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## Research Article

# Factors Affecting Medical Adherence in Patients with Coronary Heart Disease

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### Abstract

**Aims:** The problems with Coronary Heart Disease (CHD) is non-adherence to taking medication which results in further complications. Only 80% of patients with chronic diseases living in developed countries follow treatment recommendations in taking medication. The factors that influence the previous research are knowledge, attitudes, and family support. However, in this study, there were different factors examined, namely age, gender, last education level, length of illness, and self-efficacy.

**Objective:** This study aimed to determine the factors that influence medication adherence in patients with coronary heart disease (CHD).

**Method:** this type of research is quantitative with a cross-sectional study approach. The population in this study were all patients with coronary heart disease who came for routine checkups at the Cardiac Polyclinic of RSAU Dr. M. Salamun Bandung with a sample of 67 people, with a convenience sampling technique. Data collection techniques used the Demographic Characteristics questionnaire, MMAS-8, PSS-Fa, and CSE.

**Results:** In this study, there were significant results between age (0.000), suffering from an illness (0.004), self-efficacy (0.001), and family support (0.029) with medication adherence in patients with coronary heart disease.

**Conclusion:** It can be concluded that the factors that have the most influence are the burden of suffering from the disease and those that do not affect adherence to taking medication in CHD patients, namely gender, and the last level of education.

### Keywords:

Factors, medicine adherence, CHD

## INTRODUCTION

Coronary Heart Disease (CHD) is when blood does not flow properly to the heart due to problems in the coronary arteries. This condition occurs because the coronary arteries that supply oxygen-rich blood to the heart muscle can narrow due to the buildup of cholesterol, fat, and other substances (plaque), which can cause atherosclerosis (1). CHD is the leading

cause of death from non-communicable diseases worldwide. The main cause of death in cases of CHD in the world reaches 75%, caused by consuming alcohol, hyperglycemia (high blood sugar), tobacco use (smoking), hypertension, obesity, increased cholesterol, lack of fruit and vegetable intake, and lack of exercise(2).

Data in 2018, deaths from cardiovascular disease were 217.1 per 100,000 people.

Usually, someone dies of cardiovascular disease every 36 seconds in the United States(3). Information from the Indonesian Ministry of Health in 2019 shows that heart and blood vessel disease incidence is increasing yearly. In Indonesia, at least 15 out of 1,000 people experience cardiovascular disease. The prevalence of heart disease based on medical diagnosis in Indonesia has reached 1.5%, and the highest prevalence is in North Kalimantan, as much as 2.2%, DIY at 2%, and Gorontalo at 2%. In addition, the prevalence is no less high in West Java, namely 1.6% (P2PTM RI Ministry of Health, 2019).

CHD cannot be cured, but it must always be controlled so that no adherences worsen the condition. Pharmacological treatments for CHD include nitrates, aspirin, beta-blockers or beta-blockers, and calcium antagonists. These drugs must be taken regularly, while non-pharmacological treatments for CHD include smoking cessation, reducing or stopping consuming alcoholic beverages, controlling blood sugar, diet (changes in eating patterns), and exercising regularly. CHD treatment aims not only to reduce or eliminate complaints (5).

One of the problems with CHD is nonadherence to medication, which results in further complications. The prevalence of drug nonadherence in CHD patients shows that as many as 187 million people do not comply with prescribed drugs (6). In Indonesia, adherence to medication in patients with CHD is still very concerning; the level of adherence to medication for people with heart disease is relatively low, with as many as 31 respondents. Only 25 respondents (80.6%) are compliant with taking medication.(7).

Treatment compliance is the level of motivation and the extent to which the patient tries and acts to comply with orders, rules, or advice from a doctor or other medical professional to help the patient recover (8). Medication adherence is still a common problem in the health sector. The

National Institute for Health and Care Excellence (NICE) classifies drug nonadherence into intentional and unintentional categories. In intentional nonadherence to treatment, the patient consciously chooses not to follow the treatment given due to beliefs and perceptions, skips taking medication to prevent side effects, or remembers the cost of treatment. It is proven that half of the problems of nonadherence to taking medication are intentional(9). More than 50% of parents live with various chronic diseases. Therefore, compliance is crucial to improving their health and quality of life. Nonadherence is characterized by patients who fail to follow the prescribed treatment and agree with the doctor regarding the time, dose, and frequency(10). This case is a serious problem common in people with chronic diseases such as hypertension, heart disease, diabetes mellitus (DM), pulmonary TB, and other chronic diseases.(11).

Factors that can increase the likelihood of someone complying with medication in patients with CHD include family support(5). Reinforced by Green's theory (1980) that medication adherence has three factors, namely predisposing factors (attitudes, knowledge, beliefs, values, beliefs, and perceptions). It is supporting or driving factors (health facilities and availability of facilities, ease of reaching health facilities, ease of transportation, and service time) and, lastly, reinforcing factors (support from family, friends, teachers, and health care providers)(12). In this condition, the presence of the family is needed to support CHD patients in carrying out their treatment. The factors that will affect the patient's consistency in taking the drug. Family support is crucial for social assistance that can be given to family members in focus and further developing their health status(5).

Self-efficacy is important in everyday life, especially in the health sector. In maintaining individual behavior to reduce

risk factors for CHD, self-efficacy is needed to encourage the patient's self-control process. Patients with good management self-efficacy must maintain health behavior in a good range and can make choices and goals, overcome problems, and reduce risk factors that cause CHD.(13). There is a significant significance between self-efficacy and medication adherence. People with high self-efficacy tend to be more compliant with CHD treatment or medication, possibly because they feel confident coping with challenges.(14).

In previous studies, some factors influenced adherence to taking medication in CHD patients, namely knowledge (p-value 0.039), attitude (p-value 0.012), and family support (p-value = 0.010) (Deswari, 2021). Research on the factors of adherence to taking medication, especially in patients with CHD in Indonesia, is still rarely carried out, mostly regarding adherence to taking medication in patients with hypertension and diabetes mellitus. Even though patients with coronary heart disease must also adhere to taking medication to prevent complications and recurrence. Therefore the researcher aims to identify other factors that influence medication adherence in CHD patients that have not been studied, namely age, gender, last level of education, length of illness, self-efficacy, and family support. Factors that have not been studied in previous studies are age, gender, last education level, duration of illness and self-efficacy.

## METHODS

This research uses a quantitative descriptive approach with a Cross-Sectional Study. The dependent variable in this study was medication adherence in patients with CHD. The independent variables were age, gender, last education level, length of illness, self-efficacy, and family support.

### Population and Research Sample

This study's population was CHD patients undergoing outpatient care at the RSAU Dr.

M. Salamun Bandung. Research conducted in July 2022 was conducted using a convenience sampling technique. Sample measurement estimates were calculated using G-Power software version 3.1.9.4 using F test, multiple linear regression: fixed model, R2 deviation from zero, effect size 0.35,  $\alpha$  0.05, power 0.95, and several predictors 6, with a minimum sample estimate of 67 respondents. The inclusion criteria were *compos mentis*, doing the outpatient treatment. Exclusion criteria are respondents who are taking treatment for the first time.

### Data Collection Tools

1. Respondent characteristic data checklist sheet  
The questionnaire contains the respondent's name/initials, age, gender, last education, and length of illness.
2. Self-efficacy questionnaire (Cardiac Self-Efficacy)  
The measuring tool for this instrument uses the Cardiac Self-Efficacy (CSE) questionnaire developed by(15), which has been translated and modified into the Indonesian version by Wantiyah (2010). The CSE questionnaire consists of statements containing risk factor management and function maintenance. After testing the validity and reliability, the results were obtained (0.77) using Cronbach alpha(16). The Cardiac Self-Efficacy Questionnaire (CSE) consists of 20 statement items with a Likert scale of 1-4, namely: 1 "not sure," 2 "not sure," 3 "sure," and 4 "very sure," the higher the score, the higher the level of self-efficacy. The calculation of the total score obtained is divided into three: low, medium and high (Wantiyah, 2010).
3. Family Support Questionnaire  
The measuring tool for this instrument uses the Perceived Social Support from Family (PSS-Fa) questionnaire designed by Procidano and Heller (1983) to measure the extent to which a person receives or obtains information, support, and feedback from the family specifically.

In the validity test, the results were obtained (0.361) from the reliability value (0.787); the test results stated that the 20 question items in the questionnaire had meaning or were valid. The PSS-Fa consists of 20 family support questions translated back into Indonesian. The value of each answer in the family support variable is divided into "yes," "no," and "do not know." Each indicator has favorable and unfavorable values (Priastana, IKA, Haryanto, J., 2018).

4. Medication Adherence Questionnaire  
Compliance with CHD medication was measured using data from the Morisky Medication Adherence Scale Questionnaire (MMAS-8). Morisky published the latest version in 2008, namely MMAS-8, with a higher reliability of 0.83 and higher sensitivity and specificity. This questionnaire contains questions about how often patients forget to take their medication, how often they deliberately stop taking it without the doctor's knowledge, and the patient's ability to continue. When measuring the score of the MMAS questionnaire with 8 question items using a Likert scale, numbers 1-7 score one if you answer "yes" except for question number 5, score 0 if you answer "yes," meanwhile question number 8 if you answer "never or rarely" is worth 0, (18).

### Data Collection Procedures

The research begins with the researcher taking care of all the necessary permits; then, the researcher conducts an ethical test at RSAU Dr. M. Salamun with number ethical : 13/606/VI/2022. The researcher selected the respondents according to the inclusion criteria. The researcher explained the purpose, research time, and the respondents' rights. If the respondent is willing, the respondent is asked to sign an informed consent form as proof of the statement that the respondent agrees to participate in the research. Respondents filled out a questionnaire that contained age, gender, last education level, length of illness, self-efficacy, family support, and medication adherence. The questionnaire was returned to the researcher if all questions had been answered. After all the data was collected, the researcher conducted data analysis.

### Data analysis

Data were analyzed using the IBM SPSS application version 24. The normality test results using the Kolmogorov-Smirnov Test show that all variables are normally distributed. Univariate analysis in a frequency distribution, percentage (%), mean, median, minimum, and maximum of each characteristic. Bivariate analysis was performed using an Independent sample t-test, Pearson Correlation, and One-way ANOVA. Multivariate analysis was performed using Linear Regression.

## RESULTS

The research results were analyzed in univariate, bivariate, and multivariate. Data presentation is made in tables and narratives. as follows:

**Table 1. Frequency Distribution of Respondents by Gender, Age, Education Level, and Length of Suffering from Disease in Patients with Heart Failure (N=67)**

Variable	total n (%)	Min-Max
Age (Mean ± SD)	61.43 ± 13.540	29 years – 89 years
<b>Gender</b>		
Man	37 (55.2%)	
Woman	30 (44.8%)	

<b>Level of education</b>	
No school	0 (0%)
Elementary School	22 (32.9%)
Junior High School	7 (10.4%)
Senior High School	27 (40.3%)
College	11 (16.4%)
<b>Length of CHD</b>	
< 1 year	6 (9.0%)
1-2 years	9 (13.4%)
2-3 years	10 (14.9%)
4-5 years	17 (25.4%)
> 5 years	25 (37.3%)

Table 1 shows that most respondents were male, with as many as 37 respondents (55.2%). The average age of the respondents was 61 years. The most recent level of education is high school (40.3%). Most respondents indicated that the duration of suffering from the disease was > 5 years, 25 respondents (37.3%).

**Table 2. Dependent and independent univariate analysis in CHD patients (N = 67)**

Variable	Mean $\pm$ SD	Min-Max
Medication Adherence	2.61 $\pm$ 2.103	0-8
Self-efficacy	62.72 $\pm$ 7.152	40-75
Family support	53.66 $\pm$ 4.932	38-59

Based on table 2. shows that the average value of the total score of medication adherence is 2.61 (SD = 2.103), the self-efficacy variable shows an average value is 62.72 (SD = 7.152), and family support with an average value of 53.66 (SD = 4.932).

**Table 3. Relationship between age, gender, last level of education, length of illness, self-efficacy, and family support with medication adherence in CHD patients (N = 67)**

Variables	Medication Compliance (Continuous)	
	p.s-value	r/t
Age <sup>a</sup>	0.000	0.416**
Gender <sup>b</sup>	0.814	-0.123
Last Education Level <sup>c</sup>	0.338	1.145
Length of Suffering from Illness <sup>c</sup>	0.004	4,349
Self-efficacy <sup>a</sup>	0.001	-0.406**
Family Support <sup>a</sup>	0.029	-0.267*

<sup>a</sup> Pearson correlation, <sup>b</sup> Independent sample t-test, <sup>c</sup> One-way ANOVA

The results showed that there was a relationship between medication adherence and age with a p-value of 0.000 (<0.05) with a correlation coefficient of r 0.416\*\*, besides that there was also a relationship between duration of illness with a p-value of 0.004 (< 0.05) with a correlation coefficient of r 4.349, self-efficacy with a p-value of 0.001 (< 0.05) with a correlation coefficient of r -0.406\*\*, and family support with a p-value of 0.029 (< 0.05) with a correlation coefficient r -0.267\* with medication adherence.

**Table 4. Linear Regression Test in CHD Patients (N = 67)**

Variable	Unstandardized Coefficients		Unstandardized Coefficients		
	B	std. Error	Betas	Q	p-values
Age	0.070	0.015	0.454	4,770	0.000
Long-suffering from illness	-0.530	0.157	-0.337	-3,381	0.001
Self-efficacy	-0.075	0.031	-0.256	-2,394	0.020
Family support	-0.046	0.044	-0.108	-1.043	0.301

R<sup>2</sup>Square = 0.449 × 100% = 44.9 %

Based on table 4, the results of linear regression obtained a p-value for age 0.000 (< 0.05), duration of illness obtained a p-value of 0.001 (< 0.05), self-efficacy 0.020 (< 0.05), family support 0.301 (> 0.05), as well as the total predictor power for medication adherence with a contribution of 44.9%. Unstandardized Beta results show that if you are getting old, medication adherence increases by 0.070. The longer you suffer from an illness, the better your medication adherence is by -0.530. The better your self-efficacy, the better your medication adherence will be by -0.075. If family support increases, then medication adherence will also increase by -0.046.

## DISCUSSION

The results showed a relationship between medication adherence and age (p-value 0.000). The results of previous studies showed that age and medication adherence had a p-value of 0.000 (p < 0.05). The older a person is, the more problems they experience, especially related to their health condition. The cause is a progressive decline in the whole body's function, such as the easier occurrence of atherosclerosis. The older a person is, the elasticity of blood vessels will decrease, which will result in easy hardening and accumulation of blood vessels, making the heart work harder to

pump blood. Someone who experiences coronary heart disease from early adulthood, middle adulthood, and late adulthood will experience frustration or rejection of their disease so that they will experience disobedience to doctor's recommendations or medication/therapy given by the doctor/medical team (Wongkar, Afford H., Yalume, 2019).

The study's results showed a relationship between medication adherence and the duration of illness. Previous studies' results explained a relationship between duration of illness and medication adherence (p < 0.05). The longer you suffer and undergo treatment, the more experience and knowledge about taking medication or treatment will be better. Most patients are more diligent in treating themselves when suffering from their illness for a long time because their awareness of their disease is high. Hence, patients pay more attention to their health level by exercising control (Tumundo et al., 2021).

The Bivariate analysis results showed a relationship between medication adherence and cell efficacy, with a p-value of 0.001 and a correlation coefficient of -0.406\*\*. Strong self-efficacy from within will affect adherence to medication for the best health status and maintain optimal physical function or abilities. Self-efficacy in

coronary heart patients needs to be focused on the patient's confidence in being able to comply with taking medication that can support the improvement of the disease and maintenance of health functions (21). As for the research results, it was found that medication adherence in CHD patients had high self-efficacy with a median value of 26.00 with a min-max value (of 11-41) (24). Research previously explains a relationship between self-efficacy and adherence to medication; respondents with high self-efficacy tend to learn from experience while undergoing treatment. High self-efficacy will encourage someone to believe in the treatment being undertaken. This belief will motivate and increase a person's hopes for recovery, which ultimately encourages a person to behave obediently during treatment (14).

There is a relationship between medication adherence and family support, with a p-value of 0.029 with a correlation coefficient of -0.267\*. The results of the previous study (5) showed that family support is related to adherence to taking medication. Family support is part of social support that can be given to family members in caring for and improving their health status. Family support functions as a support system for family members. The basic function of the family is the function of health care. The function of health care is the family's ability to care for sick family members, especially adherence to taking medication properly. The results showed a positive and significant relationship between family support and medication adherence. Support from the family, be it spouse, children, or grandchildren, is something that sick family members need. Family support plays an important role in increasing adherence to medication or treatment. Respondents with good family support had better adherence to taking medication than respondents with low-income family support(25).

Based on the results of multivariate linear regression analysis, it was found that age, length of illness, and self-efficacy affected

medication adherence in patients with CHD (CHD). The most dominant factor affecting adherence to taking medication in patients with CHD (CHD) is the duration of suffering from the disease, which has an effect of 0.001 with unstandardized coefficients B - 0.530 being the largest value which means the most significant. The results of previous studies explained that there was a relationship between the length of illness and adherence to taking medication. This research explains that the longer you suffer and undergo treatment, the better your experience and knowledge about treatment or treatment (Rokhayati & Rumahorbo, 2020). The duration of suffering from this disease is associated with the risk of complications. In this study, it is known that most patients are more diligent in treating themselves. When the patient has been suffering from the disease for a long time, the awareness of the disease is higher, so patients pay more attention to their health level by carrying out controls.(26).

## CONCLUSION

The study concludes that there are six factors examined in the study. These factors are age, gender, last level of education, duration of illness, self-efficacy, and family support. The six factors influencing medication adherence are age, length of illness, self-efficacy, and family support. The most influential factor in this study was the duration of illness. Based on the research results, it is hoped that the hospital can build a discussion group for CHD (CHD) sufferers so that patients can freely ask questions if they experience problems of misunderstanding or ignorance of the signs, symptoms, diet, and how to take the correct medicine. In addition to discussion groups, it is recommended that the hospital have a comfortable room so that sufferers can consult medical parties such as pharmacists, nurses, and the nutrition team. Researchers also suggest filling the waiting time, the medical team from the hospital can give presentations or counseling on

everything about CHD, and it should not only be given to sufferers of CHD. The limitation of this research is the small number of samples for multivariate research. For further research, a larger sample size can be added.

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