

Relationship between Knowledge and Compliance Using Anti-dyslipidemic Drugs among Hypertensive Patients with Dyslipidemia in Bandung, West Java, Indonesia

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Abstract

Background: Dyslipidemia occurs in 60% of hypertensive patients. Effective treatment of hypertensive patients with dyslipidemia can reduce the risk of cardiovascular disease by more than 50%. However, compliance with dyslipidemia medication in dyslipidemia patients is still low. Low compliance can be attributed to poor knowledge. This study aimed to analyze the relationship between knowledge and compliance using antidyslipidemic drugs in hypertensive patients with dyslipidemia.

Methods: A cross-sectional analytical study was conducted from August to September 2022 at the Pasirkaliki Public Health Center (*Pusat Kesehatan Masyarakat*, Puskesmas), Bandung, Indonesia. The consecutive sampling method was used to collect 64 hypertensive patients with dyslipidemia who were taking anti-dyslipidemic drugs. Primary data on knowledge and compliance were obtained through valid and reliable questionnaires. The Chi-square test was used to determine the relationship between the two variables.

Results: The study results showed that 95.3% of respondents had good knowledge. Respondent compliance showed obedience of 78.1%. Respondents with good knowledge had an obedience rate of 78.1%. There was a relationship between knowledge and compliance to using anti-dyslipidemic drugs in hypertensive patients with dyslipidemia ($p=0.001$).

Conclusion: There is a relationship between knowledge and compliance with the use of anti-dyslipidemia drugs in hypertensive patients with dyslipidemia. Almost all patients have good knowledge. Continuous maintenance and improvement of patient knowledge is required, which can be achieved by conducting health education to better understand the relationship between diseases and the importance of taking medication.

Keywords: Compliance, dyslipidemia, hypertension, knowledge

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Introduction

Hypertension is a disorder of the systemic arteries that causes a persistent increase in blood pressure above normal values.¹ The World Health Organization (WHO) in 2021 estimates that there are 1,28 billion hypertensive people in the world.² Data from the 2018 Basic Health Research also found that around 658,201 (34.1%) of the entire population of Indonesia had hypertension.³ One of the primary risk factors for hypertension

is dyslipidemia.⁴ A study conducted in Nigeria in 2020 found that dyslipidemia has a high prevalence in hypertensive patients, with 60% of hypertensive patients having dyslipidemia.⁵

Hypertensive patients with dyslipidemia had an 18.1 times greater risk of acquiring coronary heart disease (CHD) than non-dyslipidemic.⁶ The presence of hypertension and dyslipidemia in the same person increases the risk of cardiovascular disease (CVD) and all-cause mortality compared with patients with only hypertension.⁷ Effective treatment for

hypertensive patients with dyslipidemia would reduce the risk of cardiovascular disease (CVD) by > 50%.⁸ Ironically, only 9% of hypertensive patients with dyslipidemia are on treatment and under control.⁹ Treatment effectiveness depends on medication compliance.¹⁰ In 2014, the National Lipid Association showed that more than 50% of patients with dyslipidemia did not continue their treatment within one year.¹¹ Poor patient compliance to treatment is a major contributor to dyslipidemia treatment failure.¹²

One of the factors that significantly influences medication compliance is knowledge.¹³ This knowledge includes an understanding of the causes and symptoms of the disease as well as the consequences of not taking medication properly.¹⁴ Several studies have shown a relationship between knowledge and compliance with anti-dyslipidemic drug consumption in dyslipidemic patients.^{12,15} However, up to this point, study results regarding this relationship are generally not specific to the disease of hypertensive patients only. It might be due to the limited studies on the relationship between knowledge and compliance to anti-dyslipidemic drugs, which focus on hypertensive patients with dyslipidemia, and the fact that no previous study had specifically examined this relationship in Indonesia. Therefore, this study aimed to investigate the relationship between knowledge and compliance using anti-dyslipidemic drugs in hypertensive patients with dyslipidemia.

Methods

This analytic observational study with a cross-sectional approach was conducted from August to September 2022 at Puskesmas Pasirkaliki, Cicendo Village, Bandung, Indonesia. A consecutive sampling method was carried out on hypertensive patients aged 18–70 years old with dyslipidemia who were taking anti-dyslipidemic drugs. The inclusion criteria were patients who could read, write, and communicate well. Exclusion criteria were respondents who were not willing to participate in the study by not signing the informed consent form. This study obtained ethical clearance from the Research Ethics Committee of Universitas Padjadjaran with number 697/UN6.KEP/EC/2022.

Data was collected, including sociodemographic data on gender, age, occupation, marital status, educational level, duration of hypertension, and current use of

anti-dyslipidemic drugs.

The knowledge questionnaire measured nine items of respondent knowledge: the definition of hypertension, the definition of dyslipidemia, the effect of dyslipidemia as a risk factor for hypertension, signs and symptoms, complications, diet pattern, the goal of treatment therapy using anti-dyslipidemic drugs in hypertension, rules for using anti-dyslipidemic drugs, and side effects as well as interactions of anti-dyslipidemic drugs with other drugs or food. There was a total of 12 statements in this questionnaire; each statement was answered as true or false, and each correct answer got a score of 1, and an incorrect answer got a score of 0. The maximum score from this questionnaire was 12, and a score above or equal to 6 indicated good knowledge, whereas below 6 meant poor knowledge.

The compliance questionnaire measured six items of respondent compliance: elements of forgetfulness and discipline in taking medication, elements of intentional stopping, ability to control oneself in taking medication, disruption of medication taking schedule, drug effectiveness, and drug side effects. There was a total of 6 questions in this questionnaire; each question was answered with yes or no answers, and each correct answer got a score of 1, and an incorrect answer got a score of 0. The maximum score on this questionnaire was six, and a score above or equal to 3 indicated obedience, while below three implied disobedience.

The questionnaires about knowledge and compliance were then tested, and valid and reliable results were obtained, with Cronbach's alpha scores for knowledge and compliance being 0.806 and 0.724, respectively.

The chi-square test was used to analyze the data collected statistically using IBM Software Statistical Product and Service Solution (SPSS) version 25. The result showed a significant relationship between the variables tested if the p-value was <0.05.

Results

The majority of respondents were female (81.3%), and most of them (40.6%) were in the senior age group. The overall educational level was in senior high school (29.7%), and 25% of them were college graduates. Most respondents were housewives (51.6%), married (93.8%), and had hypertension for more than five years (68.8%). The anti-dyslipidemic drug currently most commonly used by respondents were

Table 1 General Characteristics of Study Population

Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	12	18.8
Female	52	81.3
Age (years)		
Late adult (36–45)	1	1.6
Early elderly (46–55)	12	18.8
Late elderly (56–65)	25	39.1
Senior (66–70)	26	40.6
Educational level		
No education	1	1.6
Elementary school	13	20.3
Junior high school	15	23.4
Senior high school	19	29.7
College graduate	16	25
Occupation		
Unemployed/retired	19	29.7
Traders	3	4.7
Labor	1	1.6
Entrepreneur	2	3.1
Housewife	33	51.6
Civil servant	6	9.4
Marital status		
Not yet married	2	3.1
Married	60	93.8
Widow	2	3.1
Duration of hypertension		
<5 years	20	31.3
>5 years	44	68.8
Current use of anti-dyslipidemic drugs		
Simvastatin	59	92.2
Atorvastatin	5	7.8

simvastatin (92.2%) (Table 1).

Respondents' knowledge about the definition of hypertension was classified as the highest (98.4%), while knowledge about the rules for using anti-dyslipidemic drugs was rated as the lowest, with only 10.9% of respondents knowing that the consumption of anti-dyslipidemic drugs could not just be stopped because they no longer felt symptoms of dyslipidemia (Table 2).

Compliance was assessed as the lowest indicator of the ability to control oneself to take medication, where only 26.6% of respondents continued treatment with a doctor/health worker even though they no longer felt symptoms of the disease (Table 3).

In terms of knowledge, the majority of respondents had good (95.3%) knowledge, and only 4.7% of them had poor knowledge.

Compliance among respondents was generally obedient (78.1%), with only 21.9% of them being disobedient (Table 4). Of all respondents who had good knowledge, there were 26 (100%) senior-age respondents, 19 (100%) high school graduates, 31 (93.9%) were housewives, and the majority (97.7%) who had hypertension for more than five years. Of all obedient respondents, 21 people (80.8%) were of senior age, 15 (78.9%) were high school graduates, 25 (75.8%) were housewives, and the majority (75%) experienced hypertension for more than five years (Table 5).

There was a relationship between knowledge and compliance with the use of anti-dyslipidemic drugs in hypertensive patients with dyslipidemia at the Pasirkaliki Public Health Center ($p=0.001$) as shown in Table 6.

Table 2 Knowledge Assessment through Questionnaire

No	Indicator	Questionnaire Item	Correct Answer n(%)
1	Definition of hypertension	Hypertension is also known as high blood pressure	63(98.4)
2	Definition of dyslipidemia	Dyslipidemia is a condition when the level of fat in the blood exceeds normal levels	49(76.6)
3	Effect of dyslipidemia as a risk factor for hypertension	High blood cholesterol levels can increase the risk of high blood pressure	61(95.3)
4	Sign and symptoms	Hypertension can occur without any symptoms	44(68.8)
		Most patients with dyslipidemia are asymptomatic	25(39.1)
5	Complications	Untreated high blood pressure with dyslipidemia can lead to heart disease	61(95.3)
6	Diet pattern	Foods that are high in fat (e.g., fast food, fried foods, etc.) are not good for patients with high blood pressure	61(95.3)
7	The goal of treatment therapy using anti-dyslipidemic drugs in hypertension	Cholesterol-lowering drugs used can reduce the risk of high blood pressure	46(71.9)
8	Rules for the use of anti-dyslipidemic drugs	Therapy to lower cholesterol levels requires long- period	35(54.7)
		Consumption of cholesterol-lowering drugs can be stopped if the symptoms improve	7(10.9)
		Cholesterol-lowering drugs will work more effectively if taken at night	56(87.5)
9	Side effects, as well as interactions of anti-dyslipidemic drugs with other drugs or food	There is no health benefit if cholesterol-lowering drugs are taken at the same time as blood pressure-lowering drugs	30(46.9)

Discussion

This study has shown a good level of knowledge among respondents with hypertension (95.3%). Knowledge is the result of knowing after an individual senses a certain object. One of the profound internal factors that affect individual knowledge is the level of education,¹⁶ as seen from the education of respondents in our study which was senior high school graduates (29.7%) and college graduates (25%). The higher the education, the easier the person to receive information, and the longer the person has been in education, the better the level of knowledge.¹⁶

Moreover, high level of knowledge among senior age group has been found, suggesting that advanced age has influenced the advanced understandings. Individual's perspective, thinking, and learning capacity evolve as they age, which in turn contributes to increased knowledge.¹⁷

Interestingly, there are respondents who do not have an occupation; whether they are unemployed or retired and housewives, but have good knowledge. Good knowledge in these groups might be due to plenty of spare time they have to explore the topics using various media, including magazines, newspapers, television, radio, and the internet. In addition, respondents who do not work are more likely to attend counseling with healthcare professionals, so they have better knowledge of the disease than those who work.¹⁸

In addition, this study also shows that respondents with a high level of knowledge were dominated by those who had hypertension for more than five years (97.7%), indicating that the duration of experiencing a disease might affect the level of knowledge about the disease. The longer a person suffers from an illness, the more experience they have and the more knowledge they gain from those experiences.¹⁴

Table 3 Compliance Assessment through Questionnaire

No	Indicators	Questionnaire Item	Yes, n (%)
1	Elements of forgetfulness and discipline to take medicine	Do you always take cholesterol-lowering drugs regularly (for example, every day) as recommended by the doctor/nurse at the treatment center?	43(67.2)
2	Element of intentional stopping	Have you ever intentionally stopped taking the drug because you felt too lazy to take it?	20(31.3)
3	Ability to control oneself to take medicine	Do you continue to take the medicine given by the doctor/health worker even though you do not feel the symptoms of the illness?	17(26.6)
4	Disrupted taking medication schedule	Do you feel bored or disturbed by the regular schedule of taking drugs?	29(45.3)
5	Drug effectiveness	Have you ever stopped using the drug because you felt it was not beneficial to your health?	13(20.3)
6	Drug side effects	Have you ever stopped taking the medicine for fear that one day it could damage your kidneys or liver?	16(25)

Table 4 Knowledge and Compliance of Hypertensive Patients with Dyslipidemia at Pasirkaliki Public Health Center (n=64)

Variable	Category	Frequency (n)	Percentage (%)
Knowledge	Good	61	95.3
	Poor	3	4.7
Compliance	Obedient	50	78.1
	Disobedient	14	21.9

This study found a high level of obedience (78.1%) to anti-dyslipidemic drug medication. Patients with hypertension correlate with better compliance to statin.¹⁹ Compliance is defined as the understanding and agreement resulting from the patient's plan and the consequences of interactions between health workers and patients. Compliance is a key factor for all pharmacology therapies that are associated with patient morbidity and mortality.²⁰ Factors related to compliance with medication use are patient-related factors, physician-related factors, and health system-related factors. Among these factors, patient-related factors have the greatest influence on patient compliance in using anti-dyslipidemic drugs. The knowledge aspect dominates the factors related to compliance with the use of anti-dyslipidemic drugs in patients.^{15,20,21}

Although high rate of obedience has been shown in this study, there is low number of correct answers (10.9%) obtained by

respondents regarding the rules for taking anti-dyslipidemic drugs occurred when the signs and symptoms had improved, reflecting the low number of patients who continued to undergo dyslipidemia treatment (26.6%). This indicates a relationship between knowledge and compliance using anti-dyslipidemic drugs in hypertensive patients with dyslipidemia at the Pasirkaliki Public Health Center (p=0.001).

Study by American Heart Association in 2019 has revealed that knowledge and compliance with the use of anti-dyslipidemic drugs had a significant relationship among participants who had hypertension as one of the clinical characteristics of the study.²² This finding is also supported by a study that included patients with a variety of cardiovascular disease histories, such as hypertension, and discovered that these patients have better compliance due to their awareness of the risk of heart disease, which is one of the indicators of patient knowledge.¹⁹

Table 5 Distribution of Respondent Characteristics Relationship with Knowledge and Compliance

Characteristics	Knowledge, n(%)		Compliance, n(%)		Total, n(%)
	Good	Poor	Obedient	Disobedient	
Gender					
Male	12 (100)	0(0)	10(83.3)	2(16.7)	12(100)
Female	49 (94.2)	3(5.8)	40(76.9)	12(23.1)	52(100)
Age (years)					
Late adult (36–45)	1(100)	0(0)	1(100)	0(0)	1(100)
Early elderly (46–55)	10(83.3)	2(16.7)	8(66.7)	4(33.3)	12(100)
Late elderly (56–65)	24(96)	1(4)	20(80)	5(20)	25(100)
Senior (66–70)	26(100)	0(0)	21(80.8)	5(19.2)	26(100)
Educational level					
No education	1(100)	0(0)	1(100)	0(0)	1(100)
Elementary school	12(92.3)	1(7.7)	9(69.2)	4(30.8)	13(100)
Junior high school	14(93.3)	1(6.7)	13(86.7)	2(13.3)	15(100)
Senior high school	19(100)	0(0)	15(78.9)	4(21.1)	19(100)
College graduate	15(93.8)	1(6.3)	12(75)	4(25)	16(100)
Occupation					
Unemployed/retired	19(100)	0(0)	17(89.5)	2(10.5)	19(100)
Traders	3(100)	0(0)	2(66.7)	1(33.3)	3(100)
Labor	1(100)	0(0)	1(100)	0(0)	1(100)
Entrepreneur	2(100)	0(0)	1(50)	1(50)	2(100)
Housewife	31(93.9)	2(6.1)	25(75.8)	8(24.2)	33(100)
Civil servant	5(83.3)	1(16.7)	4(66.7)	2(33.3)	6(100)
Marital status					
Not yet married	2(100)	0(0)	2(100)	0(0)	2(100)
Married	57(95)	3(5)	46(76.7)	14(23.3)	60(100)
Widow	2(100)	0(0)	2(100)	0(0)	2(100)
Duration of hypertension					
<5 years	18(90)	2(10)	17(85)	3(15)	20(100)
>5 years	43(97.7)	1(2.3)	33(75)	11(25)	44(100)
Current use of anti-dyslipidemic drugs					
Simvastatin	56(94.9)	3(5.1)	45(76.3)	14(23.7)	59(100)
Atorvastatin	5(100)	0(0)	5(100)	0(0)	5(100)

This study is in line with the behavioral theory, which conveys predisposing factors such as knowledge as a significant determining factor in a person’s health behavior, which in this case is compliance with the use of anti-dyslipidemic drugs in hypertensive patients

with dyslipidemia.¹⁶ This positive relationship will lead to effective treatment for hypertensive patients with dyslipidemia so that it can reduce the risk of advanced diseases.

Limitations of this study include the risk of recall bias. Several respondents mentioned

Table 6 Relationship between Knowledge and Compliance Using Anti-dyslipidemic Drugs in Hypertensive Patients with Dyslipidemia at Pasirkaliki Public Health Center

Knowledge	Compliance				Total		p-value
	Obedient		Disobedient		n	%	
	n	%	n	%			
Good	50	78.1	11	17.2	61	95.3	0.001
Poor	0	0	3	4.7	3	4.7	
Total	50	78.1	14	21.9	64	100	

that they had difficulty remembering their anti-dyslipidemic drug-taking habits. This study only discussed the relationship of compliance to a variable associated with patient-related factors. Considering that there are not many studies that discuss the relationships of compliance to anti-dyslipidemic drugs among hypertensive patients with dyslipidemia, further studies are needed to explore the association with other factors, such as physician-related and health system-related factors, in order to obtain a complete picture of this relationship, which will help in the assessment and management of compliance to anti-dyslipidemic drugs in hypertensive patients with dyslipidemia.

In conclusion, there is a relationship between knowledge and compliance with the use of anti-dyslipidemic drugs in hypertensive patients with dyslipidemia at the Pasirkaliki Public Health Center. It is necessary to continuously maintain and increase patient knowledge, especially the rules for using anti-dyslipidemic drugs, which can be carried out by providing health education to hypertensive patients with dyslipidemia at Puskesmas Pasirkaliki to understand better the relationship between disease and the importance of taking medication.

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