	Number of events		% Decrease	Wilcoxon test (*p*-value)
		Before intervention	After intervention		
P	Problem	56	11	80.35	
P.1	Effectiveness	51	11	78.43	
P.1.1	Ineffective drug therapy	39	8	79.48	
P.1.2	Symptoms not treated	12	3	75.00	0.000
P.2	Therapy safety	5	0	100	
P.2.1	Adverse drug reaction	5	0	100	
Code	Causes classification	Before intervention	After intervention	% Decrease	Wilcoxon test (*p*-value)
C	Causes	56	11	80.35	
C.1	Drug selection	6	0	100	
C.2	Drug form	5	0	100	
C.3	Dose selection	3	0	100	
C.4	Treatment duration	8	3	62.5	
C.5	Drug use process	5	0	100	0.000
C.6	Patients taking less medication than prescribed or not taking any drugs	23	5	78.26	
C.7	Others	6	3	50.00	

Table 4. Types of given intervention

Intervention groups	Classification	Number of intervention	Percentage (%)
Prescription level	Intervention was proposed to the prescriber	11	15.07
Patient level	Counseling (medicine) of patients	42	57.53
	Delivered to family members	20	27.40
Total		73	100

Table 5. Blood pressure values of hypertensive patients before and after the intervention

Clinical outcome	Before intervention	After intervention	Wilcoxon test (*p*-value)
Blood pressure	154.38 ± 16.20	144.04 ± 15.94	0.000

major factor in the outcome of therapy. The lack of patient knowledge about the disease and its treatment causes patients to have low motivation to change their behavior or to be less compliant in taking medication resulting in the consequences of non-compliance treatment [9]. Another cause of DRPs for the problem group is that the effect of drug therapy is not optimal which is not accor–ding to the guidelines/formulary.

Based on Table 4, the interventions carried out by pharmacists were dominated by the interven-tion group at the patient level, which consist of patient counseling (medicine) with 42 interven-tions (57.53%) followed by interventions by con-veying to family members/family who cared for 20 interventions (27.40%) and the smallest per-centage, namely the intervention proposed to the prescriber, was 11 interventions (15.07%). This happens because the main causal factor for the occurrence of DRPs is related to the patient, in this case, the patient's adherence to taking medi-cation and the patient's lifestyle.

3.3. Intervention impact on the clinical outcome of hypertension patients

The therapeutic outcome is the result of the intervention provided by the health system and medical personnel to those who are the tar-get of the intervention [10]. Rational therapy in the treatment of hypertension can improve the achievement of clinical outcomes [11], for exam–ple, controlled blood pressure in hypertension patients. In this study, we used blood pressure as the clinical outcome. According to JNC VIII, one of the criteria for diagnosing hypertension is when blood pressure is above 140/90 mmHg in adults with at least three measurements [12]. One indi-cator of successful therapy can be seen if blood pressure is below 140/90 mmHg. Blood pressure measurements were carried out only at the pre-intervention and post-intervention stages. The measurement was carried out 3 months after the initial assessment in hypertensive patients. Blood pressure values before and after the intervention can be seen in Table 5.

According to Wilcoxon statistical analysis, we obtained a *p*-value = 0.000 and concluded that there was a significant difference between the ave–rage blood pressure values before the interven-tion. These results are in line with the meta-ana–lytic study conducted by Santschi, et al. (2014) which stated that the intervention treatment given by pharmacists to hypertensive patients was able to reduce blood pressure [13].

Pharmacists as one of the health partners of hypertension patients have full duty and respon-sibility for the patient's clinical outcome [14]. During the study period, patients were given education and counseling regarding therapeutic regimens, the effectiveness of treatment in im-

proving better clinical outcomes. Pharmaceutical care carried out by pharmacists has changed the outcome parameters of therapy for the better and needs to be continuously socialized, because in essence the goal of treatment is not only to cure patients but also to return patients to normal people as they were before suffering from an illness [4,15,16].

4. Conclusion

Based on the results of this study, it was concluded that the application of pharmaceutical care can reduce the number of DRPs in hypertensive patients and improve clinical outcomes in hypertensive patients at the Puskesmas Lubuk Pakam.

Acknowledgment

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