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The Effect of The Number of Drugs Received On The Level of Adherence to Drug Consumption (Morisky, Green, Levine Adherence Scale Questionnaire) of Hypertensive Patients

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ABSTRACT
Hypertension is a chronic disease that requires long-term treatment, where it is very prone to non-adherence in taking antihypertensive drugs. The prevalence of hypertension in Indonesia is increasing, where the results of the national population survey until 2018, it is known that the age ≥ of 18 years diagnosed by doctors is 34.1%. Monitoring of adherence and the factors that influence it are very important to achieve the success of antihypertensive therapy, namely controlled blood pressure. This study aims to determine the effect of the number of drugs received by patients on the level of adherence to the consumption of antihypertensive drugs. This research is a cross-sectional observational study that was conducted in 4 community health centers (Community Health Center) including Benowo Surabaya Health Center, Jeruk Surabaya Health Center, Tambak Rejo Health Center Surabaya, Gayungan Health Center. The measurement of adherence in this study used the Indonesian version of the MGLS questionnaire. The number of subjects in this study was 143 which fit the inclusion criteria. The majority of the adherence levels of the study subjects were moderate (MGLS questionnaire). Based on statistical analysis, it is known that there is a significant effect (P = 0.035) of the number of drugs received by patients on the level of drug consumption adherence e as measured using the Indonesian version of the MGLS questionnaire.

Keywords : Number of drugs, Adherence, MGLS, Antihypertensive drug

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BACKGROUND

Hypertension is a non-communicable disease which is currently increasing in prevalence. The prevalence of hypertension in Indonesia based on the results of a national population survey until 2018, it is known that the age ≥ of 18 years diagnosed by doctors is 34.1% (Riset Kesehatan Dasar, 2018). Data from the World Health Organization (WHO) in 2015 showed that around 1.13 billion people in the world suffer from hypertension, meaning that 1 in 3 people in the world is diagnosed with hypertension. The prevalence of hypertension is increasing in low and middle-income countries. This increase was mainly due to an increase in risk factors for hypertension in this population (WHO, 2019). Hypertension cannot be cured but controlled through routine health controls. Controlled systolic blood pressure can reduce the risk of death, cardiovascular disease, stroke, and heart failure (Ernawati et al., 2020; Burnier and Egan, 2019).

Factors that influence uncontrolled blood pressure include demographic characteristics, health beliefs, presence of chronic disease, and lack of knowledge about hypertension (Bochkareva et al., 2019). Another factor that affects the uncontrolled blood pressure is adherence to the consumption of antihypertensive drugs (Burnier, 2014). Monitoring adherence to antihypertensive drug consumption can assist patients in achieving therapeutic success. There are 2 methods to measure adherence, namely the direct method and the indirect method (Ernawati et al., 2018; Basu et al., 2019). The measurement of compliance in this study used an indirect method, namely using the Indonesian version of the MGLS questionnaire (Morisky, Green, Levine Adherence Scale) (Morisky et al., 1986; Ernawati and Islamiyah, 2019). The disease condition of hypertensive patients, where many complications can allow the patient to take more drugs so that it can increase the risk of reducing medication adherence due to too much drug quantity (Burnier and Egan, 2019). The purpose of this study was to determine the effect of the number of drugs received by patients on the level of adherence to antihypertensive drug consumption.

MATERIALS AND METHODS

Materials

This study uses MGLS Indonesian version questionnaire, Medical Records for Informed Consent, and Forms for Consent Patients.

Participant

Hypertensive patients who are on the diagnosis of hypertension and receiving antihypertensive drug therapy were enrolled for the current study (inclusion criteria)

Method

The type of this research is an observational cross-sectional study. This research was conducted in 4 Puskesmas (Community Health Centers) in several areas in Surabaya including Benowo Surabaya Health Center, Jeruk Surabaya Health Center, Tambak Rejo Health Center Surabaya, Gayungan Health Center. Prospective data collection was for 2 months in May-June 2020. The data collection method in this study was online or in the network by short messages, telephone, and Google Zoho forms. Prospective research subjects are given information by researchers related to research, the benefits, and willingness to participate in becoming a research subject before being willing to become a research subject. Retrieval of data using purposive sampling techniques. This study had obtained ethical merit from the ethics committee of the Faculty of Public Health at Airlangga University (No.81 / EA / KEPK / 2020).

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Inclusion Criteria

1. Patient (20-70) years of diagnosis of hypertension and receiving antihypertensive drug therapy.
2. Patients with complete data (medical records and prescription drugs).
3. Patients who visit the Community Health Center at least take antihypertensive drugs for 1 month.
4. Patients who are willing to be contacted via a WhatsApp or telephone or text message.

Exclusion Criteria

1. Patients with hypertension in children.
2. Patients in pregnant and nursing women who suffer from hypertension.
3. Patients with incomplete medical record data.
4. Patients with mental retardation.

Adherence Measurement

The level of compliance with the consumption of antihypertensive drugs in this study used the Indonesian version of the MGLS questionnaire which had been translated and tested for validation and reliability, with the results of 4 items of the Indonesian version of the MGLS question being valid and the reliability test results stated that they were reliable with a Cronbach alpha coefficient of 0.634 (Ernawati and Islamiyah, 2019). The use of the MGLS questionnaire has obtained permission from the original author Morisky et al (1986) to be translated into Indonesian. Score assessment using MGLS is done by adding up the values that answer yes and no, where if the research subject answers yes, it is worth 1, while the answer is not 0. The higher the MGLS score, the lower the level of adherence. The level of adherence using the MGLS questionnaire was divided into 3 levels based on the score obtained. Adherence is the low level if the MGLS score is 3 or 4. The level of adherence is moderate with the MGLS score of 1 or 2, then adherence is high when the MGLS score is 0 (Morisky et al., 1986).

Statistical Analysis

The normality of data distributions was verified using the Shapiro-Wilk and Lilliefors test. Qualitative and ordinal variables were grouped in contingency tables, with numbers (n) and percentage (%) calculated. Pearson's chi-squared test checks for differences in the proportion of a variable among the groups. Statistical analysis in this study using SPSS version 20 Software.

RESULTS

Patients Characteristic

This study is a study to see the effect of comorbid / comorbidities and the number of drugs received by patients (antihypertensive drugs and other drugs given by doctors) on the level of adherence to drug consumption. The hypertensive patients who were the subjects of this study were 143 patients consisting of 70.63% women and 29.37% men. The majority of study subjects were in the 41-60 years age range (53.15%) Table 1. Based on the results of the scores from the MGLS questionnaire, it is known that the majority of drug adherence levels are medium level (56.64%) with a score range of 1 or 2 (Table 1).

Table 1. Baseline Characteristic

Baseline Characteristic	Number (N Total= 143)	Percentage (%)
Gender		
Female	101	70.63
Male	42	29.37
Age		

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20-40 years	4	2.79
41-60 years	76	53.15
>60 years	63	44.05
Background education		
Elementary School	49	34.26
Junior High School	27	18.88
Senior High School	44	30.77
Diploma Degree	2	1.39
Bachelor and Master Degree	21	14.68
Adherence Level (MGLS Questionnaire)		
Low	14	9.79
Medium	81	56.64
High	48	33.56

MGLS, Morisky, Green, Levine Adherence Scale

Characteristic of Adherence based on MGLS (Morisky, Green, Levine Adherence Scale) questionnaire

The level of adherence in this study was measured using the Indonesian version of the MGLS questionnaire. The level of compliance using the MGLS questionnaire was divided into 3 levels of adherence (low, medium, and high) (Morisky et al., 1986; Beyhagi, et al. 2016). Based on Table 2, it is known that patient characteristics such as gender, age, education level, type of antihypertensive therapy, and the presence of comorbid do not effect on the level of adherence to drug consumption as measured using the MGLS questionnaire (P> 0.05) (Table 2).

Table 2. Adherence Level Characteristic (MGLS Questionnaire)

Qualitative Variable Characteristic	Adherence Level (Indonesian version of MGLS Questionnaire)			*P*-value
	Low N total = 14 (%)	Medium N total = 81 (%)	High N total = 48 (%)	
Gender				0.106
Female	11 (78.57)	51 (62.96)	39 (81.25)	
Male	3 (0.42)	30 (37.04)	9 (18.75)	
Age				0.531
20-40 years	1 (7.14)	1 (1.2)	2 (4.16)	
41-60 years	9 (64.28)	46 (56.79)	22 (45.83	
>60 years	6 (42.86)	34 (41.97)	24 (50)	
Background education				0.134
Elementary School	3 (21.43)	32 (39.5)	17 (35.41)	
Junior High School	5 (35.71)	14 (17.28)	7 (14.58)	
Senior High School	3 (21.43)	23 (28.39)	16 (33.33)	
Diploma Degree	0 (0)	1 (1.2)	1 (2.08)	
Bachelor and Master Degree	3 (21.43)	11 (13.58)	6 (12.5)	
Type of Therapy				0.283
Monotherapy	12 (85.71)	67 (82.71)	43 (89.58)	

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Combination	2 (14.28)	14 (17.28)	5 (10.41)	
Presence Comorbid				0.194
No Comorbid	13 (92.86)	59 (72.84)	34 (70.83)	
Comorbid	1 (7.14)	19 (23.45)	14 (29.17)	
Mean Adherence Score	3.5 (25)	1.50 (1.85)	0 (0)	
Number of Drugs receive				0.035
1	2 (14.28)	4 (4.93)	1 (2.08)	
2	1 (7.14)	15 (18.51)	10 (20.83)	
3	6 (42.86)	12 (14.81)	17 (35.41)	
4	3 (21.43)	35 (43.21)	12 (25)	
5	1 (7.14)	11 (13.58)	8 (16.67)	
>5	1 (7.14)	4 (4.93)	0 (0)	

DISCUSSION

Hypertension is defined as systolic blood pressure more than 140 mmHg and diastolic blood pressure ≥90 mmHg (Kearney et al., 2005; Burnier and Egan, 2019). Hypertension is a chronic disease that takes a long time and requires routine consumption of antihypertensive drugs, this is to prevent complications of cardiovascular disease (Burnier and Egan, 2019). Blood pressure control is very important to achieve therapeutic success. Adherence to the use of antihypertensive drugs in hypertensive patients is the extent to which a person's behavior using the medication is following with the agreed recommendations from the health care provider or a doctor's prescription. In hypertensive conditions lower levels of adherence are associated with poorer blood pressure control and adverse outcomes, including stroke, myocardial infarction, heart failure, and death (Kroussel Wood et. Al., 2015; Peacock et al., 2017).

Monitoring the level of adherence is one of the things that must be done by health workers to evaluate a patient's treatment. Based on the results of a review by Peacock et al., (2017), it is known that the average level of adherence to drug consumption in chronic disease treatment is only around 50%. Based on Table 1, it is known that the majority of adherence levels in this study are the moderate or medium level of adherence with a MGLS questionnaire score of 1 or 2. Analysis of the 4 items of the MGLS questionnaire, it is known that the majority of patients do not comply with drug consumption because they forget to take medication (question item 1) and stop take medication when the patient feels better (question item 3). This is the reason for the majority of the adherence level of drug consumption is medium.

Factors that influence non-adherence in drug consumption, especially antihypertensive drugs, include factors from the patient (patient psychology or behavior), patient conditions, socioeconomic and environmental factors (Burnier and Egan, 2019). This study was to determine whether there is an effect of the number of drugs received by patients on the level of adherence to antihypertensive drug consumption. The results of the study in Table 2 show that there is no statistically significant effect of gender, age, level of education, and the presence or absence of comorbid (P> 0.05). These results differ from previous studies by Choi et al. (2018) stated that aged> 50 years had a high level of adherence to the consumption of antihypertensive drugs. This is because older age is associated with better treatment adherence among hypertensive patients due to perceived susceptibility and disease severity (Kamran et al., 2014; Bandi et al., 2017). Educational background factors in this study did not have a significant effect on the level of adherence.

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The results of this study are not the same as research from Tilea et al (2018), it is known that a higher level of education increases the level of adherence.

The results of the statistical analysis of the effect of the number of drugs received by patients on the level of adherence were known to have a significant effect (P = 0.035) (Table 2). This means that the number of drugs received by patients has a significant effect on the level of adherence. The characteristics of the therapeutic regimen or the drug itself can affect adherence (Burnier and Egan, 2019). Another study by Etebani et al (2019) found that a smaller number of drugs had a better level of adherence than patients who received a large number of drugs. Simple dosing regimens such as once daily and adjusted to the patient's routine schedule are known to improve adherence. The number of drugs that are less or can be implemented using a single drug once a day or a fixed-dose is consistently associated with better hypertension adherence and control (Egan et al., 2012). Complex therapeutic regimens with multiple drugs, especially when using multiple daily doses can be a barrier to adherence (Hill et al, 2011; Burnier, 2017).

The weakness of this study is that there has not been an in-depth analysis of the factors that influence adherence including factors from within the patient, health system, and socioeconomics using other instruments. Based on the results of this study, further research can be developed to find other factors that affect the level of adherence to the consumption of antihypertensive drugs.

CONCLUSION

Based on the results of this study, it can be concluded that the compliance level of the majority of hypertensive patients as measured using the Indonesian version of the MGLS questionnaire from 4 Puskesmas (Community Health Centers) in several areas in Surabaya including Benowo Surabaya Health Center, Jeruk Surabaya Health Center, Tambak Rejo Health Center Surabaya, Gayungan Health Center is a moderate level of adherence (score 1 or 2). The results of statistical analysis showed that the number of drugs received by patients from doctors which included antihypertensive drugs and other drugs received by patients based on the symptoms suffered by the patient had a statistically significant effect on the level of adherence to the consumption of antihypertensive drugs.

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