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THE EFFECT OF HOME PHARMACY CARE EDUCATION ON BLOOD PRESSURE CONTROL AND KNOWLEDGE LEVEL OF HYPERTENSIVE PATIENTS AT PUSKESMAS KENDALSARI MALANG

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ABSTRACT

Hypertension is one of the ten most common degenerative diseases and has a high mortality rate. The prevalence of hypertension in Malang City in 2020 reached 35,641 cases. The role of pharmacists as care givers in home pharmacy care can help control hypertension and reduce morbidity. Knowing the effect of home pharmacy care on hypertension patients' knowledge and blood pressure management is the main objective of this study. This study uses a quantitative experimental design with a Randomized Control Trial method, with a total of 34 respondents divided into 2 groups, namely the control group and the test group of 17 respondents each. By using accidental sampling technique. The research location was at Puskesmas Kendalsari Malang in August 2023. Blood pressure data was measured using a tensimeter, and knowledge level data using a knowledge questionnaire. Data analysis using paired T-Test and pooled T-Test test. The results of the analysis of the effect of home pharmacy care on the level of patient knowledge about hypertension with a significance value (2tailed) $p = 0.000$, and analysis of the effect of home pharmacy care on systolic and diastolic blood pressure with a significance value (2tailed) $p = 0.030$. The results of this study concluded that home pharmacy care in hypertensive patients had a good effect on blood pressure control, and increased knowledge at Puskesmas Kendalsari Malang.

Keywords: Home pharmacy care, hypertension, blood pressure control, knowledge level.

INTRODUCTION

High blood pressure, also known as hypertension, is often a silent killer. A person is considered to have hypertension if their blood pressure exceeds the normal value of 140/90 mmHg (Murwani et al., 2023). Worldwide, high blood pressure is a common disease in adults and is also common in children. Risk factors for hypertension include genetic factors, environment, and bad habits. One of the risk factors for cardiovascular disease (CVD), including heart disease, vascular disease, stroke, and kidney failure (Bakris & Sorrentino, 2017).

The prevalence of hypertension according to the World Health Organization (WHO) in 2020 amounted to 1.28 billion people in the world. Two-thirds of them are in low-moderate-income developing countries, one of which is Indonesia. WHO estimates that the prevalence of hypertension will continue to increase by 29% by 2025 (WHO, 2023). Likewise, in Indonesia, the rate of hypertension is increasing from 25.8% in 2013 to 34.1% in 2018 (Riskseddas, 2018). Based on the results of the Basic Health Research in 2018, the incidence of hypertension in East Java Province experienced a significant increase from 26.4% in 2013 to 36.3% in 2018 (Dinas Kesehatan Provinsi Jawa Timur, 2022). In 2020, the prevalence of

hypertension in East Java, especially in Malang City, ranked second with 35,641 cases (Dinas Kesehatan Kota Malang, 2021).

Previous research says that home pharmacy care affects patient compliance when taking medication and can also control patient blood pressure (Gibran et al., 2021). Likewise, research conducted at Puskesmas Gamping II shows that individuals with hypertension in community health centers can benefit from home pharmacy care explanations, and can reduce high systolic and diastolic values significantly (Utami et al., 2019). However, in practice, home pharmacy care is less applied by Indonesians because there are still obstacles, one of which is the lack of information on how to implement it. This observation is designed to see the effect of home pharmacy care on the level of knowledge and monitoring of systolic blood pressure in patients with hypertension.

RESEARCH METHODS

Tools And Materials

This research instrument uses Microsoft Excel to collect data, Statistical Product And Service Solutions (SPSS) software version 25 for data analysis, and a tensimeter to measure the blood pressure of hypertensive patients. The research material used a questionnaire to see the level of knowledge of hypertensive patients, as well as leaflet media to educate patients. This questionnaire consisted of 12 questions, namely the patient's knowledge about the use of drugs, the name of drugs that are consumed regularly, the dose, the timeliness of drug consumption, the method of use, the mechanism of the drug, the number of drugs consumed, the use of drugs regularly, the consequences if not compliant, drug interactions, the behavior that must be carried out if you miss taking the drug, and the rules for storing drug preparations. In this questionnaire, reliability and validity tests have been carried out, for our questionnaire validity data as follows: statement no 1 correlation value of 0.003; statement no 2 correlation value of 0.000; statement no 3 correlation value of 0.003; statement no 4 correlation value 0.000; statement no 5 correlation value 0.000; statement no 6 correlation value 0.000; statement no 7 correlation value 0.001; statement no 8 correlation value 0.004; statement no 9 correlation value 0.003; statement no 10 correlation value 0.000; statement no 11 correlation value 0.000; statement no 12 correlation value 0.000. The correlation value of all statements in the questionnaire has met the correlation value (sig. (2-tailed) < the significant level (α) of 0.05. So that all statements in the questionnaire can be declared valid. The reliability test value (Cronbach alpha) is 0.847. The questionnaire is declared reliable if the Cronbach alpha value obtained is greater than the alpha coefficient, namely 0.6.

Type of Research

This study is a quantitative experimental study using the Randomized Controlled Trial (RCT) method. RCT is a research design that involves randomizing research participants into two groups, an intervention group and a control group. By comparing the control group who did not receive home pharmacy care education and the intervention group who received the education, we can see the effect of providing home pharmacy care education.

Research Population and Sample

Hypertensive patients in the outpatient clinic of Kendalsari Health Center Malang were used as the population in the study. The sample size was measured using the Slovin formula with a known population of 50 patients with hypertension and obtained a sample size of 34 patients without comorbidities. The 34 patients were divided into 2 groups, namely, 17 respondents in the control group and 17 respondents in the test group. For sampling techniques use accidental sampling because it better describes the actual situation.

Research Procedure

1. In the intervention group on day 1: a). The researcher came to the patient's house, then introduced himself and explained the purpose and objectives of the study. b). Taking blood pressure measurements and reading the results. c). Giving questionnaires as a pretest. d). Providing Home pharmacy care education using leaflet media. The education provided includes the definition of hypertension, classification of hypertension, signs and symptoms of hypertension, causes of hypertension, complications of hypertension, prevention of complications of hypertension, schedule of taking medication and its dosage, tips for maintaining compliance with taking medication, explaining the benefits if the patient complies with taking medication, and the consequences if the patient is not compliant in taking medication. On day 7: a). The researcher returned to the patient's home. b). Measuring blood pressure and reading the results, explaining whether the blood pressure has improved or not. c). Giving a questionnaire as a posttest. d). Inform the patient that today is the last visit.
2. In the control group on day 1: a). The researcher came to the patient's house, then introduced himself and explained the purpose and objectives of the study. b). Taking blood pressure measurements and reading the results. c). Giving a questionnaire as a pretest. On day 7: a). The researcher returned to the patient's home. b). Take blood pressure measurements again and read the results. c). Giving questionnaires as a posttest. d). Inform the patient that today is the last visit.

Data Analysis

To see the effect of home pharmacy care on blood pressure control and knowledge level, data will be analyzed using paired T-Test and Pooled T-Test using SPSS. Paired T-Test testing is used to test the values obtained in each group. For pooled T-Test to see the effect and compare values between groups. If it is found that the data is not normally distributed, the analysis used is the Wilcoxon test. The hypothesis is accepted if the significance is <0.05 , then the hypothesis is rejected if the significance is >0.05 , while for the Wilcoxon test, the hypothesis is accepted if the significance is <0.05 and the hypothesis is rejected if the significance is >0.05 (Wardianto, 2023).

Research Ethics

This research has obtained ethical clearance in the Health Research Ethics Committee Institute Of Health Science Strada Indonesia with the number 3907/KEPK/VII/2023.

RESULTS AND DISCUSSION

Description of Respondent's characteristics

The results of the study of the effect of home pharmacy care education on blood pressure control and knowledge level of hypertensive patients at Puskesmas Kendalsari Malang are presented in the following table:

Table I. Characteristics of Respondents

Characteristics Of The Sample	Intervention Group		Control Group	
	N	%	N	%
Gender				
Male	5	29	1	6
Female	12	71	16	94
Age				
36-45 Years old	1	6	1	6
46-55 Years old	4	24	1	6
56-65 Years old	5	29	8	47
≥ 65 Years old	7	41	7	41
Education				
SD	1	6	10	59
SMP	5	29	4	23
SMA	9	53	3	18
Higher Education	2	12	0	0
Work				
Not Working	1	6	1	6
IRT	9	53	8	47
Self-employed	4	23	5	29
Private Employee	2	12	3	18
Advocate	1	6	0	0
Long Time Sick				
< 1 Year	2	12	1	1
1-10 Year	13	76	15	88
11- 20 Year	2	12	0	0
> 20 Year	0	0	1	6

Table I, based on gender, shows that the largest percentage in the control group is 16 respondents (94%) female, and in the test group is 12 respondents (71%) female. Previous research has shown that increased renin release, which can lead to increased blood pressure, occurs when the estrogen-to-androgen ratio decreases in older women (Utami et al., 2019). This is also supported by other studies which state that High-Density Lipoprotein (HDL) levels in the blood protect against cardiovascular disease in women because there is estrogen in women, but estrogen levels decrease during menopause, making women more susceptible to cardiovascular disease (Pramestutie & Silviana, 2016). Based on the age category, it shows that the largest percentage in the control group is at the age of 56-60 years as many as 8 respondents (47%) out of a total of 17 respondents. Whereas in the intervention group, the largest percentage was at the age of ≥ 65 years as many as 7 respondents (41%) out of a total of 17 respondents. Previous research shows that blood pressure rises with age, at the age of >60 years having blood pressure > 140/90 mmHg. That's because the impact of degeneration

on people whose age increases (Suciana et al., 2020). This is also supported by other studies which state that postmenopausal women, especially those over 56 years of age, face an increased risk of developing hypertension (Sundari & Bangsawan, 2015). Based on education, it shows that the largest percentage in the control group is the elementary level of 10 respondents (59%) from a total sample of 17 respondents. Meanwhile, for the intervention group, the largest percentage of high school education was 9 respondents (53%) from a total sample of 17 respondents. A study found that hypertension is strongly associated with education. The increased risk of hypertension in low-educated people is due to a lack of understanding, in contrast to someone with higher education who absorbs information more quickly (Mujahidah & Supadmi, 2023). According to another study, the knowledge of children with primary education and no schooling is lower than that of students with higher education (Sundari & Bangsawan, 2015).

Based on occupation, the majority of patients in the intervention group were housewives, 9 respondents (53%). In the control group, the largest percentage was housewives with 8 respondents (47%). In line with other studies, 76.5% of women at the Gang Aut Health Center in Bogor suffer from hypertension due to housewives being prone to stress (Andini et al., 2019). Other studies have also stated that because they are too busy with their homes and families to worry about their health, housewives are more prone to hypertension (Suseno, 2017). The distribution of patients based on the duration of hypertension showed that 15 patients (88%) of the total sample of 17 respondents belonged to the control group. This group includes patients with a diagnosis of hypertension between one and ten years. For the intervention group, the largest percentage was hypertensive patients for 1 - 10 years as many as 13 respondents (76%) of the total sample of 17 respondents. In line with other studies, which show that the longer a person suffers from hypertension, the greater the likelihood of anxiety levels (Yuniartika & Bima Murti, 2020).

Table II. Characteristics of Respondents Based on Blood Pressure

Blood Pressure	Intervention Group		Control Group	
	Day 1	Day 7	Day 1	Day 7
Controlled*	12 (71%)	14 (82%)	10 (59%)	7 (41%)
Uncontrolled*	5 (29%)	3 (18%)	7 (41%)	10 (59%)

* **Controlled blood pressure** of patients aged ≥ 60 years: $< 150/90$ mmHg. Patients < 60 years of age = $< 140/90$ mmHg. ** **Uncontrolled blood pressure** Patient age ≥ 60 years = $> 150/90$ mmHg. Age < 60 years = $> 140/90$ mmHg.

Based on **Table II**, the blood pressure picture of hypertensive patients at Puskesmas Kendalsari Malang, Five respondents (29%) did not experience controlled blood pressure on the first day, but most patients (sixteen out of seventeen people, or 94%) experienced an increase in the category of controlled blood pressure on the seventh day. As for controlled blood pressure on day 1 as many as 12 respondents (71%) and on day 7 as many as 16 respondents (94%). This study is also in line with previous research which states that 100% of patients had uncontrolled blood pressure at pretest, but at post-test this figure decreased to 86%. (Oktaviani et al., 2020). Uncontrolled blood pressure is caused by several factors including elderly, genes prone to hypertension, excess body fat, and inactivity. The convenience of fast food has led individuals to reduce their consumption of fresh produce and fiber, while the intake of processed foods that are high in salt, fat, sugar, and calories has increased (Andini et al., 2019). In other studies also stated that diet, exercise, knowledge,

family support and the role of health workers are aspects that affect blood pressure control (Hidayati L, 2018). Based on the above research, the researcher assumes that uncontrolled blood pressure can be caused in several ways such as irregular diet, non-compliance when taking medication, and an unhealthy lifestyle. So the researcher advised hypertensive respondents to regularly check themselves at the nearest health service to find out whether their blood pressure was controlled or not.

Table III. Characteristics of Respondents Based on Knowledge Level

Knowledge Level	Intervention Group		Control Group	
	Day 1	Day 7	Day 1	Day 7
Good \geq 76-100%	5 (29%)	17 (100%)	2 (12%)	3 (18%)
Fair 60 - 75%	9 (53%)	0	10 (59%)	10 (59%)
Less \leq 60%	3 (18%)	0	5 (29%)	4 (23%)

Based on Table III. Data on the level of knowledge of the intervention group on day 1 showed that 29% of respondents with good knowledge, 53% with sufficient knowledge, and 18% of respondents with low knowledge. On day 7, 17 respondents (100%) had a very good level of knowledge. In the control group on day 1, 2 respondents (12%) had good knowledge, 10 respondents (59%) with sufficient knowledge, as well as 5 people (29%) with poor knowledge. On day 7 respondents had good knowledge of 3 people (18%), sufficient understanding of 10 people (59%), and less understanding of 4 people (23%). This is in line with previous research which revealed that 48.7% of respondents did not know anything about hypertension, the lack of understanding of respondents is related to their ability to remember hypertension counseling information. Memory decreases with age, leading to significant errors in answering questionnaires (Utomo, 2017). On the other hand, some studies prove that people with higher education are better able to receive information about hypertension and tend to face problems with a calmer mind (Utaminigrum et al., 2017). Based on the research above, the researcher assumes that a person's lack of knowledge about hypertension is due to several things such as level of education and experience.

Table IV. Analysis of Home Pharmacy Care on Knowledge Level

Knowledge Level	Day 1			Day 7			N	p*
	Mean	SD	SE	Mean	SD	SE		
Intervention Group	34.8235	6.83955	1.65883	43.5882	3.16344	.76725	17	0,000
Control Group	31.2941	4.76661	1.15607	32.7059	5.54262	1.3442	17	0,093

Statistical Analysis: *Paired T-test

In Table IV, the analysis used to see the different values of home pharmacy care on the level of knowledge at the Puskesmas Kendalsari Malang is a paired sample T-test statistical test, which will look for differences in pretest and post-test in each group. Based on the paired T-Test in the control group before and after observation, the significance (2tailed) $p = 0.093$ which means $p > \alpha (0.05)$, so it is said that there is no significant difference in the level of knowledge between the control group before and after the research. It can be concluded that without the intervention of home pharmacy care the control group before and after is not

significantly different. The results of the paired T-Test for the intervention group at the time before and after the research was carried out obtained a large significance (2tailed) $p = 0.000$, meaning $p < \alpha (0.05)$, meaning that there was a significant difference in the level of knowledge between the intervention group before and after the research. It can be concluded that the intervention in the form of home pharmacy care for the intervention group before and after influence the level of knowledge of respondents. This statement is comparable to previous research on hypertension showing that learning the definition, symptoms, causes, and classification of hypertension and knowing which foods to avoid can have a significant impact on lowering blood pressure (Istiqomah et al., 2022).

Table V. Analysis of the Effect of Home Pharmacy Care on Knowledge Level

Knowledge Level	Intervention Group			Control Group			N	p**
	Mean	SD	SE	Mean	SD	SE		
Day 1	34.8235	6.83955	1.65883	31.2941	4.76661	1.15607	17	0,091
Day 7	43.5882	3.16344	.76725	32.7059	5.54262	1.34428	17	0,000

Statistical Analysis: ** Pooled T-test

Based on **Table V**, the analysis of the effect of providing home pharmacy care interventions on the level of knowledge was carried out with a pooled T-Test of the control group and the intervention group before and after the study. From the intervention group and control group before the study, the significance value (2tailed) $p = 0.091$, meaning that $p > \alpha (0.05)$, after comparing the increase in knowledge of the intervention group and the control group, it was concluded that there was no significant difference between the two groups. While in the intervention group as well as the control group after observation, the significance value (2tailed) $p = 0.000$, meaning $p < \alpha (0.05)$, meaning that there is a significant difference in this study that has increased the understanding of the control group as well as the test group. The intervention group may have gained more knowledge after day 1 due to the home pharmacy care they received. This is in line with other studies that say that home pharmacy care improves patient understanding of oral antihypertensive drugs. The lack of home pharmacy care instruction may also explain the lack of understanding of the control group patients (Illahi et al., 2019).

Table VI. Analysis of Home Pharmacy Care on Blood Pressure

Group		Mean	SD	SE	N	P*
Intervention group						
Blood pressure	Systolic day 1	144.06	11.568	2.806	17	0,026
	Systolic day 7	137.65	12.088	2.932	17	
	Diastolic day 1	81.8235	12.40078	3.00763	17	0,028
	Diastolic day 7	78.1176	11.09551	2.69106	17	
Control Group		Mean	SD	SE	N	p*
Blood pressure	Systolic day 1	149.06	15.766	3.824	17	0,514
	Systolic day 7	147.12	12.257	2.973	17	
	Diastolic day 1	81.000	11.74202	2.84786	17	0,093
	Diastolic day 7	79.000	10.03120	2.43292	17	

Statistical Analysis: *Paired T-test

The research analysis used to determine the different values of home pharmacy care on blood pressure control at Puskesmas Kendalsari Malang is a paired sample T-test statistical test shown in **Table VI**. Based on the paired T-Test by the control group before and after the study, the significance of systolic (2tailed) $p = 0.514$ and $p = 0.093$ for diastolic, which means $p > \alpha (0.05)$, so it is said that there is no significant difference in blood pressure control by the control group during the study. The significance value (2-tailed) $p=0.027$ of the intervention group before and after the study states that there is a significant difference in blood pressure control from the intervention group before and after the study $p=0.05$. This is in to previous research which states that in the treatment group patients there was a decrease in systolic blood pressure from 152 mmHg to 129 mmHg, while in the control group there was no significant decrease in blood pressure (Mujahidah & Supadmi, 2023).

Table VII. Analysis of the Effect of Home Pharmacy Care on Blood Pressure

Blood pressure		Intervention group			Control Group			N	p**
		Mean	SD	SE	Mean	SD	SE		
Day 1	Systolic	144.0588	11.56758	2.80555	149.0588	15.76575	3.682376	3	0,300
	Diastolic	82.00031	13.71131	3.66450	81.00035	10.80935	2.41704	3	0,818
Day 7	Systolic	137.647191	12.08791	2.93175	147.1176	12.25705	2.97277	3	0,030
	Diastolic	78.117651	11.09551	2.69106	79.0000	10.03120	2.43292	3	0,030

Statistical Analysis: ** Pooled T-test

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From **Table VII**, the results of the T-Test pooled difference test between the control group and the intervention group at posttest and pretest to determine the impact of home pharmacy care on blood pressure control. In the intervention group as well as the control group before the pretest, the systolic significance value (2tailed) $p = 0.300$ and $p = 0.818$ for diastolic which means $p > \alpha (0.05)$, so it is said that there is no significant difference in blood pressure control between the intervention group and the control group before the pretest. This is also consistent with research conducted at the Gamping Health Center that the possible reasons for not finding changes in blood pressure from the control group are patients feeling better without antihypertensive drugs and those who do not make lifestyle changes even though their blood pressure targets have been met (Chaerul et al., 2019). When hypertensive patients are told that their blood pressure is within normal values, they will stop taking the medication because they feel they don't need it anymore. After speaking with the study respondents, the researcher concluded that the best approach to hypertension is to keep blood pressure under control by taking hypertension medication regularly and adopting a healthy lifestyle. In the intervention group as well as the control group at posttest, the significance value $p = 0.030$ (2-tailed) for systolic blood pressure and diastolic $p = 0.05$. This means that there is a significant difference in blood pressure control. This study is in line with previous research where home pharmacy care provided by pharmacists has a positive effect on the compliance of the intervention group and can reduce the high systolic blood pressure as well as diastolic so that it can reach the optimal value of 140/90 mmHg (Damayanti et al., 2022). This is also supported by other studies that structured education can significantly reduce blood pressure and education can also be used as an intervention to control hypertension (Khomaini et al., 2017).

Home Pharmacy care provided is proven effective in increasing the level of knowledge and blood pressure control in hypertensive patients at Kendalsari Health Center Malang. Based on the Paired T-Test test in the control group there was no significant difference between day 1 and day 7. While in the intervention group there was a significant difference between day 1 and day 7. Likewise, the Pooled T-Test test on day 1 between the control group and the intervention group did not have a significant difference. While on day 7 between the control group and the intervention group there was a significant difference.

CONCLUSIONS

The conclusion drawn from this study is that home pharmacy care for hypertensive patients has a good effect on blood pressure control, and increases knowledge at Puskesmas Kendalsari Malang.

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